Deerfield Wind, LLC
PSB Docket No. 7250
April 28, 2008

STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Deerfield Wind, LLC, for a certificate of public good authorizing it to construct and operate a 17-turbine, 34-35.7 MW wind generation facility, and associated transmission and interconnection facilities, on approximately 80 acres in the Green Mountain National Forest, located in Searsburg and Readsboro, Vermont, with 7 turbines to be placed on the east side of Route 8 on the same ridgeline as the existing GMP Searsburg wind facility (Eastern Project Area), and 10 turbines along the ridgeline to the west of Route 8 in a northwesterly orientation (Western Project Area.	)

PREFILED DIRECT TESTIMONY OF

LISA LINOWES

ON BEHALF OF INDUSTRIAL WIND ACTION GROUP, INC.

APRIL 28, 2008

Summary:

Ms. Linowes addresses concerns with the project proposal specific to avian and bat impacts, forest habitat fragmentation, road design, the benefit of the wind project in relation to the New England grid system, predictive noise survey etc.

Direct Pre-filed Testimony of Industrial Wind Action Group
April 28, 2008

1) Please state your name and address for the record.

My name is Lisa Linowes, and my address is 286 Parker Hill Road, Lyman, NH 03585.

2) Please summarize your education and background as it relates to this matter.

I am executive director of Industrial Wind Action Group, Inc. (www.windaction.org), a national organization based in Lyman, New Hampshire. The organization is focused on raising awareness of the potential impacts of large-scale wind energy development. I have ten years experience in land use and zoning issues and have served on local land use boards and conservation commissions. I am also a director of the NH Association of Conservation Commissions. My formal education includes a Bachelor in Science in Software Science from the Rochester Institute of Technology and an MBA from Southern New Hampshire University.

3) Why did you petition to become an intervenor in this matter before the VT PSB?

Windaction.org subscribers number close to 1500 with the majority residing in eastern U.S. states including Vermont and its three bordering states. Our subscribers have a strong interest in ensuring wind energy proposals are considered in a deliberate and comprehensive manner with a keen focus on the costs of such development. Up to a third of Windaction.org subscribers reside within the ISO-NE control area and will be directly and substantially affected by the outcome of this proceeding. Further, this project is proposed on federal lands and outcome of this proceeding will have far-reaching impact. While Windaction understands the US Forest Service ultimately will decide what can and will be built in the Green Mountain National Forest, we strongly aver that the record built through this proceeding will serve to substantially balance and influence any federal proceedings or decision. Thus Windaction subscribers across the U.S. will be directly and substantially affected by this proceeding at the local, regional, and federal level.

4) Do you oppose wind energy?

No. There is a place for generation powered by wind. However, such development must be properly sited to ensure sufficient benefit that can justify any qualitative and quantitative environmental, health and societal impacts. We are hopeful that these proceedings before the VT PSC will reach some conclusive understanding of the project's benefits and costs.

5) Are you satisfied that pre-construction avian surveys conducted by the applicant correctly identified risk to migrating diurnal (daytime) birds?

No.

6) Please explain your concerns regarding diurnal migratory birds i.e. raptors.

According to the Hawk Migration Association of North America (HMANA), peak migration in New Hampshire, particularly for broad-wings, occurs during the first three weeks of September. Migration is dependent upon many variables, with continental weather conditions being one of the most impacting factors. Since there is no "best" time of day to observe migration, experienced observers spend full days watching for activity.

Document DFLD-RRWE-3 prepared by Woodlot Alternatives, Inc. details the raptor survey study for the project. Appendix A of the document Raptor Survey data tables from the Fall 2004 survey. Table 1 shows 20 days were surveyed as follows: Sep 2-3, 14-15, 21-24, Oct 1, 3, 6, 7-8, 20-21, 23-24, 29-31. The 20 days alternated between two areas within the project site. The first was the near turbine #8 of the existing facility; the second was in the "Western expansion area". The observers limited their survey to the hours between 9am and 3pm.

It is clear from Table 1 that the number of raptors observed at the Western expansion area was considerably higher than the existing site and the passage rates per hour was also much higher. In Section 5.6 of DFLD-RRWE-3, it states "The results of the field surveys indicate that fall raptor migration in the Deerfield Wind Project area is low relative to other sites in the region."

Since so few days were included in the survey period, compounded by using alternating days to observe two separate locations in the project area, the conclusion drawn by Woodlot appears unsubstantiated. Given the gaps in days where no observations were made at all, Woodlot cannot be certain the periods of observation corresponded with peak migration. It appears the fall raptor migration study is grossly inadequate and should be expanded for more days and multiple years before any firm conclusions can be draw.

Although the protocol for the fall survey purportedly adheres to that established by Hawk Migration Association of North America, the limited numbers of surveys, missing significant portions of the migration season, were inadequate to document migrant raptors' use of the project area.

In Table 4 of the document, Woodlot attempts to characterize the Deerfield site's importance (or not) as a raptor migration site by comparing it to other sites within the region. Given the vagueness of fight patterns year after year, a comparison to these other sites is not a meaningful metric. There can be significant

differences in hawk counts from one season (e. g. fall) to another at the same migration watchsite and between watchsites. It is for this reason that USFWS interim guidelines[1] and other organizations recommend multiple seasons of observation (minimum 3 years by USFWS) on which to draw conclusions as to the relative importance of a raptor migration watchsite. (**The Migrations of Hawks** (1986. Indiana University Press, Bloomington, IN) by Donald S. Heintzelman; and **Guide to Hawk Watching in North America** (2004. Falcon Guide/Globe Pequot Press, Guilford, CT) by Donald S. Heintzelman).

Woodlot attempts to compare raptor observation rates from 1993 and 1994 at the existing site to rates observed in 2004. This comparison is not meaningful since no information is provided regarding the days and times of the 1993-94 survey and those surveys appear to have been limited to the existing site where far fewer raptors now appear to be observed. According to Woodlot, the 1993-94 surveys showed 5.6 birds/hr and the same location in 2004 shows half that rate at 2.45 birds/hr. We also note that Woodlot makes no comment as to whether the existing turbines have displaced raptors or changed flight patterns.

In short, the VT PSB, VT State Agencies, and the public have no meaningful data on which to evaluate the risk to diurnal migratory birds.

7) What about the potential impact to nocturnal migrants if the project were built?

I have very serious concerns regarding the potential risk to nocturnal migrants, including bats and birds.

Documented in the July 28, 2006 letter from US Fish and Wildlife Service (Appendix F), Vernon Lang describes in detail the most appropriate method of surveying a site using radar for assessing nighttime migrant activity and the risk to migrants should a project be built. In the letter, he states:

> With respect to specific details of the radar study protocols, we recommend 45 days of data collection during the period April 15-June 5, and 60 days of data collection during the August 15-October 31 period. Our preference is for radar equipment that is designed for 24/7, constant operation in horizontal and vertical modes with automated electronic storage of raw radar data.

While we are pleased the applicant conducted a radar survey in fall 2004 and 2005, the survey periods fell far short of Fish and Wildlife recommendations. For 2004, only 28 nights were surveyed between Sep 16 to Oct 29. The 2005 survey was for 32 nights between Sep 2 and Nov 1. The 32 nights surveyed in 2005 represent half the number of days requested by USF&W for a fall survey and a full 61 days less than the realistic migration period, which extends from at least August 1 (mainly for bats) through at least the end of October (for birds), totaling 93 nights. (See Appendix I)

[1] Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines. http://www.fws.gov/habitatconservation/wind.pdf

Still, despite the limited survey period, the results provide some points of concern.

The 2004 radar survey reported the overall mean passage rate for the period at 178+/- 24 targets per kilometer per hour (t/km/hr). Woodlot attempts to compare the fall 2004 passage rate to other rates found at other sites in the same year with this statement: "it appears that the general magnitude of migration observed in Searsburg during 2004 was similar to, though slightly lower than, similar radar surveys conducted recently in the Northeast and Mid-Atlantic States." Woodlot then adds that "The fact that the Searsburg results are lower could be expected, as it's more northerly location limits the size of the continental bird population that would be flying south, over the area, compared to sites further south."

Yet, the following year's survey in 2005 found the overall mean passage rate for the period to be considerably higher at 559+/- 87 t/km/hr, three times the number of targets from the year prior.

In the conclusion of the 2005 radar survey report, Woodlot makes this statement: "The results of the surveys indicate that bird migration patterns are generally similar to patterns observed at other sites in the Northeast."

Given the variation year over year, and the high passage rate for Deerfield in 2005 compared to other surveyed sites, Woodlot's statements from 2004 and 2005 appear arbitrary and unsubstantiated.

In fact, the overall mean passage rate for the 2005 survey was one of the *highest* mean passage rates recorded for radar studies conducted for this purpose (see Appendix H). While the survey period for the Deerfield site was limited, it provides an index to the abundance of migrants in the area, and as such is useful for comparisons with previous studies and other radar studies that use similar equipment and methodology. The table included in Appendix H lists the average passage rates for 31 separate projects. These include Mars Hill, ME, Sheffield, VT, and Churubusco, NY with 2005 'fall' mean passage rates of 512, 114, and 152 t/km/hr respectively. All three studies were conducted by Woodlot suggesting the same methodology was employed.

Thus, given the limitation in days and the timing of the survey, passage rates over the Deerfield project site were still very high. On September 10 alone, nearly 20,000 migrants were recorded flying over the site and Sep 27 and Oct 20 saw 16000 migrants and 14000 migrants recorded respectively. This suggests the targets were following the topography. While most of these targets were flying above the turbines, if a fog or low-ceiling cloud event set in causing the targets to drop their elevation, the potential for collision would be great.

The mean flight direction through the project area is also important. This was recorded at of 221 degrees +/- 71 degrees, suggesting the direction of the south-bound fall migrants was mainly oriented in the same

direction as the ridgeline of the project site Mountain. Any collision risk would be greatly elevated because birds and bats would likely encounter multiple wind turbines when passing through the project area.

8) Is mean passage rate the indicator of collision risk? What about flight height?

First, I'd like to clarify the purpose of the radar study and how it helps us in determining risk to migratory birds and bats. Turbines are not selective of the species they kill (as far as we know); hence all targets that pass a turbine are vulnerable. The numbers at risk (exposure) are the numbers that pass within the rotor-sweep space of the turbine. The Gamesa G87 2.0 MW turbine, one of types of turbines under consideration for the site, has a sweep area of 5945 m^2 or 1.47 acres and reaches up to 125 meters tall. Without radar data no one knows how many nocturnal migrants are exposed to the proposed turbines and that data cannot be collected by any other means with the same accuracy. Thus, radar is the best tool to determine this census of exposure.

Two key factors to be determined from the radar study are: a) number of migrants passing in the area *and* b) percentage that flies within the rotor space of the turbines represent.

Woodlot documented the mean flight height hourly as well as the percent of targets that flew below 100 meters. The mean flight height of all targets was 395 meters +/- 21m (1296 feet) with a 'seasonal' average of targets flying below 100 meters at 13%. On Sep 10 where nearly 20,000 migrants flew over the project site, Woodlot reports that 13% were flying below 100 meters or within the rotor swept area. The number of migrants at risk would be over 2000 targets. ***Note: we take objection with Woodlot's use of 100 meters. These numbers should be recalculated based on 125 meter heights, the height defined in Zimmerman's direct testimony.***

9) What conclusion would you draw from this information?

It appears that the Deerfield project may pose a very high risk to nocturnal migratory birds and bats. Again, at 559 t/km/hr and a mean 13% flying at or below 100 meters (again, 100m is too low), Deerfield represents one of the highest number of nocturnal migrants flying within the rotor space of the other studies cited in the table in Appendix H.

However, Woodlot's seasonal information is not complete for three reasons:

1. the radar survey did not sample any days in August;
2. the horizontal risk area for the project was limited to a sample space of 1km;
3. the survey was conducted for only two seasons, fall migration years 2004 and 2005.

To highlight the possible risk to migratory targets in the Deerfield project area, it's worth noting the letter included in Appendix B dated September 20, 2006 from Virginia's Department of Game and Inland Fisheries (VA DGIF) to Joel Peck of the State Corporation Commission regarding risks to wildlife should the Highland New Wind Development LLC facility be approved. The nighttime radar study for that project reported an average passage rate of 385 targets/hour/km, 40% lower than the Deerfield figure (559 t/hr/km), and a mean of 11.5% flying below 125 meters.

While some may argue possible differences in methodology from one study to the next, there is no question VA DGIF was concerned about fatality rates. On page 2 of the letter, it states, "The applicant's data and data from existing wind farms in the Alleghenies provide evidence that there likely will be large fatality rates at this site." It further states on the same page: "*In the absence of studies that compare pre- and post-construction data, we presume a significant positive correlation between passage rates and fatality rates.*"

This statement is consistent with this assertion by Wildlife Biologist Daniel Boone who, in his August 4, 2006 letter to the Maryland Public Service Commission wrote:

> "…using the long-standing practice of evaluating collision risk based on the numbers of birds and bats that pre-construction studies determined would be within the rotor-swept area of a proposed windplant (as is recommended in the USFWS Guidelines and likewise implied in the NWCC "Guidance Document" – see p. 67: "…it may be assumed that the more time a species spends flying at heights encompassed by the rotor swept area of turbines, the more risk the species faces in a wind plant."). The MD Siting Guidelines need to be revised to specify that "the potential for high risk" of collision with wind turbines is directly related to whether large numbers of low-flying birds and bats occur within the project area of a proposed windplant."

In light of potential high risks to migrant targets, we reserve the right to provide in supplemental testimony a list of recommendations for mitigation practices that could minimize risk to birds and bats should this project be approved.

10) Regardless your concerns with the pre-construction study, isn't it true that bird mortality per year at wind facilities is very low?

The National Wind Coordinating Committee's Nov 2004 (Appendix C) document entitled: "Wind Turbine Interactions with birds and bats: A Summary of Research Results and Remaining Questions" (also known as the "Avian fact sheet" states that the average number of birds dying due to collision with turbines is 2.3 birds per turbine per year. However, this average is based on 12 post-construction studies where only 2 of the 12 studies were conducted in the East vs. the Northwest (4), Rocky Mountains (2), and Upper Midwest (4). The average number of birds killed per year per turbine for the East was more than double the averages from the three other geographic locations.

Gil Randall, Chairman of the Environmental Committee, Hawk Migration Association of North America (HMANA) had this to say:

> We still do not know with any certainty what kind of risk turbines pose to migrating and resident birds in the northeast. But the risks to birds could be significant in the northeast, where migration tends to be much more concentrated and less spread out than in the west. We don't know what effect turbine developments might have on the northeast's rebounding American Bald Eagle population, either, but recent reports from Europe on White-tailed Sea Eagle fatalities caused by turbines are alarming.

11) And what of average bat mortality rates at wind facilities in the U.S?

Referencing the tables in Appendix C, bat mortality at wind facilities in the East, on average, is very high at 46 bats per turbine per year as compared to other locations in the Northwest (1.2), Rocky Mountains (1.2), and Upper Midwest (1.7). Two wind projects located in the ridge-and-valley region of Pennsylvania and West Virginia have documented annual mortality of between 2,000 and 4,000 bats per wind facility for the last two years. Merlin Tuttle, director of Bat Conservation International in Austin, Texas said of the WV bat mortality in 2003: "[This is] *by far the largest bat mortality event I know of worldwide and, as far as I know, the biggest mortality event of any animal.*"

Referencing the VA DGIF letter in Appendix B: "*High fatality rates … would be particularly devastating to bats because of their reproductive strategy, which is atypical of a small mammal … [Unlike most small mammals], They have small litters (typically one or two young), only one litter per year, and life expectancy of 12-15 years. With this strategy, the impact of the loss of individuals is much greater, especially within small populations.*"

12) What are some of the consequences of forest habitat fragmentation at the site?

In Paul Kerlinger's March 2002 report entitled *An Assessment of the Impacts of Green Mountain Power Corporation's Wind Power Facility on Breeding and Migrating Birds in Searsburg, Vermont* July 1996–July 1998, Kerlinger wrote:

> The potential for negative impacts resulting from habitat modification and presence of turbines should not be taken lightly as forest fragmentation is an important and timely conservation issue among wildlife managers and conservation organizations. The fact that many forest interior species are declining is significant, especially with wind power development being proposed for forested areas of the northeast. The question of interest to conservationists and agency regulators is whether these species can coexist with turbines."

Forest interior habitat, the habitat deep in woodlands and secluded from the influences of forest edges and open space, is becoming increasingly rare. This habitat is now home to certain forest-dependent wildlife that require it to survive. The short, informative document included in Appendix D entitled "*Conserving the Forest*

Interior: a Threatened Wildlife Habitat" explains that for every opening in a forested area, a full 100 meters from the forest's edge inward converts to edge habitat. For the Deerfield project area, there will be approximately 20 acres of forest interior habitat lost per turbine.

13) According to the Mr. Krzanowski's prefiled testimony, the ridge roads will be a gravel surface width of thirty-eight feet during construction and sixteen feet afterwards. In time, would the vegetation lessen the impact to forest interior habitat?

This project is designed to add approximately 4 to 5 miles of expansive 38-foot wide roads between the turbines, and to create permanent clearings for wind turbines. A 38-foot width, which represents the gravel surface of the road, is at least as wide as a 3-lane interstate in Vermont, however, in this case the road is being built through a densely, largely contiguous forested area, on a ridgeline, in a rural community of under 500 residents.

The applicant's response to discover question #6 (Appendix J) states "ridge roads vary between forty and 160-feet, toe-to-toe." He also states, in response to question #12 (Appendix J) that the "submitted plans represent a 20% design" and that "culverts have not as yet been designed."

Pages CS102 and CS109 of the project plan show four pipes with lengths varying between 50 and 60 feet. It is apparent culvert pipes will exceed the 38-foot width of the road.

While the applicant has asserted the roads will be permitted to re-vegetate back to a 16-foot width, it is not apparent what this means. Stormwater controls which will be constructed to the sides of the road will remain intact. In response to discovery question #26 (Appendix J), the applicant states "While trees may grow on the embankment slopes, only herbs (and some shrubs, possibly) will grow on the re-vegetated road portions."

Further, since the project roads will need to be constructed to withstand the size and weight of the turbine components as well as the necessary transport and lifting vehicles, the road's subsurface and related compaction of road surface will likely prohibit growth beyond shallow grasses. It's also uncertain whether there will be sufficient soil in the area that would enable growth to occur quickly or easily after construction.

It is unlikely impacted areas where the road will be constructed will ever return to a forested state throughout the duration of the project. Thus the forest interior habitat will be lost.

With only 20% of the road design completed and submitted to the VT PSB, it is not reasonable for anyone to fully evaluate the impact of the project on the natural environment, including wetlands and existing habitat.

14) Moving on to the project's purpose, do you have any comment on generation from wind?

The New England region is evaluating its energy needs and taking steps to encourage a diversity of resources to meet demand, including renewable energy. It's fundamental that any generation that gets built be able to contribute to our growing capacity needs in the region. ISO NE's CEO Gordon van Welie stated in 2006 that "Electricity demand throughout New England is growing by the equivalent of one large power plant every year," and that "as New England's electricity supplies decrease, the price of wholesale electricity will increase and reliability will be threatened."

Wind energy is an intermittent resource that will generate capacity only when the wind is blowing and within a specific speed. If the winds are light, we get little or no generation from the facility. If the winds are gusty with considerable fluctuation within limited intervals (10-15 minutes) the intermittency becomes more pronounced. While traditional sources of electricity generation produce within 5-10% of nameplate capacities, the electricity output for a wind-powered facility and the timing of that output is a function of the local wind profile. The nameplate capacity represents only the maximum production of the generator. The applicant has asserted before the Committee that anticipated average capacity factors for the project would range from 35% across one year. According to production reports to the Federal Government, no reporting wind project in the Appalachian Mountain/Eastern States achieved a 35% average capacity value in 2005.

The State of New York conducted a study on wind energy to determine the availability of the resource and whether there were any transmission limitations to building wind in the state[2]. In that report, New York stated that onshore wind could be expected to produce at an effective capacity of 10% (Appendix A) "due to both the seasonal and daily patterns of wind generation being largely "out of phase" with the NYISO load patterns". In other words, the ability of the onshore wind resource to reliably contribute capacity during peak periods (summer, mid-afternoon) was only 10%.

The Electric Reliability Council of TX (ERCOT), presented similar conclusions before the Texas legislature in 2005[3] where they said:

> "In addition to meeting the state's energy needs (MWh), the electric system must also meet expected peak demand (MW). Generation resources other than wind will be needed to meet most of the projected growth in peak demand, as maximum output from wind resources does not correspond to system peak demand. ERCOT currently assigns 10% of the installed capacity of wind turbines to its calculation of the ERCOT peak capacity reserve margin. Based on a review of historical data of actual wind turbine generation during ERCOT system peaks (from 4 p.m. to 6 p.m. in July and August), the average output for wind turbines was 16.8% of capacity. However, the data also showed that for any hour during these months, the output of the wind turbines could range from 0% of installed capacity to 49% of installed capacity. Stakeholders comprising the ERCOT Generation

[2] http://www.nyserda.org/publications/wind_integration_report.pdf

[3] http://www.ercot.com/news/presentations/2006/RenewablesTransmissi.pdf

> Adequacy Task Group have expressed concern that use of an average number (i.e., 16.8%) was too optimistic because it fails to adequately recognize the intermittency of wind generation. Accordingly, the group is working to assign a peak capacity value for wind using an appropriate "confidence factor." While the group has not yet formally made a recommendation to the ERCOT Technical Advisory Committee, it is currently considering recommending a wind capacity value of 2%. In summary, in order to reliably meet system peak demand, dispatchable resources (such as gas, coal, biomass) would be required to replace the wind resources when wind is not blowing."

The ISO NE, in its Stakeholder Scenario Planning initiated last fall, has expressed uncertainty as to the effective capacity to assign wind on the grid. For the scenario process, the ISO set the figure at 20% and will be evaluating wind data in the region to validate this assumption. While the applicant has asserted the project will generate at 35% capacity on average, this does not tell the ISO, or VT PSB, how much generation the public can reliably expect from the facility during periods of peak demand.

While the applicant has stated average capacity anticipated from the project, the submitted information does not attempt to prove this point. Nowhere in the application are the wind characteristics at the project site qualified. How often does the wind blow? when does it blow (time of day, time of year)? at what speeds? and at what variability? These are all basic questions to be answered before the true benefit of the project can be determined and whether that benefit outweighs attendant impacts.

15) Regardless the capacity figure, isn't it enough that this renewable project will generate emission-free energy thus displacing generation from traditional fuel sources? In other words, isn't 1 MWh of wind generation 1 less MWh of fossil fuel generation?

Looking at wind generation in isolation and not considering the time of day and time of year of the generation, or the other power facilities on the grid at the time the wind was blowing, presents an overly simplistic and inaccurate description of how the grid operates. While wind generation can offset fossil fuel use, which here in New England is likely natural gas, and perhaps hydro, any emission reduction would need to be evaluated in the context of the New England grid system. The sum reduction (or offset) in greenhouse gases should this wind project proceed is not a certainty.

16) Will building this project enable New England to avoid having to build other power facilities to meet energy demand?

Since wind is an intermittent and unpredictable generator, the firm capacity it can supply to the grid is inherently limited, and will not eliminate the need to build more reliable forms of generation in the region. In other words, if we build wind turbines and accept their attendant impacts, it will still be necessary to build more substantial generation, whether it be renewables (biomass, land fill gas, small hydro, and even solar which can produce during peak demand), or more traditional generation (nuclear, natural gas, clean coal technology).

The ISO NE 2006 Regional System Plan (RSP06) was very clear (pg 5) in stating: "Without adding new resources to the system, the frequency and severity of responding to a capacity deficiency would increase over time and vary with changes in demand and other factors." Using the ISO's 20% figure (still an assumption to be validated) the Deerfield Wind project can be expected to produce only 6.8MW, representing 0.025% of the New England grid's peak demand reached on August 2, 2006 (28,127 MW).

It's worth noting that the RSP06 also makes this point: "Locating generators near areas of relatively high demand provides the capacity needed to meet demand while minimizing the need for transmission expansion." Wind energy projects must be built where the wind resource is, and for onshore wind in New England, this typically means siting the facilities far from the demand centers.

17) Regarding noise, the applicant has committed to meeting a standard of 45 dB LAeq(8) during the night and 50 dB LAeq during the remainder of the day as measured outside the bedroom window with windows opened. He also states the sound modeling for the project as reflected in Ex. DFLD-KK-4 demonstrated sound levels will be below 45 dBA as measured at the exterior of the closest residences, thus will be less than 30 dBA as measured in the interior of the homes. Do you have any comment regarding these assertions?

Yes. According to document DFLD-KK-4 Revised Noise Impact Study, the applicant states "Modeling was completed for the project using Cadna A acoustical modeling software. Made by Datakustik GmbH, Cadna A is an internationally accepted acoustical model, used by many other noise control professionals in the United States and abroad." While we do not dispute this fact, the applicant fails to note that the Cadna A software is suitable for evaluating ground-based noise sources and that increased operations sound pressure levels above the predictive model may occur due to the hub level to surface wind potential disparities, as well as increased atmospheric refraction above the predictive model. The Cadna A modeling software does not appropriately account for the refraction and reflection effects of the sound. It is difficult to determine what level of confidence the VT PSB, State agencies, or the public can place in the preconstruction predictive sound levels.

Currently the State of Maine is evaluating noise levels at the Mars Hill wind energy facility following complaints from residents living within 3000 feet of the turbines. The Cadna A software was also used to predict sound levels for this site. Preliminary reports indicate the project is out of compliance with the 50 dBA sound limits permitted by the Maine State Department of Environmental Protection. Appendix E includes several letters prepared by Mars Hill residents where they document their experience with noise from the turbines.

18) According to John Zimmerman's Direct Testimony, a safety buffer of 836 feet would be sufficient to ensure a very low probability of being injured by falling ice. Do you have any comments about this?

Yes. In a Jan 20, 2000 e-mail to an American Wind Energy Association mail list (Appendix G), Mr. Zimmerman presents a very different understanding of the risks due to ice at and around the Searsburg wind energy facility. The e-mail is descriptive of the icing situation at the project site. One quote from the e-mail follows:

> I have stood near the turbines GMP had on Mt. Equinox in the early 1990s and more recently the Zond 500 KW turbines in Searsburg Vt during and after icing events. When there is heavy rime ice build up on the blades and the machines are running you instinctually want to stay away.
>
> They roar loudly and sound scary. Probably you would feel safe within the .5 mile danger zone however.
>
> One time we found a piece near the base of the turbines that was pretty impressive. Three adults jumping on it couldn't break.

19) Are there any further comments you would like to make at this time?

No.

20) Does this complete your pre-filed testimony?

Yes.