### Wind Turbine Facility Visits

<table>
<thead>
<tr>
<th>Member:</th>
<th>Scott McElroy and Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Montfort, Wi.</td>
</tr>
<tr>
<td>Date:</td>
<td>July 21, 2007 8:00 PM</td>
</tr>
<tr>
<td>Conditions:</td>
<td>Clear sky, corn fields</td>
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<tr>
<td>Comments:</td>
<td>Scott and his family observed the turbines from several locations. They were as close as 600' and observations were made as far as ½ mile. The low frequency noise created by the blade passing the tower was clearly heard by all from every location. The turbines were rotating at 12 RPM even though it was calm at ground level. No leaves on nearby trees were moving. This condition indicates a temperature inversion and helps explain why the turbines could be heard clearly at ½ mile. A check of local weather conditions indicated 1MPH SSW at Mineral Point and calm at Dodgeville. Wind readings are recorded at 33' (10M). Scott stopped and talked to a farmer and was told he was lucky because they had just turned the turbines on. This would also indicate a temperature inversion. As they were leaving the area they saw emergency vehicles responding to a car accident at an intersection near the turbine field. It is unknown if the rotating blades caused the drivers to be distracted.</td>
</tr>
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| Member:                | Cathy & Jim Bembinster           |
| Location:              | Montfort, Wi.                     |
| Date:                  | August 19, 2007 1:00 PM          |
| Conditions:            | Overcast, low ceiling, corn fields |
| Comments:              | We watched the turbines from several locations. When we arrived the tip of the turbine blades were hidden by the low ceiling. I walked up to the turbine closest to Anderson Rd. and found two pieces of a broken blade. The tip was as big as the hood of our truck. The turbine rotation speed was variable from 14 to 16 RPM. The turbine blade noise was clearly heard even though the corn field was providing a lot of masking sound. The yaw systems were working to keep the blades optimized and it is rather loud. The yaw system sounds like an air-raid siren running at about half speed. Sound measurements were variable between 48 to 53dBA, and 62 to 73 dBC. Wind speed was 7 MPH SW to SSW with gusts to 12 MPH at Mineral Point. Wind speeds were recorded at 33' (10M). |

| Member:                | Cathy & Jim Bembinster           |
| Location:              | Paw Paw II.                       |
| Date:                  | August 25, 2007 10:30 AM         |
| Conditions:            | Partly cloudy, corn fields        |
| Comments:              | We entered the Mendota Hills wind facility from the North. We followed German Rd., Snyder Rd. and Steward Rd., among others. These are Gamesa 880KW turbines and are 214’ tall. They make a distinct buzzing sound. The turbines were rotating at 15 RPM. Wind speed was variable 5 to 7 MPH from the N, NW. Wind speeds were recorded at 33’ (10M). The yaw system is very loud and it seems that one is always turning to catch the most wind. Observations were made from 225 yards to 376 yards both up wind and down wind. At all locations the turbine buzz was clearly heard...At this location the turbines are scattered everywhere so the noise comes from all directions. The interesting thing about Mendota Hills is that most of the homes within the turbine field appear to be abandoned. As we drove thru the area we saw homes with all the windows covered with shades including the garage windows. There is nothing outside these homes to indicate that anyone lives inside. There are no flowers, lawn furniture, garden tools, and no people or |
pets. The out buildings with doors are closed with the windows covered and open buildings are empty. On Snyder Rd, we found a man mowing his grass and we stopped to talk with him. He told us he owned this farm and had 19 turbines on his land. He receives a payment of $4000.00 for each turbine. When I asked him about noise he said they make plenty of noise. I asked about breakdowns and he said they break all the time. During the last storm two turbines had damaged blades. He said they have a warehouse around the corner where they keep the blades, it looks like a house but that's where they store the blades. He told us that after one storm 14' was missing from a blade on his property. He and a few friends looked for this piece for quite some time because he did not want to get it caught in his Combine during the harvest. They never found any parts of that 14' section of blade. He also told us that the new turbines on the South side of this turbine facility were not working because of blade problems. I asked him if he live on the farm and he said he did. This farm looked like the others that appeared to be abandoned. He also said he has had confrontations with local residents that complain about the noise but are unable to move away. As we worked our way South we did see the new turbines and they were not turning.

Cathy & Jim Bembinster
Princeton, Il.
August 25, 2007 2:00 PM
Clear, corn fields
This is the Crescent Ridge wind facility. The turbines are Vestas 1.65MW. These turbines are similar to the one EcoEnergy would like to install in the town of Union. They are 400' tall with the large rotor. We could see these turbines 7 miles away. These turbines sound like you are near a busy airport where the jet aircraft never stop landing or taking off. It must be a combination of the extra height and the larger rotor diameter that makes these turbines sound like jet aircraft. Once again the yaw system is very loud. Winds were 10 MPH with gusts to 17 MPH from the SE. The turbines were rotating at 15 RPM. We took sound measurements from several locations. Upwind at 450' we recorded 58dBA and 76 dBC. At 1000' parallel with the rotor we recorded 52 dBA and 67 dBC. Downwind at 950' we recorded 47dBA and 60 dBC. The wind and the noise from the corn field did not seem to provide the masking sound required to overpower the sound of these large turbines. Again in this area lots of farms and homes look empty or abandoned. We did see a Landscaping Co. crew of three men mowing and trimming at one home. The turbines at this facility are scattered so the noise comes from all directions. Not all of these turbines are turning and we did see three maintenance trucks drive away from one if the inoperative turbines. We were told that these turbines are also having blade problems. These turbines are not able to run at full speed because of cracked blades. Responsibility for replacement of the blades is in litigation.

Jim Bembinster
Wasco, Or
September 22, 2007 11:00 AM
Clear, harvested wheat fields
This is the Klondike I, II, III wind facility in the State of Oregon. The wind was 4MPH gusting to 14 MPH from the WNW.

There are a lot of turbines here probably over 100. They stretch out as far as you can see. These turbines are GE 1.5MW and are 325' tall with a 230' rotor diameter. I could hear the yaw systems working everywhere. This is a very large open area with miles of wheat fields or natural brush. The town is 5 miles away. As far as I can see in all directions there is not one home. About 1 mile away I can see a grain storage building and that is the only building. The turbines here make a lot of noise. There are so many of them it is impossible to single out one and take a sound reading. The sound measurements I took were all 52 to 58 dBA and 67 to 72 dBC. I don't think that this turbine facility would bother anyone. These turbines are responsibly sited away from homes and towns. Unlike
Wisconsin, Oregon does have a wind resource by having the open land and enough wind. This is the facility where a worker was killed when a tower collapsed during routine maintenance in the summer of 2007.

Member: Cathy & Jim Bembinster
Location: Montfort, Wi.
Date: November 9, 2007 8:00 AM
Conditions: Cloudy, harvested corn fields
Comments: When we arrived the shadows from the blades were crossing Anderson Rd. The shadows are so large and travel so fast that they almost seem like a solid object is coming at you, it is very distracting. Winds were 3 MPH gusting to 9 MPH from NNW. The yaw systems are very loud and run often. The corn has been picked now so there is very little to mask the turbine noise. All noise measurements were above 50 dBA and 65 dBC.

Wind Speed Data:

<table>
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<tr>
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<th>MAGNOLIA MET TWR.</th>
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<td>AUGUST</td>
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Wind Turbine Construction May Affect Ground Water Quality:

- **GROUND WATER**: To ensure the protection of surface and ground water resources surrounding a wind project area, the following tests are recommended: Groundwater investigation, survey, fate and impact analysis of identified contaminants relative to identified wells, and wetland impact analysis. Nicholas Pressly Environmental Projects Manager, Pressly & Associates, Inc. Cherry Valley, NY Available at http://otsego2000.org/documents/NikPressleyReport.pdf

- **BLASTING FOUNDATIONS** is a serious issue/problem that may affect drinking well water and damage underwater aquifers: “One of the issues unique to this region (Kewaunee) is contamination of drinking wells. Since the topsoil is so thin, it is possible that fracturing the rock below the soil may allow seepage into the aquifer. This was the reason blasting the holes for the foundation was not allowed. One of the constraints was that the foundations had to be dug without the use of blasting. Workers had to use pneumatic hammers, rather than blasting. Quoted from the PUBLIC SERVICE COMMISSION of WISCONSIN, Wisconsin Wind Power Siting Collaborative, January 26, 1999 minutes.

- The nearly 100 percent increase of road runoff within the project area increases potential contaminant migration into surface water and wetlands resulting from:
  - turbidity (due to land clearing, excavation),
  - pH changes due to concrete spills and infiltration into groundwater
  - road deicing,
  - herbicide use, and
  - dust suppression chemical use.

  Pressly and Associates, Jordanville, NY - SEIS Review

Wind Turbines Create Harmful Shadow Flicker:

- **WES SLAYMAKER**, ECOENERGY, advised a group at the Magnolia Town Board meeting (July 17, 2007) that blade flicker can be observed at ½ mile and maybe further in hilly areas. Wes indicated they Ecoenergy would plant vegetation or provide new window shades/blinds if blade or shadow flicker was a problem.

- **WIND ENERGY HANDBOOK**: A minimum spacing (setback) from the nearest turbines to a dwelling of 10 rotor diameters is recommended to reduce the duration of any nuisance due to light flicker (Taylor and Rand, 1991). (2665 feet for eco-energy proposed project). Wind Energy Handbook, Burton, Sharpe, Jenkins, Bossanyi, Wiley & Sons Ltd, New York, 2001 pg. 527;
• Wind turbines, like other tall structures, will cast a shadow on the neighboring area when the sun is visible. If one lives very close to the wind turbine, it may be annoying if the rotor blades chop the sunlight, causing a flickering (blinking) effect while the rotor is in motion.3

• Wind Engineers Inc. was requested by Zilkha Renewable Energy to evaluate the predicted shadow flicker impacts at the proposed Wild Horse Wind Power Project near Kittitas, WA. The proposed wind project consists of 136 wind turbines at 65-meter hub height [213 feet]. Because the distance between the turbines and residences is larger than 1,000 meters [3,280 feet], there were no significant impacts at any of the residences.4

• After the wind turbines went online in Kewaunee County, Wisconsin, the Lincoln Township board of supervisors approved a moratorium on new turbine construction. The purpose of the moratorium was to delay new construction of wind turbines for 18 months, giving the township the opportunity to assess the impacts of the 22 turbines installed by Wisconsin Public Service Corporation and Madison Gas & Electric in June 1999.3

• Thirty-three percent of survey participants living between 800 feet and 1,320 feet from a wind turbine said that shadow flicker was currently causing a problem in their household.3

• Forty-one percent of survey participants living between 1,320 and 2,640 feet from a wind turbine said that shadow flicker was currently causing a problem in their household.3

• Since a new rule about calculation of shadow impact, which states that the calculation should be made for the building lot (garden), instead of window, has been introduced by the Swedish building authority (Boverket), the time for shadow impact in Klintehamn has been calculated for both lot and façade. There is a statistically significant moderate connection between shadow minutes/day on façade and annoyance. Wind Power Environmental Impact of Wind Power Station Siting,(VINDKRAFTENS MILJÖPÄVERKAN FALLSTUDIE AV VINDKRAFTVERK I BOENDEMILJÖ), A. Widing et al, Centrum för Vindkraftsinformation Institutionen för naturvetenskap och teknik, Gotland University, Sweden, 2004.

• Shadow flicker can be mitigated by siting wind turbines at sufficient distance from residences likely to be affected. Flicker effects have been proven to occur only within ten rotor diameters of a turbine. Therefore if the turbine has 80m diameter blades, the potential shadow flicker effect could be felt up to 800m from a turbine. (2000) Planning for Renewable Energy, A Companion Guide to PPS22, Office of Deputy Prime Minister; Queen’s Printer and Controller of Her Majesty’s Stationery Office, 2004.

• On a sudden there is no connection between calculated duration of shadow impact and annoyance. There is however a moderate strong connection between the distance to the closest turbine and annoyance from shadows. This could indicate that the geometrical model for shadow impact calculation is not accurate when there are several turbines at large distances from a building, since the shadow impact from distant turbines are included, although the shadows, according to a recent study, have a maximum extension of approximately 1 km (.67 miles) (Freund 2002):

• Three things can prevent a turbine from casting a flickering shadow: a cloudy day, a windless day and the orientation of the turbine to the home, Slaymaker said. During the siting process, EcoEnergy uses a model to determine the annual maximum hours shadow flicker could be cast on a residence. There are no requirements for the maximum theoretical hours, but EcoEnergy tries to stay below 100 hours annually, Slaymaker said. In the EcoDane project, the maximum theoretical number turned out to be less than 75 hours; he said. Homes within a half-mile were computed to have shadow flicker from fewer than 10 hours to 20-plus hours, he said. Because the siting process includes public input, plans can be modified to address serious concerns, he said. (Wes Slaymaker, Ecoenergy, Janesville Gazette, Monday November 26, 2007).
Shadow Function
Calculation and documentation of flickering effects in terms of hours per year during which a neighbor or an area would be exposed to flickering from nearby WTG rotors. Also maximum minutes per day are calculated. SHADOW can calculate the Worst Case results (sun always shining in daytime, WTG always rotating and wind direction "worst case") or the "real expected values", based on assumptions on solar statistics and operating hours divided by wind direction.

Calculation model
Calculations can be made either for a set of shadow recipients (e.g., windows) or for a user-defined area. The calculation engine then performs a complete simulation of the sun path throughout a whole year in user-definable time steps. The size and orientation of shadow recipients as well as the raster size for an area calculation can be freely chosen. Results are presented in form of calendars, cumulated hours with flicker or - for the area calculation - as maps of flicker hour isolines. If a digital height contour map is available, the terrain levels can be taken into consideration.

Necessary Input Data (objects)
Please note that the objects are entered in the WindPRO module BASIS. Please read the description of the WindPRO module BASIS for further details.

Wind Turbines (WTGs):
One or more WTGs are entered (position and type). The WTG can normally be found in the WTG catalogue, which contains more than 500 different WTG types. The hub height and rotor diameter are used in the calculation.

Shadow recipients:
The shadow recipients are positioned where a calculation of the potential shadow impact is required. As many shadow recipients as needed can be included in the same calculation.

Description
The WindPRO module SHADOW for shadow impact calculation makes it possible to calculate the annual hours of shadow impact for a given area which one or more wind turbine rotors generates. A worst-case calculation based on worst weather conditions or real values (statistic values) can be calculated based on entered solar statistics and operating hours per wind direction sector. The latter can even be auto-calculated when energy calculation data are present. At present, there are often no exact rules regarding the allowable amount of shadow impact hours, but documentation has been required in several cases. Also, a shadow impact calculation can be used for constructive discussions with neighbors during the planning stage of a project. Often, even small adjustments in the siting of the turbines can change the level of shadow impact from unacceptable to acceptable.

Calculation report
The calculation report includes the following four printout options:
Main printout: Prints the main assumptions including a map segment showing the positions of
WTGs and the shadow recipients. For each shadow recipient, the potential amount of hours with shadow impact is printed.

**Calendar (tabular and graphic):** for receptors: Shows the exact days, the time of the day, the duration and origin of possible shadow impact. At the bottom line for each month, the deduction due to solar statistics and operating hours will appear. The graphic version shows the impact of the shadow clearly arranged for intuitive understanding.

**Calendar (tabular and graphic):** for the turbines: These are calendars giving the date, time and duration for the flickering caused by each turbine. This is useful for planning if and when to stop the turbines to protect against flickering.

**Map:** A map with isolines for potential shadow impact is plotted for areas with WTGs. This way it is possible to reveal the extent of the possible shadow nuisance, e.g. for areas where future development is planned. The user can adjust the values of the isolines to be printed, the line colors and the line widths. Also map with raster graphic showing the values by color scheme is available. Height contour levels can be taken into account when calculating the map.

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**Wind Turbines are Capable of Throwing Ice /Parts at Dangerous Speeds and Distances:**

- **ACCIDENTS:** Summary of Wind Turbine Accident data to December 31st, 2006. These accident statistics are copyright Caithness Windfarm Information Forum 2006. The data may be used or referred to by groups or individuals, provided that the source (Caithness Windfarm Information Forum) is acknowledged and our URL www.caithnesswindfarms.co.uk quoted at the same time. Caithness Windfarm Information Forum is not responsible for the accuracy of Third Party material or references.

- The attached data includes all documented cases of wind turbine related accidents which could be found and confirmed through press reports or official information releases up to December 31st, 2006. The wind industry is extremely reluctant to make such data available to the public, and because of this, data has been extremely difficult to obtain. Several Consultants from the UK and US wind industry have confirmed difficulty in obtaining such data, and CWIF believe that this compendium of accident information may be the most comprehensive put together to date.

- Data obtained in the report is by no means comprehensive - it includes little data from Denmark and Holland - two of the biggest wind turbine operators in the world. However, the data gives an excellent cross-section of the types of accidents which can and do occur, and their consequences. It is noticeable that since about 1999/2000 data has been easier to find - presumably since the wide distribution of media via the Internet. Numbers of accidents in the data reflect this, with an average of 33.6 accidents found per year from 1999 to 2006 inclusive, and only an average of 5.4 accidents found per year in the previous nine years (1990-1998 inclusive). With few exceptions, before about 1997, only data on fatal accidents has been found. **Total number of accidents recorded is 327.** Data attached is presented chronologically. It can be broken down as follows: Fatal, Human Injury, Blade Failure, Fire, Structural failure, Ice Throw, transport, Environmental Damage, Other. **Caithness Windfarm Information Forum**

- **GENERAL ELECTRIC,** a leading manufacturer of wind turbines, recognizes that the risk of ice throw must be taken into account during both project planning and wind farm operation. To mitigate these risks, GE recommends locating turbines a safe distance from any occupied structure, road, or public use area. In the absence of a site-specific assessment, GE offers the formula of 1.5 x (hub height + rotor diameter). In addition, GE recommends a setback of no less than 1,000 feet from inhabited structures, road, or other type of access. 9 This equals 762 feet of proposed turbine.

- **SEARSBURG VERMONT:** During a windstorm in Searsburg Vermont there was a lightning strike that caused a turbine blade to fall off - the largest piece, weighing 20 pounds - was found **250 feet away**
from the tower. The smallest piece was found one thousand feet from the tower.” Remarks Delivered To The Assembly Committee On Energy And The Subcommittee On Renewable Energy, Examining Policy and Implementation Plans For the RPS Program, March 7, 2006 by Ad Hoc Coalition Of Local Community Groups In Upstate New York http://www.windwatch.org/documents/1913

In an article written in January 1996 Professor Otfried Wolfrum, professor of applied geodesy at Darmstadt University, wrote of a significant number of blade failures in Germany, detailing four particularly severe ones where fragments of blade weighing up to half a tonne were thrown up to 280 m. Professor Wolfrum wrote: Apart from the danger of blades becoming detached or disintegrating, there is a risk that lumps of ice can form, and then be thrown significant distances when the wind rises and the blades begin to move. “Some ice layers 150mm thick have been detected and their mass has been as high as 20 – 23 kg/m”. He demonstrated that these fragments could travel up to 550 m and land with impact speeds of 170 mph. This has led to “Falling Ice” warning notices at some wind turbine sites. Proceedings BORKAS 11, Helsinki, 1994, p219) http://www.aandc.org/research/wind_pae_present.html

Broken blades: When they have broken off they have planed up to 400 metres (1200 feet) (9 Dec 1993, Cemmaes, Wales). At Tarifa, Spain, blades broke off on two occasions in Nov. 1995 – the first in gusty, high winds, the second in only light wind (report, Windpower Monthly, Dec. 1995). http://www.aandc.org/research/wind_pae_present.html http://www.physics.rutgers.edu/~matilsky/

April 2000, three UK wind farms were reported as being closed for safety reasons, apparently because of metal fatigue in the turbine towers. The sites in question are at Cold Northcott in Cornwall and Cemmaes and Llangwyryfon in Wales. <http://www.windfarm.fsnet.co.uk/brecon.html> and http://www.landskapsskydd.nu/vind/vind035.htm

Professor TERRY MATILSKY, Department of Physics and Astronomy, Rutgers University actually calculated the potential distance of ice throws at up to one half mile. “But it seems like it would be quite reasonable to take about one half mile as the canonical number for the maximum range of a projectile launched with the above wind turbine parameters.”10 http://www.physics.rutgers.edu/~matilsky/

Professor TERRY MATILSKY, Department of Physics and Astronomy, Rutgers University: I have come to believe that blade throw is more of an issue than ice throw, and there, the likelihood of say, a half mile range, is quite possible, since the blades are designed to “fly”. Also, note that the turbines will NOT necessarily shut down when ice accumulates on the blades. Rime ice coats the blades uniformly so that the blades tend to keep spinning. There has even been acknowledgment of this (rarely) by the developers, but they still insist that it is not a problem, although they cannot provide any evidence of this being the case. I am not sure that even 1/2 mile setbacks will be adequate. 500 feet would be an impossible situation; I guarantee that. 1350 meters (4429 feet) seems like a good compromise, considering everything we know at this point (November 8, electronic mail communication.)

In Germany, in 2003, parts landed 1,650 feet from a wind-tower base after brakes failed in high winds and a blade hit the tower. http://www.pbase.com/wp/wind_turbine_photos&.page=1


American Wind Energy Ass’n: Pieces of ice falling from blades vary in size from tiny to hundreds of pounds. American Wind Energy Ass’n correspondence, page 35.

SIMONE KAISER and MICHAEL FRÖHLINGSDORF: The Dangers of Wind Power: Many insurance companies have learned their lessons and are now writing maintenance requirements requiring wind farmers to replace vulnerable components such as gearboxes every five years -- directly into their contracts. Gearbox replacement can cost up to 10 percent of the original construction price tag, enough to cut deep into anticipated profits. Indeed, many investors may be in for a nasty surprise. "Between 3,000 and 4,000 older facilities are currently due for new insurance policies," says Holger Martsfeld, head of technical insurance at Germany’s leading wind turbine insurer Gothaer. "We know that many of these facilities have flaws." Flaws And Dangers And the technical hitches are not without their dangers. For example: In December of last year, fragments of a broken rotor blade landed on a road shortly before rush hour traffic near the city of Trier. Two wind turbines caught fire near Osnabrück and in the Havelland region in January. The firefighters could only watch: Their ladders were not tall enough to reach the burning casings. "The same month, a 70-meter (230-foot) tall wind turbine folded in half in Schleswig-Holstein -- right next to a highway." The rotor blades of a wind turbine in Brandenburg ripped off at a height of 100 meters (328 feet). Fragments of the rotors stuck into a grain field near a road. At the Allianz Technology Center (AZT) in Munich, the bits and pieces from wind turbine meltdowns are closely examined. "The force that comes bear on the rotors is much greater than originally expected," says AZT evaluator Erwin Bauer. Wind speed is simply not consistent enough, he points out. "There are gusts and direction changes all the time," he says. But instead of working to create more efficient technology, many manufacturers have simply elected to build even larger rotor blades, Bauer adds. "Large machines may have great capacity, but the strains they are subject to are even harder to control," he says. Even the technically basic concrete foundations are suffering from those strains. Vibrations and load changes cause fractures, water seeps into the cracks, and the rebar begins to rust. Repairs are difficult. "You can't look inside concrete," says Marc Gutermann, a professor for experimental statics in Bremen. "It's no use just closing the cracks from above." The engineering expert suspects construction errors are to blame. "The facilities keep getting bigger," he says, "but the diameter of the masts has to remain the same because otherwise they would be too big to transport on the roadways." September 10, 2007, (New York Times) WUTHERING HEIGHTS

The Problem -it's not a Winter Wonderland

- Ice is an issue
- Site assessment and monitoring
- Higher maintenance
- Increased downtime
- Higher loading on components
- Increase safety risks for staff and the public

And it's more common than most people think

Projects located throughout the North from the Pacific to the Atlantic are in areas where ice, snow, and cold temperatures can impact the assessment and operation of wind plants. In all cases these impacts should be assessed at the start of the project, accounted for in project development and supported through long term assessment and consideration.

Icing Events

It is not enough to know if icing occurs, you need to know when, how much and how long it will last. Because icing events will impact:

93
Turbine structural loads
Forced downtime
Energy capture
Increased and more difficult maintenance
Higher project risk
Site accessibility
Cost of ice mitigation strategies
(NREL National Renewable Energy Laboratory).

Wind Turbine Health and Safety Lawsuit Settlement:

- Case Number: 02CV55; plaintiffs: Mike Washecheck, Nancy Larson, Ken Loeber, and Dona Look; defendant: Wisconsin Public Service Corporation (WPS).

  Facts:
  - In 1999, WPS obtained conditional use permits from the Town of Lincoln in Kewaunee County, for the construction of wind turbines. The wind turbines were constructed near the plaintiffs residences and could easily be seen and heard. The WPS turbines have caused strobe light/shadow effects and noisy conditions.
  - In 2001, WPS purchased several nearby residential properties that were similarly affected. After purchasing these properties, WPS removed the residences and other buildings and has since maintained the properties as vacant, open land.
  - In 2001, WPS made a purchase offer to the plaintiffs, which they rejected. WPS later offered a settlement to end the lawsuit.

Other Legal Issues/Cases Related to Wind Turbines Ruled a "Nuisance":

- In a 2007 West Virginia Case, the court allowed a private nuisance claim against a wind development to proceed without yet deciding specific issues. Burch v. Nedpower Mount Storm, LLC, No. 33201, slip op. (W.Va. June 8, 2007) (not published yet)

- A court ruled Noise may constitute a private nuisance if it interferes with health and safety and comfort of ordinary people in the area. Alois Valerian Gross, Annotation, Windmill as Nuisance, 36 A.L.R.4th 1159 (1985)
In a 1982 New Jersey case, the turbine was held to be a nuisance because, among other factors, it produced a distinctive sound that exceeded the limits set by the local zoning ordinance. Rose v. Chaikin, 453 A.2d 1378, 1384 (N.J. 1982)


Financial Compensation Paid to Residents Living near Wind Turbines Neighbor Easement Agreements:

- INVENERGY: who has developments in Wisconsin and Michigan, makes it a standard practice to financially compensate people living within one-third mile of their wind turbines: Invenergy, the developer for the Summit Ridge wind farm project, has been paying residents living within one-third mile of turbines at the company's other wind farm projects and often pays homeowners who live near its turbines $600 to $1,000 per year in compensation, says Invenergy's senior development manager, Joel Link. Under Invenergy's compensation plan, property owners who live within one-third of a mile of one turbine would receive $500 per year, while property owners who are within one-third mile of two turbines would receive $750 annually.

- INVENERGY: Chicago-based Invenergy will pay landowners who are within one-third mile of turbines, under a proposal accepted by town boards in Byron and Oakfield in Fond du Lac County. Under Invenergy's compensation plan, property owners who live within one-third of a mile of a turbine would receive $500 a year, while property owners who are within one-third of a mile of two turbines would receive $750 annually, he said. Landowners who host a wind turbine will receive easement payments of about $4,200 a year, as well as compensation for crops they would not be able to sell because of the easement. Invenergy's decision to pay property owners who don't host turbines was praised by Michael Vickerman, executive director of the non-profit group Renew Wisconsin, which advocates for greater use of renewable power. "Renew has been encouraging wind developers to channel wind power's economic benefits to a broader group of landowners in the area of wind farms," Vickerman said in a statement. Invenergy's decision sets the standard for other Wisconsin wind developers. "Wind power projects can be controversial in part because neighbors who don't have a wind farm on their property have to look at the turbine and know that their neighbor is enjoying a financial gain by selling easements to host the wind farm. Already the largest wind power project in state history, the Forward Wind Energy Center, this week chalked up another first: It will become the first wind development to compensate property owners who have to look at wind turbines but haven't sold easements to put them on their land. Posted: Oct. 27, 2005 Milwaukee Journal Sentinel: http://www.windaction.org/documents/11985"

- ZILKHA Renewable Energy 1001 McKinney Street, Suite 17-40, Houston, Texas 77002 uses a "Memorandum of Wind Farm Neighbor Easement agreement" and pays non participating neighbors $500.00 in compensation if they reside within 2500 feet of a wind turbine. Copy available upon request. http://www.windaction.org/documents/11985

- LEMPSTER WIND LLC.: "Lempster Neighbor Agreement." Lempster WIND LLC., a Delaware Limited Liability Company, c/o Iberdrola Renewable Energies USA, Ltd., 201 King of Prussia, Suite 580 Radnor PA 19087. Lempster pays non participating landowners $1,000.00 up front and $1,000.00 per year to waive all noise, setbacks, construction inconvenience, etc. for 30 years. http://www.windaction.org/documents/11985

- MERIDIAN ENERGY paid an undisclosed sum of money to the Bolton Family in August 2005 due to intolerable noise and vibration levels created from wind turbines.

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AIRTRICITY Inc.: North America, headquartered in Chicago, 401 North Michigan Avenue, Suite 1720 Chicago, IL 60611. Local landowners are being asked to sign contracts stating: "(X) hereby accepts such nuisance and waives their right to object to such nuisance." Airtricity contract, clause 9, page 10. Meredith Comprehensive Plan, 2006, final draft, p. 7 Presented February 6, 2006, To the Town of Meredith Planning Board by Kenneth Jaffe, MD

BP WIND ENERGY NORTH AMERICA Inc. BP Wind Energy North America Inc. 700 Louisiana Street, Suite 700 Houston, TX 77002. This is a 23 page contract where several items are "waived" as part of the agreement. The document is marked "Confidential" throughout...http://www.windaction.org/documents/11774

HAYS WIND LLC, a Delaware limited liability: "Wind Farm Neighbor Agreement" This Wind Farm Neighbor Agreement ("Agreement") is entered into as of the date set forth below, between (i) Hays Wind LLC, a Delaware limited liability company authorized to do business in the State of Kansas ("Hays Wind") and solely owned by Iberdrola Renewable Energies USA. The agreement contains language included but not limited to: Noise Easement, Light and Shadow Easement, Television reception, Construction Impact, miscellaneous, and Confidentiality requirement. Payments are as initial sum paid in the amount of $3,000.00: Then annual payments based on electrical usage. Term is for 35 years. http://www.windaction.org/documents/11807

Elroy Swope, age 75, has four windmills on his Compton farm that are part of Mendota Hills project in Lee County. Elroy Swope, states: "I wouldn't do it again," "It just didn't turn out the way it was supposed to." Swope said he was told he would receive about $1,000 per year per windmill, but after one year, he has not received anywhere near $4,000. He declined to say how much he has been paid. "Mr. Swope is a difficult person to keep happy," said Christopher Moore, managing director of the Minneapolis, MN based developer Navitas Energy, Inc. Still, Moore acknowledged that farmers were not paid as much as they expected in 2004. "2004 was a poor wind year and because it was the first facility, the first part of the year was what I would call startup. We didn't get as much production as we hoped." 2005 was better, but Moore declined to provide statistics about the wind farm's production in 2005, and has not responded to multiple voice messages and e-mails requesting this information. http://www.protectillinoisenvironment.com/quotes.htm gave it's OK to a Milwaukee-area company's request for a conditional use permit to build an eight-turbine wind farm.

Shirley Wind LLC of Hubertus, a division of Emerging Energies, wants to build eight 492-foot-tall turbines on several parcels of property owned by four families in Glenmore. The sites on land owned by Mark Mathies, 3982 Fairview Road; Dan Mathies, 4157 Shirley Road; Dan and Tina Zeamer, 3384 School Road; Rodney and Sue Leiterman, 4611 Shirley Road; and several parcels on Glenmore Road. Each landowner requested permission for two turbines on their property. Shirley Wind would give more than $2.1 million to Brown County, Glenmore and homeowners within one mile of the project over the 30-year tenure of the project. The homeowners – about four or so – would stand to receive a total of $900,000 combined over 30 years, distributed equally as a "good neighbor gesture," said representatives of Shirley Wind. But those who live nearby but not within a mile stand little to gain and everything to lose, said resident Jeffrey Jens of 6187 Dickinson Road. "I'm sick of them shoving this down our throat," he said, adding that he intends to voice his discontent at the Feb. 26 public hearing. Jens was among a group of residents who said they felt their property values would plummet. In February 1998, two 600-kilowatt turbines were built on a farm on Shirley Road, a quarter-mile east of Morrison Road in Glenmore, at an installation cost of $2.1 million. The experimental, two-turbine project was intended to provide enough clean, renewable electricity to serve about 450 average Wisconsin homes a year. At least one of the turbines has been out of order for several months, residents said. Jens said that contrary to Shirley Wind representatives' claims that the 24-kilowatt project would produce less sound than an average conversation, the two turbines in Glenmore are noisy. "It's not nice to have to open your door and hear that all of the time," he said. The matter will go to the Town Board for final decision on March 5. By Lee Reinsch, lreinsch@greenbaypressgazette.com
Precedence for Larger Setbacks:

- As seen in Figure 1, Invenergy's setbacks for the Beech Ridge Wind Farm located in West Virginia are between one and four miles from residences. "At a distance of 1,000 feet, most potential negative impacts of wind turbines are significantly reduced. At a distance of one mile, these impacts are no longer a legitimate concern."13 Figure 1: Beech Ridge Energy Project Details

![Beech Ridge Energy](image)

- National Wind Power, a company that builds turbines, recommends that they are erected at least 600 yards (1800 feet) from human habitation. January 25, 2004
  [Home: http://www.natwindpower.co.uk/homepage/index.asp](http://www.natwindpower.co.uk/homepage/index.asp)

- German Turbine Company RETEXO-RISP, Altenburger Str. 31 D-04617 Rositz /Thuringian since 1994, recommends turbines be built on coastal sites, on open land without forests or high hills within a range of about 15 km and, of course, on hill tops. Buildings, particularly

  - housing, should not be nearer than 2 (1.24 miles) km to the wind farm. Available at: http://www.retexo.de/english/wind/seite5a.htm

- British Wind Energy Association (BWEA): When asked about siting a 400 foot wind turbine near residences, David responded: "Different developers use different distances. We would typically site them 700 metres (2296 feet) from the nearest residence. David Farrer, Renewables Development Manager, British Wind Energy Association. Received in an electronic mail 10-24-08.

- The National Wind Coordinating Committee in depth case study on: Blue Canyon Comanche County, Oklahoma Wind Facility is located approximately 15 miles northwest of Lawton, Oklahoma, in Comanche County, Comanche County has a population of about 113,900 people. Noise was addressed primarily through community outreach efforts. The only landowner living in the vicinity of the turbines (one-half mile away) was sent to a wind farm in Texas to observe how an operational site looks and sounds, and he told the NWCC's interviewer that he has no complaints about the noise and that he considered the turbines to be relatively quiet. Wind Power Facility Siting Case Studies: Community Response For the National Wind Coordinating Committee, c/o RESOLVE, 1255 23rd Street, NW Suite 275 Washington, DC 20037. [http://www.nationalwind.org/publications/siting/Wind_Power_Facility_Siting_Case_Studies.pdf](http://www.nationalwind.org/publications/siting/Wind_Power_Facility_Siting_Case_Studies.pdf)

- Second International Meeting On Wind Turbine Noise

Lyon France September 20 -21 2007
Conclusions

Sound generated by wind turbines has particular characteristics and it creates a different type of nuisance compared to usual urban, industrial, or commercial noise. The interaction of the blades with air turbulences around the towers creates low frequency and infrasound components, which modulate the broadband noise and create fluctuations of sound level. The low frequency fluctuations of the noises described as "swishing" or "whooshing" sound, creating an additional disturbance due to the periodic and rhythmic characteristic.

A set of permissible limits for windmill noise that can be uniformly applicable over the nation is not available in the USA. Instead of imposing standard noise limits, the US Environmental Agency (US-EPA) suggests local governments developing their own noise regulations or zoning ordinances. Many countries developed national noise limits applicable to wind turbines.

Specific noise limits need to be developed by considering the characteristics of wind turbine noise. Especially the low frequency sound components and the modulation of the background noise resulting must be considered to represent the activity interference of the wind turbine sound. Adequate criteria to assess the wind turbine sound will greatly help the development of the wind industry by reducing the community reaction based on subjective opinions.

<table>
<thead>
<tr>
<th>Organization/country</th>
<th>Setbacks from Residences</th>
<th>Mile(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Research Council; USA</td>
<td>Past ½ mile or so</td>
<td>½ +</td>
</tr>
<tr>
<td>France National Academy of Medicine</td>
<td>1.5 KM</td>
<td>.93 mile</td>
</tr>
<tr>
<td>Burton, Sharpe, Jenkins, Bossanyi (Authors), Wind Energy Handbook, Wiley &amp; sons LTD, 1991</td>
<td>10 rotor Diameters × 2,665 feet</td>
<td>½ +</td>
</tr>
<tr>
<td>Holland</td>
<td>1 KM</td>
<td>.62 mile</td>
</tr>
<tr>
<td>UK Noise Association</td>
<td>1 mile</td>
<td>1 mile</td>
</tr>
<tr>
<td>Scotland</td>
<td>½ mile</td>
<td>½ mile</td>
</tr>
<tr>
<td>RETEXO-RISP: German Turbine developer</td>
<td>2 KM</td>
<td>1.24 miles</td>
</tr>
<tr>
<td>Germany</td>
<td>1600 meters or 1.6 KM</td>
<td>1 mile</td>
</tr>
<tr>
<td>Riverside County, CA</td>
<td>2 miles</td>
<td>2 miles</td>
</tr>
<tr>
<td>Town of Wilton, WI</td>
<td>1 mile</td>
<td>1 mile</td>
</tr>
<tr>
<td>Professor Terry Matisky; Rutgers</td>
<td>1350 meters/4429 feet</td>
<td>.838 miles</td>
</tr>
<tr>
<td>Dr. Amanda Harry</td>
<td>1.5 miles</td>
<td>1.5 miles</td>
</tr>
<tr>
<td>Dr. Nina Pierpont (Physician)</td>
<td>1.5 - 3 miles</td>
<td>1.5 - 3</td>
</tr>
<tr>
<td>Dr. Richard Bolton (Physicist)</td>
<td>1 mile</td>
<td>1 mile</td>
</tr>
<tr>
<td>Dr. Gordon Whitehead (Audiologist)</td>
<td>1.5 miles</td>
<td>1.5 miles</td>
</tr>
<tr>
<td>Barbara Frey &amp; Peter Hadden</td>
<td>2 km</td>
<td>1.25 miles</td>
</tr>
</tbody>
</table>

*Source: http://windwisefairhaven.com/  
** Germany, which has more wind turbines than any country in the world, has a 1.6 km or 1 mile
setback for all turbines. These regulations are for one or more turbines. The proponents of wind turbines will try to attack this data by saying that they are for wind farms. Go to google: wind turbine setbacks. WE NEED TO DO THIS PROJECT THE RIGHT WAY-OR NOT DO IT AT ALL.

Summary on Health Issues From Dr. Nina Pierpont

**Wind Turbine Syndrome** is the clinical name I have given to the constellation of symptoms experienced by many (though not all) people who find themselves living near industrial wind turbines: sleep problems (insomnia), headaches, dizziness, unsteadiness, nausea, exhaustion, anxiety, anger, irritability, depression, memory loss, eye problems, problems with concentration and learning, tinnitus (ringing in the ears).

As industrial windplants proliferate close to people's homes and anywhere else people regularly congregate (schools, nursing homes, places of business, etc.), **Wind Turbine Syndrome** likely will become an industrial plague.

Wind energy companies routinely deny that their 40-story-high turbines, with massive propellers sweeping acres of air, make any noise or create shadow flicker, or strobing—caused when the sun is positioned behind the blades, resulting in acres of landscape being swept by blade shadow. With setbacks from homes being typically a quarter mile, even half a mile, or even up to a mile, these pulsed shadows "strobe" through the windows of one's home and drive people to distraction. (Not to mention what they do when you walk outside and see your landscape seemingly moving before your eyes.) Many people get vertigo and nausea. Anyhow, the wind energy companies deny noise and shadow flicker, yet they discreetly insert clauses in their contracts acknowledging them.

Q. Are there health and safety issues associated with living close to industrial wind turbines which I should be concerned about?

Here is the October 10, 2007 response to this question by Dr. Nina Pierpont, MD, PhD, who has conducted some of the most intensive medical studies on the effects of wind turbines on human health and safety: "Yes, there are indeed medical problems caused by noise and vibration from current, upwind, three bladed industrial wind turbines. I am in the process of preparing a paper for publication in a medical journal documenting the consistency of these problems from family to family, the study subjects being a collection of families in several different English-speaking countries who have been driven from their homes by problems with sleep, headaches, tinnitus, equilibrium, concentration, memory, learning, mood, and child behavior—problems which started when the turbines went into operation and which resolve when the family is away from the turbines. These problems all occur in proximity to recently built industrial turbines, put into operation in 2005, 2006, and 2007. The ear is indeed the most sensitive receptor for noise and vibration. This does not mean, however, that if you cannot hear it, it cannot hurt you. The ear does more than hear. A number of the effects of noise and vibration from wind turbines appear to be mediated by the inner ear, which is a complex organ, one of whose functions is detecting certain sorts of vibration as noise. The inner ear also detects movement, acceleration, and position relative to gravity, has direct feedback onto eye movement, and has established linkages with anxiety centers in the brain. People disturbed by noise and vibration from industrial wind turbines generally can hear the noise when it bothers them, though it may not seem particularly loud. Several people I have interviewed speak favorably of living next to an elevated urban train line, compared to living at their rural home next to wind turbines. They can sleep with traffic or train noise, but not with the wind turbine noise/vibration. They consistently described a penetrating and intrusive quality to the wind turbine noise, several describing in different ways a very disturbing feeling that the noise is somehow inside their bodies. This latter effect suggests detection of vibration in body cavities, especially since people who say this generally localize the feeling to their chest or their head. Published research from Sweden (thesis by Pedersen and published papers incorporated into the thesis) shows that the percentage of annoyed people (which include people who move out or undertake major house renovations to try to do something about the noise) goes up at 37.5-40 dBA. This is probably because A-weighted noise representations are not capturing the parts of the wind turbine noise and vibration spectrum which are disturbing. The Pedersen studies are also based on modeled noise, not actual measurements, though there is a close correlation between actual dBA measurements and the Swedish governmental modeling protocols, the author says. Even if we do not know exactly what parts of the noise and vibration
spectrum are bothersome, and to what extent these are represented in a dBA measurement, we have in the Pedersen research clear evidence that when noise is modeled prior to wind turbine construction, the allowed levels of noise should not be over 37.5 to 40 dBA outside of dwellings. Because the noise level is especially important at night, and it is at night that there tends to be a "stable atmosphere," with cool, still air at ground level and a brisk wind at turbine hub height, modeling of noise prior to wind turbine construction should use both a 37.5 to 40 dBA ceiling of tolerability, and van den Berg's models of noise propagation in a stable atmosphere.

Sincerely,

Nina Pierpont, MD, PhD

My conclusions:

I am a physician and scientist; my expertise lies in clinical and environmental matters. Whether or not wind proves to be a viable source of power, it is absolutely essential that windmills not be sited any closer than 1.5 miles from people's homes or anywhere else people regularly congregate. (Highways are also a problem for motorists with seizure and migraine disorders and motion sensitivity, from the huge spinning blades and landscape-sweeping shadow flicker.) I consider a 1.5 mile set-back a minimum figure. In hilly or mountainous topographies, where valleys act as natural channels for noise, this 1.5 mile set-back should be extended anywhere from 2-3 miles from homes. Let me be clear: there is nothing, absolutely nothing, in the wind energy proposition that says windmills must be sited next door (often 100 feet) to people's homes and workplaces. Siting, after all, is the crux of the issue. Irresponsible siting is what most of the uproar is about. Corporate economics favor building wind turbines in people's backyards; sound clinical medicine, however, does not.

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pierpont@westelcom.com
www.ninapierpont.com
July 5, 2006

Professional Recommendations Substantiating Larger Setbacks:


- **The FRENCH NATIONAL ACADEMY OF MEDICINE** recommend halting wind turbine construction closer than 1.5 km (.932 miles) from residences. Chouard, Claude-Henri, 2006, <Le retentissement du fonctionnement des éoliennes sur la santé de l'homme> ("The repercussions of wind turbine functioning on human health"), Académie Nationale de Medicine (French National Academy of Medicine).
THE WORLD HEALTH ORGANIZATION (WHO) recommends that threshold standards for noise in communities be set lower than 30dB (as measured with the standard "A" filter) whenever the noise has a substantial low-pitched component—as it does from wind turbines. Again, this is because low-pitched noise is more disturbing and has a greater impact on health at low levels than higher-pitched noise. When measuring such noise, a "C" filter will give a more accurate reading of loudness by including more of the low-frequency sounds.

- **Centerville Mi Township Windmill Ordinance Committee, July 10, 2006:** Setback from residence should be ten times the rotor diameter (2665 feet for eco-energy proposed project). "A minimum spacing from the nearest turbines to a dwelling of 10 rotor blades diameters is recommended to reduce the duration of any nuisance due to light flicker (Taylor and Rand, 1991). However, a spacing of this magnitude is likely to be required in any event by noise constraints and to avoid visual domination." This is cited verbatim in Wind Energy Handbook, Burton, Sharpe, Jenkins, Bossanyi, Wiley & Sons Ltd, New York, 2001 pg. 527;

- **WIND ENERGY HANDBOOK:** A minimum spacing (setback) from the nearest turbines to a dwelling of 10 rotor diameters is recommended to reduce the duration of any nuisance due to light flicker (Taylor and Rand, 1991). However, a spacing of this magnitude is likely to be required in any event by noise constraints and to avoid visual domination. (2665 feet for eco-energy proposed project). Wind Energy Handbook, Burton, Sharpe, Jenkins, Bossanyi, Wiley & Sons Ltd, New York, 2001 pg. 527;

- The **CATHARINE M. LAWTON:** "Wind turbines should not be sited anywhere near (closer than 2+ miles) residential development." (Catherine M. Lawton, Town of Barton, Washington County, Wisconsin: Commercial Wind Energy Facility, & Wind Access Model Ordinance)

- **AUDIOLOGIST GORDON WHITEHEAD:** 23 May 2006 Report on Pubnico Point Wind Farm, Lower West Pubnico, Nova Scotia, states: I believe a setback equivalent to 1.5 miles would be adequate in most situations, and I think in most situations a setback of this distance is possible. The potential noise, and/or vibration, and/or light flicker and/or mechanical safety issues are very real. You mentioned that in one area the windfarm site is 549 feet from a highway. It has been documented that the turbine blades can throw ice chunks weighing hundreds of pound at least 1,650 feet; this is certainly enough to destroy a school bus and the children in it, not to mention passing right through a house. The solution is so simple and achievable: a setback of at least 1.5 miles would eliminate more than 99% of the problems associated with wind farm installations. Report Prepared for: Mr. Daniel D’Entremont Lower West Pubnico, Nova Scotia Prepared by: Gordon Whitehead, B.S., M.A., Aud(C), Audiologist 210 Windsor Drive, Stillwater Lake, Nova Scotia B3Z 1G5. 23 May 2006

- The **Dr. OGUZ A. SOYSAL** Ph.D., Professor and Chairman of the Dept. of Physics and Engineering at Frostburg State University in Maryland, measured sound levels over half a mile away from the Meyersdale, PA, 20-turbine wind farm. Typical audible (A-weighted) dB (decibel) levels were in the 50-60 range, and audible plus low-frequency (C-weighted) dB were in the 65-70 range. 65-70 dB is the loudness of a washing machine, vacuum cleaner, or hair dryer. A difference of 10 dB between A and C weighting represents a significant amount of low-frequency sound by World Health Organization standards. Acoustic Noise Generated by Wind Turbines Presented at the Lycoming County, PA Board Hearing on 12/14/2005 Available at http://www.windaction.org/idoGuments/1503

- **DR. NINA PIERPONT, MD, PhD:** Wind turbines should not be built within 1.5 miles of people’s homes. Let it be understood, however, that there will still be health and life quality problems caused by wind turbines beyond this radius. People living 1.5 to 3 miles from a proposed turbine site should be notified of potential health and life quality effects, and for this they should be appropriately compensated. Health Effects of Wind Turbine Noise, Nina Pierpont, March 2, 2006 Available at http://www.ninapierpont.com

- **DR. AMANDA HARRY, MD, a British physician:** DR. AMANDA HARRY, found (near a 16-turbine installation in 2003) that 13 out of 14 people surveyed reported an increase in headaches, and 10 reported sleep problems and anxiety. Other symptoms included migraine, nausea, dizziness, palpitations, stress, and depression. Dr. Harry recommends no turbines be built within 1.5 miles of any Home. Wind Turbines noise and health, February 2007. Dr. Harry summarizes her report: There are many people living near wind turbines who are suffering from problems with their health. The
Noise produced from wind turbines is an extremely complex one, and I feel that it is the complexity of the noise and vibration which causes the disturbance. From my discussions with people suffering from ill health who live near wind farms, it seems that the symptoms suffered can occur up to a mile from the wind farm. Until further independent medical and epidemiological research has been carried out, I would suggest that no wind turbines should be sited closer than 1.5 miles away from the nearest home.  


- Professor ALVES-PEREIRA and her colleague, NUNO CASTELO BRANCO, M.D.; have written a paper titled “In-Home Wind Turbine Noise is Conducive to Vibroacoustic Disease,” which they presented 1 September 2007, in Lyons, France, at the Wind Turbine Noise Conference WTN-2007.


- BARBARA J. FREY and PETER J. HADDEN (researchers), recently published a 137-page report on “Noise Radiation from Wind Turbines Installed near Homes: Effects on Health, with an Annotated Review of the Research and Related Issues” (February 2007). See http://www.windturbinenoisehealthhumanrights.com/ this may be the best single source on health issues and industrial turbines. After presenting voluminous evidence, the authors recommend at least 2 km (1.25 miles) of setback from people’s homes for turbines up to 2MW installed capacity, and even larger setbacks for any turbines over 2MW.


- DR. VAN DEN BERG, a physicist at the University of Groningen in The Netherlands: Residents living up to 1,840 feet and more have reacted strongly to the noise; residents up to 6,200 feet (1.2 miles) distance expressed annoyance. Frits van den Berg, studied noise levels around a German facility of 17 turbines. In a paper published in the November 2004 Journal of Sound and Vibration, he found that at night, because the surface air is often more still than the air at the height of the blades, the noise from the turbines is 15 to 18 dB higher than during the day and carries farther. He noted that residents 1.9 kilometers (6,200 feet or 1.2 miles) away expressed strong annoyance with noise from the facility.

- International research showed it was “general protocol” to allow for a 2km buffer, even with smaller turbines. In New Zealand there were no consented wind energy developments with more than a handful of houses closer than 2km. NICK CHURCHouse 15 November 2005.“Turbines too close to homes” - http://www.windcows.com/files/NZ-Turbines too_close_to_homes.mht

- DAVID MICHAEL MANLEY PhD BSc (Hons) AIEEE MIQA FInst P C Dipl AF FICDSD CEng Chartered Acoustician, Physicist and Engineer member: UKNA COMMITTEE “SOME ACOUSTIC EFFECTS OF WIND TURBINES” Dr. David Manley, Chartered Physicist, Acoustician and Engineer states: Much work has been done by me near wind farms to evaluate the acoustic effects. It is found that people living within five miles of a wind farm cluster can be affected and if they are sensitive to low frequencies, they may be disturbed. I am currently working in conjunction with Dr. Amanda Harry a.
practicing physician in this subject and she has over fifty examples of people affected by LF wind farm noise.

What is happening is the high velocities of the large turbines wind foils cause aerodynamic noise modulated by the regular dynamic pulse when the wind foil passes the base of the turbine.

It has been found that an extensive seismic signal passes through the earth and may well at night affect people's sleep. It is admitted by fellow acousticians that much more research in this subject is needed and that none has been done since 1996 by the DTI. At many inquiries, wind farm promoters will not accept there is an acoustic problem.

We are getting much data from Europe as well to paint a more accurate picture and feel that no more wind farms giving an alternative to power stations should be built. I gave two talks as an invited 'Speaker' at the recent successful Saddleworth Conference. These talks were about the evidence of "hot lines" from clusters of turbines which will at times cause much higher LF signals than first thought.

Available at: http://makaraguardians.orcon.net.nz/whatsnew.htm August 2005

Meridian Energy Limited: Meridian does not have a specific setback distance in relation to turbines and private dwellings. There are several aspects of the development process that need to be taken into consideration before the final distances can be determined between the turbine/turbines and a dwelling or dwellings. In general terms, the project team needs to consider the following aspects of the project and its related location:

- The regional/local body plans and provisions;
- The turbine types and sizes being considered;
- The number of potential turbine locations;
- The sound power levels of the proposed turbines;
- The background noise levels at the dwellings;
- The orientation of the turbines in relation to the dwellings;
- The landscape that the turbines and dwellings are located in.

Once the project team has taken all of the above into consideration it is able to understand what the final turbine/s to dwelling/s distance will be. In summary, there is no set formula that can be applied across all projects to determine a separation distance. With the intention at all times to separation distance can be known. Carolyn Wylie Senior Project Relationship Manager Meridian Energy Limited
Level 5, Creo House, 57-59 Courtenay Place, P O Box 10840, Wellington.
P. 04 381-1295 F. 04 381-1201 M. 021 2455500
W. www.meridianenergy.co.nz September 18, 2007 (Electronic mail response.)

Australia - To avoid adverse noise impacts on the amenity of the surrounding community, wind farm developments should include sufficient buffers or setbacks to noise sensitive premises. As a guide, the distance between the nearest turbine and a noise sensitive building not associated with the wind farm is to be 1km. (Source-Guidelines for Wind Farm Development, Planning Bulletin, Western Australia)

Low-frequency infrasound can reach a dwelling predominantly through the ground as vibration. In Noise and Vibration From Wind Farms (Hawke's Bay, Australia-Today, February 18, 2006), engineer Dr. Ken Mosley states: "The foundations of modern turbines create vibrations in the ground when they are
moving, and also sometimes when they are not moving; Dr. Mosley says. This vibration is transmitted seismically through the ground in a similar manner to earthquake shocks and roughly at similar frequencies. Generally, the vibrations cannot be heard until they cause the structure of a house to vibrate in sympathy, and then only inside the house. The effects inside appear as noise and vibrations in certain parts of a room. Outside these areas, little is heard or felt.

- **Bovina Township, Delaware County, New York. BOVINA TOWN BOARD VOTES TO BAN WIND TURBINES**  
  *March 13th, 2007* - In an historic vote on March 13, 2007, after months of controversy and research, the Bovina Town Board banned wind turbines from this scenic Catskill town. Bovina is the first town in the Catskills to take a clear position against industrial wind development. The Bovina vote follows a twelve-month moratorium during which residents made their views known to town officials through open meetings sponsored by the board, hundreds of letters, a town survey, a petition, and a poll sponsored by industrial wind opponents. The vote was three in favor of a ban, one opposed. About sixty people attended the public hearing before the vote.  

- **Andes Township Delaware County, New York: March 13th, 2007 - Planning Board's Wind Turbine Decision OK'd By Andes Town Board Industrial Towers Banned; April 10 Public Hearing Will Complete Process** A decision made recently [on Feb. 28] by the planning board in the town of Andes concerning wind turbines has been approved by the Andes town board. At the town board's March 13 meeting, Supervisor Martin A. Donnelly commented that a resolution concerning the matter will be drafted by Town Attorney David Merzig. He also announced that a public hearing will be held on Tuesday, April 10, at noon; and that copies of the resolution will be available before that date. The planning board, after many months of study, decided that industrial wind turbines, which drew considerable opposition from town residents, would be banned. Smaller turbines would be allowed for private use, Donnelly indicated. The planning board's decision has been commended by those who have voiced opposition to the larger turbines. At the conclusion of the meeting, town resident Fred Cubero, who has often criticized board actions, told the board, "This is the best decision you have ever made, because it shows that you are looking out for the best interest of the people of this town." From an article in the March 14, 2007 edition of The Walton Reporter: [http://www.allianceforbovina.org/html/delaware-county-wind-news.html](http://www.allianceforbovina.org/html/delaware-county-wind-news.html)

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**Noise Effects Testimonials From Those Living Near Wind Turbines:**

- **CHILTON** Presentation: Wed. August 1st. A variety of presentations given by people affected by wind turbines. **WENDY TODD, DANIEL d’ENTREMONT, MIKE WASHECHECK.**

- **DANIEL d’ENTREMONT** formerly lived within 1,000 feet of a turbine in Canada. (Testimony offered in person in Chilton, Wed. August 1st.) Daniel has since moved from his house and has been unable to sell the house. "Wind farm noise drives family from home." Man claims inaudible sound made family sick. **HALIFAX - Giant wind turbines spin next to Daniel d’Entremont’s home in a tiny rural community in southwestern Nova Scotia. The large house in Lower West Pubnico is now empty and abandoned, Mr. d’Entremont says, because inaudible sound from the 17-turbine wind farm made his family sick. "The noise is unbearable," he says from Abrams River, the nearby community he recently relocated to with his wife and four of his six children. "It’s like a surround sound - you can’t avoid it, you can’t ignore it. It just comes right into your head." Mr. d’Entremont blames the turbines for sending low-frequency sound into his old house, located about 400 metres from the nearest turbine. He says his family couldn’t sleep, his children were constantly tired and suffering headaches, and nobody in the house could concentrate. He finally moved in February after receiving the same advice from a U.S. pediatrician who has studied the effects of wind turbines on children. The complaints from the d’Entremont family have prompted the federal Natural Resources Department to order new noise testing, which will measure the low-frequency.
sound in Lower West Pubnico. (SEE NATURAL RESOURCES CANADA; letter) above: May 12, 2006
Telegraph-Journal By James Keller Canadian Press

- JOHN YUNK, LINCOLN TOWNSHIP Board Supervisor: His personal testimony on July 10, 2007 via telephone. Reports turbines are LOUD and cause him and his family extreme difficulty in trying to sleep at night. John recommends turbines be cited a minimum of 1 mile from a residence. As a supervisor on Lincoln Town Board, John continues to entertain noise complaints from town residents. I spoke to John personally.

- ROB IDE, VERMONT, director of Energy Efficiency for the Department of Public Service, has said that the noise from the 11 550-W Searsburg turbines is significant a mile away. Residents 1.5 and even 3 miles downwind in otherwise quiet rural areas suffer significant noise pollution.
  http://www.aweo.org/ProblemWithWind.html

- JANE DAVIS: Resides 930 meters from Deeping St Nicholas Wind farm just south of Spalding in Lincolnshire. The wind farm was built last summer (2005) and became operational in early June (2006) -- within 3 days we started having problems with the noise and hum emanating from the windfarm. Since last June we have had constant issues with loud noises and low frequency sounds that create a hum in the house all the time. We have kept a log throughout. Many times last summer as we are downwind of the prevailing wind we were woken by loud "WHOOSHING" noises, that stopped us sleeping for more than 4 hours a night. We informed our local environmental health department in June and they came out and were astonished at the loud noise recordings that they made. We now know that we suffer from a phenomenon known as aerodynamic or amplitude modulation. We also know that "in general, turbines are noisier now than in 1993". (Hayes McKenzie Partnership -- Acoustic Experts in a report for Angus Council, Forfar, Scotland. June 2004). This seems to support the fact that the government found it necessary to set a specific measurement for wind turbine noise, and that there is a Noise Working Group that operates between DTI & DEFRA. Aerodynamic modulation is not fully understood; Dr McKenzie from the Hayes McKenzie partnership in the closing statements in April 2007 for South Cambridgeshire District Council explained that: Aerodynamic modulation exists, but there is no clear understanding as to what causes it. It causes sleep disruption. It is not covered by ETSU. This site (Deeping St Nicholas) is a likely candidate. There is a need to assess and potentially apply a correction to ETSU. We do know and accept that not every wind farm creates noise issues but those that do make life impossible for those who live near them -- and by near I mean less that 2km or 1.5 miles. As a result of our difficulties we have been forced to find an alternative place to sleep -- our sleeping house -- which is 5 miles away in Spalding itself. After spending many nights "sofa surfing" we reached the conclusion in December that we had to do this in order to be able to work and live safely -- with a normal amount of sleep.

- DR. STEPHEN BRIGGS: an archaeologist who lives in the village of Llangwryfon in West Wales, initially welcomed the news that 20 turbines were to be built in the hills behind his home. He said: "I'm as green as the next man and the developers assured us that the windmills would cause hardly any disturbance, but once they began operating I couldn't work in my garden any more - the noise was unbearable. It was as if someone was mixing cement in the sky". Two neighbors became ill from a lack of sleep and after four years of frustrated appeal. The Briggs family left their home of 17 years. House prices near to wind farms have also plummeted. January 25 2004 54.ichyllytwt "Wind farms make people sick who live up to a mile away" By Catherine Milner. CATHARINE M. LAWTON: March 11 2004 letter to Mike Grainey, Oregon Department of Energy. And found at:
  www.publications.parliament.uk/pa/cm200506/cmselect/cmwelaf/876/876we33.htm

- MR. GORDON YANCY: owner of Flatrock Inn, Loweville, NY. The Inn is surrounded by wind turbines. Gordon has a lot to say and will talk to anyone who is in jeopardy of having wind turbines in their future. Gordon stated "that sleeping with them is nearly impossible." To quote him, "Take your vacuum cleaner, put it next to your bed, plug it in, turn it on, LEAVE IT ON, and try to go to sleep." Gordon Yancey February 2006 letter to Catherine Bush.

- MARK TAPLIN, who has lived close to a wind farm near Truro in Cornwall for almost a decade, said: It has been a miserable, horrible experience. They are 440 meters away but if I step outside and they are not generating I know immediately because I can hear the silence. They grind you down - you can't.
F. SETH ROBSON: "Noisy turbine annoys neighbours": Windflow Technology shut down its Gebbies Pass wind turbine each night because of noise concerns. People 3km from the wind turbine could hear it whenever it was running they said, "It would be quieter than 30 decibels and we would only be able to hear it 3 per cent of the time...We are hearing it almost 100 per cent of the time when it is running," Mr Riley said. Two noises were emanating from the site; just more than 1km from her house, "Two hydraulic pumps run all the time...I can hear those at night," she said. "When they have the blades going it is terrible. It sounds like grind, grind, grind...It obliterates the bird sounds and all the nature sounds that we have all come here for," Windflow director Geoff Henderson said the turbine was being shut down at night while the noise problem was sorted out. "We are not running at night because the neighbours have a concern about the noise levels, and we have acknowledged we need to do something about it." 11 August 2003 http://stuff.co.nz/stuff/0,2106,2623358a11,00.html

DARRELL FOX: 6421 1550 E Street Tiskilwa, IL 61368: "Since the turbines have been up and running, it's horrifying." Darrell said the sound they hear ("It's always there," he said) is a jet-plane noise...It's worse at night. A low rumble. He said he imagine a day when there is low cloud cover and a jet is going through the clouds and you can't see it; you hear it. Again, always: When the wind is blowing from behind the blades; the jet noise is at its worst. They have several turbines to the west of their home, and with the wind out of the west it is terrible. Again, night the worst. When the wind is out of the east, so the wind hits their house before it strikes the turbines, it is the quietest., Darrell said, too, that the wind company, here, did the same thing that Noble & Zilkha have done: they took bulldozer loads of people to some wind farm, parked them right underneath, and the people said, "Well, these are totally silent." The wind salesmen told folks the turbines "are about as loud as the gentle hum of a... refrigerator." Darrell remarked on this: "This is an outrageous lie! You have to be about a quarter of a mile, or further, and then you actually hear them," said Darrell, their highway supervisor, an honest man (said Darrell), went on his own to this same windfarm, tape-recorded and videotaped the turbines, and said "these things are a disaster." "They're noisy," etc. He was ignored. Like me, Darrell suspects that when the bus trips visit the showpiece windfarms, the company feathers the blades. He also described a pulsed sound, a "thumping" sound, but, again, mostly the loud roar. He also talked about the strobe effect. He described an incident recently where he went...
down the road to feed some cattle by the creek, it was late in the day, the sun was setting behind the turbines, and he had his back to the turbines. The shadow flicker covers the entire farm. On this occasion he became seriously nauseous from the shadow flicker. He also described what he called a "siren" sound, from time to time. It's like an ambulance going by on the highway. This siren noise is also affected by the wind. Darrell added that the turbines interfere with TV reception. That they chop the reception and they can tell when the blades are actually cutting through the reception. The wind company has promised to install satellite dishes for all of these folks. Lastly, he talked about the strobe lights: red lights at night, white during the day. Very obnoxious. His parents can't sleep at night. They are forced to sleep with "white noise" in their room. They run a noisy fan in their room, trying to mask the turbine noise. He and his parents are all rather irritable these days. Darrell added, the wind companies were horrible. "They lie!" he repeated over and over in our conversation. Letter to Dr. Martin Luther September 25, 2005.


- ROSE MARIE DERK, who lives a mile away from the turbines from the Waymart Wind Farm, Moosic Mountain in western Wayne County, Pennsylvania said the noise and aesthetic impact have been significant. She said the turbines sound like a large industrial fan and the disturbance is more noticeable at night when there is no traffic. "When you go to bed and your windows are open, you're hit with this buzz and roar," Derk said. "They're in the wrong place." Derk said numerous residents tried to stop the project at the township level to no avail. Now that the turbines are up, she said they look "outrageous and scary" and the benefits to the community have been minimal. "People thought they'd get their electric bill reduced, but ours went up and we're getting nothing," Derk said. "I can't understand what anybody thought they'd get out of this. This company came in, destroyed the top of the mountain and left us with it.


- MR. ARLON MONFILS, chairman of the Town of Lincoln in Kewaunee County, Wisconsin, publicly stated during the February 20, 2006, meeting of the Monroe County Sanitation/Planning & Zoning/Forestry Committee, that Lincoln residents have experienced "excessive noise from turbine blades" and "shadow [flicker] from blades." Mr. Monfils recommended that Monroe County residents "protect yourself the best you can." 6

- PAULA STAHL, April 4, 2004 "THE NOISE WAS INCREDIBLE" It surprised me. It sounded like airplanes or helicopters. And it traveled. Sometimes you could not hear the sound standing right under one, but you heard it 3,000 yards down the hill, where the wind carried the sound. [This is cited from a letter written by Paula Stahl of St. George, West Virginia, about her experiences living in the neighborhood of the 66 MW Mountaineer Wind Energy Center. Formerly known as the Backbone Mountain Wind Farm, the 4,400-acre site has 44 turbines, 1.5 MW each, stretched along miles of ridgeline in Tucker and Preston counties. Ms. Stahl submitted the letter to the Berkshire Eagle and North Adams Transcript, neither of which has printed it.]

- LINDA COOPER: "I live in Tucker County [West Virginia], approximately 1.5 miles from the Backbone Mountain wind turbines, and have tried everything to get used to them. A brief visit to one of the viewing areas certainly gives no true impression of what it is like to be forced to live with them. We have now suffered for three long years under their hideous shadows. They have taken over the entire landscape and are in our sight no matter where we go, day or night, 24 hours a day, 365 days a year. The movement is impossible to ignore, no matter how hard we try, and the noise they make travels miles and miles, down the mountains and hollows, disturbing people who cannot even see them from their homes. I compare the noise to Chinese water torture, or fingernails on a chalkboard, or water dripping in a pan. Even on the calmest nights, the endless drumming goes on; windows closed, pillows over the head, it is still inescapable. While we were led to believe this would be a clean, quiet, pristine, and environmentally-friendly way to address energy problems and give a huge boost to our ailing economy, I feel we have been tricked. There appears to be no recourse or plan to compensate us for property value losses, erosion of our quality of life, or mental anguish. Besides these 44 wind turbines, thousands more are in the pipeline! God help!" -- from, "Activist Shares Wind Power Concerns -

- Pastor KATHLEEN DAN LEY, Naples Record, November 3, 2004: "AGAINST THE WIND" (Excepts) My husband and I own a home in the township of Fenner, New York, and it is located in the middle of the Madison wind farm. I am not, and never have been, against wind power; but I want people to be well aware of the negative side of these giant windmills before allowing them to be built in your neighborhoods. Unfortunately, we were not given all of the facts, or we were given somewhat twisted information. We were told that the windmills had been redesigned so as not to be noisy, but the grinding noise goes on 24 hours a day (when they are operating) and at times is far worse than other times.

We also have lost our television reception and were forced to purchase a satellite dish. Prior to the towers we always had very good reception of the local stations and generally had two to three more. Now it is impossible to get any of those stations. Incidentally, there is no cable in our area. The wind tower builders/management have more than once promised to look into this situation but have done nothing. They do not answer phone calls or follow up on appointments that they make with us.

Out of necessity, to aviation there are lights on top of the towers, which now flash directly into our bedroom and living room windows all through the night necessitating the closing of the blinds and robbing us of the view of our own backyard and God's gift of nature -- one of the main reasons we moved to the country in the first place. Promises have been made and broken over and over again, and I find that also to be an extremely sad situation.

I pray that you can find a way to work through many of the issues without having such a huge impact on those living nearby. (Letter Reprinted with permission)

http://www.greenberkshires.org/wind_power_postings/against_the_wind.html

- TOM SHEA, June 15 2006 Searsburg windmills aren't silent; intelligent. I have the unfortunate opportunity to see and hear these monstrous industrial generators defacing the previously pristine wilderness-on-a-daily basis. These generators are not providing "clean" energy. They have destroyed a sizable part of the open terrain in Searsburg. They are a constant noisy reminder of the intrusion of big business on a small, picturesque Vermont town. They are not "silent." They make constant noise with loud sporadic banging of the huge gears needed to turn the immense generators. In addition to being a sensitive black bear habitat, this area is also a migration route to ducks, geese and hundreds of other smaller migratory birds. All of this wildlife has been harmed by placing this electrical generating facility in the middle of the Green Mountain National Forest.

TOM SHEA, Berkshire Eagle, June 15, 2006 (reprinted with permission from the author)

http://www.greenberkshires.org/wind_power_postings/searsburg_windmills.html

- DWAYNE & KEVIN BAILEY, PRINCE EDWARD ISLAND CANADA (July 20, 2007) Dwayne developed headaches, popping and ringing-ears; and could not sleep. He tried new glasses, prescription sleep aids and earplugs; to no avail. Dwayne's two year old was sleeping well prior to the wind farm, but began waking up, 5-6 times a night. Kevin Bailey stated, "When you are outside working and absorbed in what you are doing, you are OK. If inside, resting or reading, it's a problem. Forget about sleeping at night. The repetitions would go away, you think that it is gone, and it comes back again." Kevin tried sound dampening by draping the front walls inside his house, and sleeping in the back, but this did not work. Kevin had problems with his electrical appliances. The fridge, water heater and power meter all vibrated. He purchased a new fridge, and it was just as bad. When the fridge was moved to the new house, the vibrations were gone. They complained to the province and the municipality, but no one would take them seriously. One official suggested it was too quiet there which is a funny kind of problem to have. There was not enough ambient background noise to block out the sound. Both families moved from the property.

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• JULIE and BART THIRY of Kewaunee County, who live in a ranch house 800 feet from the nearest of five turbines, believe that the windmills are somehow responsible for the persistent headaches of their 8- and 9-year old daughters.7

• MARK HARRIS, a pastor from Bridgewater, Maine, spoke Friday August 3rd, 2007 at the Ground Search and Rescue in Pugwash about how a wind farm in Mars Hill, Maine has terrorized locals. He bought property in Mars Hill roughly 1200 feet away from the turbines, but hasn’t done anything with it because of how unbearable the sound and strobing from them is. “Many of the mills we have, on certain days when the wind comes from a certain direction and the humidity is such and such, it will be all but silent at 1200 feet away where my home site would be. But come back the next day and it’ll pound until you can’t tolerate being there and there’s no predicting when that will happen,” he said. He said the wind farm has wreaked havoc on the town, with many people now dealing with health complications allegedly caused by the turbines’ sounds and shadows. “Everyday (residents) deal with the sound. The intolerable levels aren’t every day, sometimes one or two days a week, sometimes it’ll skip a week but the next week it’ll be there for four or five days in a row, and there’s no knowing until it happens,” he said. “It’s pretty frustrating.” Harris thinks wind turbines being 500 metres away from property, which is currently the law in Cumberland County, isn’t enough. He said turbines would be safe if placed at least two kilometres away from residences. “I’m in favor of wind turbines, but they should be appropriately sited,” he said. “This needs to be done in the most responsible way so we keep it in good standing with the public. I think we need it. “The placing of them seems to be irresponsible far too often.” By Justin Dickie The Amherst Daily News 6 August 2007

• PAMELA FORINGER: “Our Fenner Wind Farm Story” Fenner, NY. Autumn 2004 As I sit in my kitchen and type this on my computer, I hear the constant hum of the blades. It’s early November, a brisk day and of course the windows are closed, so that muffles the sound a little. In the summer, with the windows open, there is nothing to block out the humming or the grinding sound that the turbine makes when it is being turned. Because the wind constantly changes direction the blades have to be turned to catch the wind. Imagine turning a 24-ton object perched on top of a 200 ft tower. That takes a bit of force and at times the sounds emitted are rather eerie. Depending on the weather, it can sound like a grinding noise or at times the shrieking sound of a wild animal. In the winter the noise always seems much louder, perhaps because of the starkness of the season and lack of foliage to muffle the noise. Anyway, when people tell you that the wind towers are virtually noiseless, they haven’t lived a couple of football fields away from one 24/7. Regardless of whether you see them or not, you still hear them—even when they are not operating. When the brakes stop the rotors (because it’s too windy), you hear a clunking and grinding that sounds like freight train cars colliding. And when it’s time to start them again, you can at times liken it to the roar of a jet engine. We have some absolutely gorgeous sunrises and sunsets in Fenner. As the sun slowly rises to the east of our house it usually bathes our bedroom wall with its rays. Unfortunately, we now get a strobe effect that can drive you absolutely crazy. It’s commonly called the “flicker factor.” As the sun shines through the rotors it creates a shadow pattern that you would liken to a strobe light. Because of the close proximity of 4 of the towers to our house, we get this light show at various times of the day, as the sun travels from east to west. Most of the time I have to close our shades to prevent this from giving me a migraine. And speaking of light shows, we get the nighttime show as well. Each tower has red blinking lights on top of the turbine, so unless the shades are closed in the bedroom at night there is a constant red light blinking in perfect view as we lie in bed. In the past we would see thousands of Canada geese as they made their way to the local swampland for a well-needed rest during their long journey each fall. The snow geese, whose migration pattern brought them directly over us, have since found a more convenient route—at least I haven’t seen them recently. Proponents of the wind farm would say it’s not so, but after 20+ years I think we can vouch for the fact. Our surrounding cornfields used to be full of geese this time of year. Not anymore. It didn’t happen overnight but, slowly, the numbers have dwindled. (reprinted with permission) http://www.allianceformedith.org/pdf/PamelaForingerOurFennerWindFarmStory.pdf

• RUSSELL BOUNDS: Railey Realty, 2 Vacation Way, McHenry, Maryland 21541 TESTIMONY Before the Maryland Public service commission on windplants affecting property values 2005. Have you heard from people in the vicinity of the wind turbines as to what problems they have as a result of the wind turbines? Yes. What is their primary complaint? The primary complaint is noise. Second is the visual
Dear Scott,

Thanks for your email. The changes are made and yes, you may use our photos in any way which will help. If you need anything else please ask.

Daniel

November 28, 2007

To The People of Union Township, the Union Township Board Members,

Life for the d'Entremont family since the Pubnico Point windfarm began operating has been filled with sorrow, illness, heartache and disbelief. How could a company be permitted to enter our community and turn our pristine area into a noise ravaged battleground? Why did it happen to us? Not that we would wish it on anyone else. First off, the community knew there was a windfarm being planned because two of the windfarm owners live in the community. They put up an anemometer tower and formed a company named Landco and proceeded to acquire the land necessary to construct their windfarm. Now they are leasing the land to another company which owns the windfarm. Through word of mouth and some public meetings which nearly nobody attended people understood that the windfarm would be inaudible to the neighbors and would have no negative impact on the community. The residents of Pubnico could not visualize a 400ft wind turbine on Pubnico point or had any idea of the impact they would have nor did anyone research anything about it, including me. Since two of the owners were local residents and were related to most of the community everyone wished them well. The company kept everyone in the dark about the negative effects and the few who asked any questions were lied to. The first 2 turbines were operating in May 2004. One was 4000ft from our home, the second 4700ft. A 120 day trial period was required to monitor their productivity. We could hear them well and Carolyn, my wife was experiencing ringing in her ears. Visitors would comment that the one 4000ft away seemed really close. Some neighbors were complaining they were bothered by them at night.

Three months later construction began again. People were complaining about the speeding gravel trucks and feared accidents. An older woman was rear ended by a truck. She wasn't hurt, but the company quickly gave her a car to drive until they returned her car repaired. Nothing more said.

The heavy trucks damaged the roads. It was easy to tolerate the noise and construction dust because we knew it was only temporary. February 2005 the windfarm was fully operational. 17 wind turbines. The windmill 4000ft away seemed far off compared to the one 1000ft from our home. They are loud. They've been compared to jet engines a plane that will not take off. There is no gentle swoosh, it is a whirring noise. They grind, they bang, they creak. The noise is like a surround sound, it's omnidirectional. It feels like there's this evil thing hovering above you and it follows you everywhere, it will not leave you alone. This noise will not allow you to have your own thoughts, the body cannot adapt, it's a violation of your body. It is a noise that the human body cannot adapt to even after more than a year of exposure. As time progresses the noise becomes even more unbearable. Our 5-year-old son Elias was afraid and unable to sleep in his own bed for more than one year. He would get in our bed or in his brother's bed. We would put him to bed at 8:30 and many nights at 11:00 he would still be awake. Finally he would fall asleep wrapped up in the blankets in the fetal position with his head covered and with a fan at his head. We had to create more noise to mitigate the windfarm noise. The body can adapt to the fan noise. In September 2005 he started school and he was not
getting enough rest. He began getting more and more aggressive with his friends. He was very
defiant We knew he was suffering terribly. He’s had throat infections and often had a fever and not feeling well.

In January 2006 we had our house tested by a naturopathic doctor and she and her colleagues found the house so toxic that they advised us to move. These people were on our property for only 1.5 hours and they became so weak that they had to leave. The doctor said she couldn’t think, she couldn’t concentrate anymore. In February 2006 we brought Elias and Samuel(9) to another naturopathic doctor and she also recommended that we leave our home. Our family doctor says he cannot prove that a wind farm causes medical problems but he would not want to live or raise children where we are. We have contacted a scientist from Portugal who has studied the effects of infrasound on the human body and she also told us to leave for our sake. We abandoned our home February 21st, 2006. Since the move Elias has been doing much better. He sleeps in his own bed every night. He sleeps partially covered with his arms and legs spread everywhere. It was only ten days after the move while he was having his back rubbed in bed he said, “it’s nice to be able to go to bed and sleep”. He is much less defiant. He has become the kind gentle little boy he was before the windfarm nearly destroyed his life. Knowing what we know now we should have moved a year before. Our 9 year old son Samuel was sharing a room with Elias. He was also very sleep deprived. He would get up in the morning very tired. We would send him to school tired. He was tired and unable to concentrate and his school work suffered. He was also unable to concentrate on his homework. He began to withdraw within himself. He also began getting aggressive. Samuel seemed to be always angry. His teacher asked us what was the problem with Samuel because his change in behavior was something she would never have expected from him. Samuel’s ear drum burst while we were there in 2005. He’s had many throat infections and many headaches. He has developed allergies. He’s the only one of 6 children that has allergies. Since the move Samuel has improved so much in his school work and his behavior and participation in class that the teacher says she cannot believe that he’s the same child. He has not been aggressive with his friends. He’s so kind and caring for everyone. His headaches are less frequent and less severe. Our 13 year old daughter Emanuelle had dramatic behavioral changes. She became withdrawn and was spending too much time alone in her room. She dropped her friends and lost interest in school work. She was also angry. She dropped all sports(basketball,volleyball, soccer,badminton). Emanuelle always had headaches. She became very defiant. Since the move Emanuelle is doing better in school. Her behavior is steadily improving. Her health is improving and she is socializing. She is feeling better about herself. Our 15 year old daughter Deminica was having a lot of difficulty sleeping. She was being awakened at all hours of the night. She was asking for sleeping aids. She had numerous headaches and some throat infections. She was very moody. She slept sound at friends homes. She had frequent severe abdominal pain. Since the move Deminica is sleeping well. She has not had any abdominal pain. Her headaches are rare. Her mood has improved. Our 19 year old son Nathaniel was sleeping in the basement. He was anxious and angry and was not sleeping well. His hands were peeling often. Nathaniel also developed vision problems. He loses sight completely in one eye or the other for a few minutes at a time. Many mornings Nathaniel had to grab his legs and put them off the bed and lift himself up with his arms. After some time he gets mobile. He has seen a number of eye specialists and undergone many tests and the doctors could find nothing wrong with him. There was a stair master machine at his high school which would measure how many stories a person could climb. Whatever the record was the teacher felt it would be difficult to break. Nathaniel more than doubled the record and he could carry his 540lbs friend on his back. One year near that windfarm he was nearly blind and crippled. Since the move Nathaniel is not as anxious or angry. He is relaxed and easy going. His hands are not peeling anymore. It took one year away from the windfarm to regain his vigor his eyes are almost entirely healed. Our 21 year old son Nehemiah was extremely angry and anxious. Nothing was ever satisfactory. He was yelling and screaming. He had headaches Since the move Nehemiah is much calmer, not anxious and his anger almost gone. He is smiling and laughing a lot and is content. My wife Carolyn was anxious and she had numerous headaches. She was getting up frequently throughout the night to urinate and she was having pain with that. She could not get the sleep required to be rested. She was feeling her heart racing. She had shoulder joint pain which required cortisone injections. Her hearing was affected on the right side. Her glands on her neck were always swollen and painful. She was feeling a vibration in her lower legs on occasion when she was outside. Carolyn’s vision is blurred and the doctors cannot find any problem with them(seems like there is a film on the eye balls). She also has high blood pressure. Carolyn spent more time in our house than any other member of the family. Since the move Carolyn is not anxious and her headaches are fewer. She hasn’t felt the
vibration in her legs. Her eyes and shoulders have not fully recovered yet. She is sleeping much better. Carolyn is trying to find help to restore her vision. As for myself I always felt a sensation in my chest which was very discomforting. On extremely rare occasions when the windfarm was off I could sense they were off without seeing them. The noise was just a relentless attack on our bodies. Every time the blades passed the towers I could feel it within my body. I was unable to concentrate well enough to read in my bed. Since the move I don't have that sensation in my chest but it returns when I spend a few hours at our house. These physical and psychological effects develop gradually and sometimes it seems silly to associate them with a windfarm until you learn that others experience the same thing under similar conditions. If we would have had absolutely nowhere to go, if we would have been forced to stay in our home, I hate to think what kind of physical and mental state we would be in now. During the months that the sun was low in the sky we got a flickering in the morning and late afternoon as the sun passes behind the turbines. This induces headaches quickly to those who are more susceptible to them. When the full moon rises and passes behind the turbines the flickering is intense. We are devastated, we are broken because we have lost the home we built with our own hands and we have lost the land which has been in the family for generations. Our house is now unsellable. There is nobody in the community that wants to live there because of the windfarm. Nearly everybody supports us privately but they are afraid to speak out publicly. We are a community of 2000 people and I did a survey of 216 people and 96% said the windfarm was too close to our house. Also 89% said the windfarm was too loud at our house and 78% said that they felt they were not properly notified of the impact this windfarm would have on the community. Many people will randomly tell me that they sense that the community would not have allowed the construction of this windfarm if they had known or realized the impact it has had. Our local politicians were all in on the great deception. Our provincial legislator said they had made a mistake but we would have to pay for it and put up with it. He also told me to shut up about it. Other neighbors are experiencing more and more difficulty in coping with the windfarm. Instead of adapting to the windfarm it is getting more intrusive. The neighbors are having more difficulty sleeping and the problems associated with that. One neighbor had to sleep with ear plugs in the summer. Our neighbors are like us they love the area and the land they are on and they don't want to move. Our children were suffering so much the decision to abandon our home was made for us by the wind company. There has been some noise studies done at our home. They clearly prove excessive noise even with the outdated guidelines they are using but the windfarm is still permitted to operate full time. The turbines this company used are Vestas, V-80, 1.8 Megawatt. The Vestas workers who had experience in a number of areas erecting wind turbines told some community members if anyone complains give them one year and they'll shut up. In this case they were wrong. It's still difficult to believe or accept what has happened to us. It didn't have to be that way. With proper planning and setbacks these problems don't need to arise again for anyone.

Daniel d'Entremont

Precedence For Larger Setbacks From Property Lines:

- ECOENERGY LLC, a division of The Morse Group, and its partner company Acciona will agree to follow the county's new setback guidelines for wind farms in Stephenson County, IL. Zoning changes altering the classification of wind-farm projects were approved by the County Board on July 11. One of the provisions of the new zoning ordinance is that wind turbines have to be at least 1,000 feet from the property of non-participating landowners, an increase from 500 feet. Shawn Gaffney, president of EcoEnergy, said his company's voluntary compliance is part of an effort to improve communication and relations with landowners and the public. In meeting the new setback requirements, EcoEnergy will likely have to relocate and in some cases eliminate wind turbine sites in the proposed farm. The company is continuing to work with adjacent landowners during this process, and hopes to start construction in 2008. "I think we feel it would be in keeping with the spirit of being a good neighbor," Gaffney said of the voluntary compliance. "We'd like to show the community this is a real project with
TREMPEALEAU COUNTY WISCONSIN: Each Wind Turbine shall be set back from the nearest property line a distance no less than one-half (½) mile, unless mitigation has taken place and agreed by owner/operator and affected property owners involved, and recorded in the Trempealeau County Register of Deeds office which describes the benefited and burdened properties and which advises all subsequent owners of the burdened property. Passed 12-17-07.

TOWN OF STOCKBRIDGE, CALUMET COUNTY WISCONSIN: WIND ENERGY SYSTEMS LICENSING ORDINANCE: The Town Board of the Town of Stockbridge, Calumet County, Wisconsin, does ordain as follows: at least 1,000 feet from the property line of a non-participating property, unless the owner of the non-participating property grants an easement for a lesser setback. The easement must be recorded with the County Register of Deeds and may not provide for a setback that is less than 1.1 times the total height of the Wind Turbine; September 12th, 2007.

TOWNSHIP OF CASCO: Ordinance 03-06 states: Each wind Turbine shall be setback a minimum of two times the total height from a non-participating property line or 800 feet. (Note: a minimum of 1.1 times the total height or 500 feet is proposed in the ECOENERGY UNION PROJECT. The Town of Casco ordinance was provided to the committee by planning commission member Kim Gruebling. The committees submitted a records request to the Town of Casco for supporting documents for the setback and did not receive a response).


MANITOWOC COUNTY WISCONSIN: Wind Turbines are required to be at least 1,000 feet from a non-participating property owner. Chapter 24 of the County ordinance:

TOWN OF WILTON, MONROE COUNTY WISCONSIN, passed resolution # which requires all Large Wind Energy Systems to be a minimum of 1/3 of a mile (1760 feet) from any property line. See attached resolution.

MANITOWOC COUNTY WISCONSIN ― County supervisors approved at their Tuesday meeting (September 18), two amendments to the county’s large wind energy system ordinance. Supervisors also voted unanimously to adopt an ordinance requiring all large wind energy systems to be setback one mile from any emergency communications tower. The county Planning and Park Commission recommended the amendments after it held a public hearing on both amendments on Aug. 27. Herald Times Reporter 9 September 2007 http://www.wind-watch.org/news/2007/09/19/county-alters-wind-ordinance/

WHITE RIVER TOWNSHIP, MUSKEGON COUNTY, MICHIGAN: No part of a WECS or WECS Testing Facility (including guy wire anchors) shall be located within or above any required front, side or rear yard setback. The setback for placement of a WECS or a WECS Testing Facility shall be at least 1600 feet from each property line of the property where the structure is located and at least 1600 from any public road right-of-way. Furthermore, no WECS or WECS Testing Facility shall be located within 1600 feet of the high water mark of Lake Michigan or White Lake. Posted 11-12-07 http://www.wind-watch.org/documents/wp-content/uploads/whiteriver-ordinance.doc

TOWN OF BARTON, WASHINGTON COUNTY WISCONSIN: Residential Lot Setback - 20 rotor diameters or 1,320 feet from all property lines of lots in a residential zone, whichever is greater. State of Oregon - Model Wind Energy Conversion System Ordinance, Draft of 12/31/96, pp. 16 - 17. (Catherine M. Lawton, Town of Barton, Washington County, Wisconsin: Commercial Wind Energy Facility, & Wind Access Model Ordinance)

Manitoba Canada: The people in Manitoba fought back and instead of a 500 meter setback they now have a more realistic 2000 meter (2167 feet) from their property lines. Wind Turbine Setbacks-UPDATE Sept.11 2007 - Posted on January 25th, 2007 http://windfarms.wordpress.com/2007/01/25/wind-turbine-setbacks/