

BROWN & BURKE
ATTORNEYS AT LAW
85 EXCHANGE STREET - P. O. BOX 7530
PORTLAND, MAINE 04112
www.brownburkelaw.com

TELEPHONE (207) 775-0265
FACSIMILE (207) 775-0266

RUFUS E. BROWN
M. THOMASINE BURKE

September 28, 2009

VIA E-mail (Mark.T.Margerum@Maine.gov)

Mark Margerum
Project Manager, Oakfield Wind Project
Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

*Re: Objections of the Trustees of Martha A. Powers Trust to
Oakfield Wind Project*

Dear Mark:

As discussed on the telephone last week, I am sending this letter as the attorney for the Martha A. Powers Trust (the "Trust"), land owners adjacent to the Oakfield Wind Project (the "Project"), in opposition to the Application of Evergreen Wind Power. The Trust objects to the Application on 4 grounds: (1) visual impact, (2) noise (3) funding of the decommissioning costs and (4) reduction in land values. Each objection will be addressed below.

A. Objections as to Visual Impact

The Trust's property adjoins the Project boundaries and will be negatively impacted by it visually. Initially, no visual impact analysis was done in relation to Pleasant Lake (much of the lakeshore of which is owned by the Trust) based on the mistaken belief that Pleasant Lake was not a "scenic resource of state or national significance" as defined by 35-A M.R.S.A. §3451.9,

enacted by Chapter 661, 123rd Legis. Second Reg. Sess. (the “Wind Power Act”). When the mistake was discovered, the Applicant submitted a Visual Impact Assessment Addendum dated June 30, 2009, addressing how the Project will impact visually Pleasant Lake. This assessment is incomplete, inaccurate, and inconsistent and does not fairly depict the extent of the visual impact of the Project on Pleasant Lake and does not give DEP adequate information to properly evaluate the visual impact.

The deficiencies of the Assessment Addendum has been addressed in a letter to you by Philip Powers, one of the Trustee’s trustees and beneficiaries dated September 10, 2009, based on Mr. Power’s lifetime familiarity with Pleasant Lake. In addition, the Trust requested the Assessment Addendum to be reviewed by Jean Vissering, a landscape architect with a special expertise in wind power visual impact assessments. Ms. Vissering’s Report, dated September 21, 2009, is attached hereto as *Exhibit 1* and her resume is attached to this letter as *Exhibit 2*. Ms. Vissering concludes that the material submitted by the Applicant is insufficient to properly evaluate the visual impact of the Project on Pleasant Lake and raises several questions about the validity of what was submitted.

B. Objections as to Noise:

The *Sound Level Assessment* submitted by the Applicant in Section 5 of the Application was performed by Resource Systems Engineering (“RSE”), the same firm that provided a noise assessment in the Record Hill Wind Project. In fact the *Sound Level Assessment* is virtually identical to the one submitted in Record Hill. The Trust objects to the noise analysis of the Application on the same grounds that aggrieved parties in the Record Hill Wind Project objected to the Record Hill noise analysis, which is currently on appeal to the Board of Environmental Protection. Later this week, Richard James, a principal of E-Coustics, with extensive experience

in wind power noise issues, will supplement the Trust's objections to noise, summarized below.

The Applicant represents that the Project will comply with quiet limits of 55 dba for daytime and 45 dba for nighttime noise at the project boundaries and protected locations as required by DEP's Chapter 375 §10.C.1.v. with hardly any cushion, see Table 3 at pg. 10 of the *Sound Level Assessment*, except for a 3 dba deviation allowance for accuracy uncertainties of the sound calculations and a 2 dba deviation for uncertainties concerning sound level estimates. Moreover, there are 10 locations where there were predictions that the sound limits will be exceeded, for which easements or a lease arrangement was obtained to exempt such locations from the sound limits. *Sound Level Assessment* at 10, Table 4. The Trust objects to the validity of these predictions as well as to the adverse health effects that will follow from the Project as proposed for the following reasons:

1. *The Limitations of the Models Used to Measure Noise.*

The *Sound Level Assessment* states that RSE's prediction model for sound propagation used Cadna/A (operating in ISO 9613-2, *Attenuation of Sound During Propagation Outdoors*, mode). *Sound Level Assessment* at 7-8. The problem with this prediction model is that ISO 9613-2 (*Exhibit 3*) was not designed for wind turbines, and it was not designed for sound sources at a height of a ridgeline, such as that proposed for the Project. These problems with using Cadna/A (operating in ISO 9613-2) were acknowledged by the DEP's own consultant, Warren Brown of EnRad Consulting, in an internal conference call last March on the subject of noise in wind power applications pending before the DEP. In the *Notes of March 5, 2009 DEP Conference Call* between Warren Brown, Dora Mills, Maine Center for Disease Control ("MCDC"), and others (*Exhibit 4*), Warren Brown stated that he "has issues with [the] model being used. Currently it's based on industrial noise, not wind power noise. *We haven't been able*

to determine whether this model is accurate for wind turbines.” [Emphasis added.] Later in the Notes he states that RSE predicts compliance with 45 dba nighttime noise, “but [he] still [has] questions regarding the model – [it is] based on industrial noise.” He states “wind turbine noise needs more investigation. 1. Need to be able to predict stable atmospheric conditions 2. Set up protocol for acoustic measurements with DEP staff member on site. ... Questions RSE’s assumption – due to model. ... There is a period when turbines are loud. *Not sure how to predict this yet. Need to figure out stable atmospheric conditions.*” [Emphasis added.]

The concerns expressed by Warren Brown in the conference call are reflected in credible scientific literature on the subject. For example, Frank H. Brittain & Marlund E. Hale, in their article, “Some Limitations of Ray-Tracing Software for Predicting Community Noise from Industrial Facilities,” NOISE-CON, Dearborn, Michigan (July 28-30, 2008) (*Exhibit 5*), state that ISO 9613 estimates the accuracy of A-weighted sound propagation noise for distances only up to 1 km, but it is routinely used for distances greater than that. A study by Kenneth Kaliski & Edward Duncan, “Propagation Modeling Parameters for Wind Turbines,” NOISE-CON, Reno, Nevada (October 22-24, 2007) (*Exhibit 6*), states that modeling of wind turbines in flat and relatively porous terrain may yield results that underestimate actual sound levels when using standard ISO 9613-2 algorithms, and that “wind turbines often operate with wind speeds that are higher than the ISO 9613-2 methodology recommends. The combination of higher wind speeds and high noise source may result in greater downward refraction.”

The effect of “atmospheric stability” on the accuracy of sound assessments using the ISO 9613 algorithms that Warren Brown referred to is also the focus of a study by Clifford Schneider, “Accuracy of Model Predictions and the Effects of Atmospheric Stability on Wind Turbine Noise at Maple Ridge Wind Power Facility, Lowville, NY- 2007”. *Exhibit 7*. Atmospheric stability

occurs at night when the land cools and vertical air movement disappears, and where wind can be calm on the ground but continue to blow at hub-height. When this occurs, Schneider explains, “[w]ind turbine sounds are more noticeable, since there is little masking of background noise, and more importantly, because atmospheric stability can amplify noise levels significantly.” Pg.

6. Schneider states that most wind assessments never mention atmospheric stability. Pg. 7.

Schneider concludes that the developer’s predicted noise levels using ISO 9613 were too low when compared against noise levels measured during the actual operation of the wind project.

“Further the accuracy of the ISO 9613 protocol is a +/- 3 dBA, without considering reflected sounds, and it is not recommended for source levels higher than 30m” per ISO 9613 itself. Pg.

22. The same concern about atmospheric stability is expressed by Charles Ebbing in his article dated July 16, 2009, “Some Limitations and Errors in Current Turbine Noise Models” (July 2009).” *Exhibit 8*. See also, Kaliski & Duncan, *supra*, “Propagation Modeling Parameters for Wind Turbines” (*Exhibit 6*) at 6 (when noise comes from elevated turbines, i.e., from ridge mounted turbines, “sound waves may not significantly interact with the ground over distance.”).

Given the limitations of the modeling, originally expressed repeatedly by Warren Brown of EnRad in a context where he could give candid expression of his concerns, and given the support in the literature of these limitations, RSE’s sound predictions at protective locations as just barely meeting minimum sound level limitations cannot be accepted. If allowances were made by the DEP for the limitations of the sound propagation models by assuming that the noise generated by the turbines would carry further than predicted by those models, the nighttime noise limits specified by DEP Rule 375 would be exceeded for the Oakfield Project.

2. *The Failure to Use Line Source Calculations.*

In RSE’s *Sound Level Assessment* wind turbines were treated as “point sources”, see *id.* at

8, without calculations based on “line sources.” The *Sound Level Assessment* states:

Sound propagation in air can be compared to ripples on the surface of a pond. The ripples spread out uniformly in all directions of the pond surface decreasing in amplitude as they move further from the source. For every doubling of distance from a stationary hemispherical noise source, the sound level drops by 6 dBA.

Sound Level Assessment, at 2. “Line source” calculations measure sound propagation perpendicular to a row (line) of wind turbines, giving effect to the combined noise from the line that radiates in a cylindrical (directed) manner as opposed to a spherical (like a ripple in a pond) manner. The decay rate of a line source is 3 dB for every doubling of distance, one half of the decay rate of a point source of 6 dBA per doubling.

The Trust objects to the accuracy of the predictions in the *Sound Level Assessment* because, if a line source calculation were used, the DEP nighttime noise limits of 45 dBA would be exceeded for protected locations. See, the NASA study (*Exhibit 9*) at 27 and C.E. Ebbing, “Applied Acoustics Handbook” (*Exhibit 10*) at 2-8 through 2-10, Kaliski & Duncan, *supra*, “Propagation Modeling” (*Exhibit 6*) at 6 and Mats Abon, “Sound Propagation From Wind Turbines” (*Exhibit 11*) at 10. There is clear scientific consensus on this issue. The NASA studies show that the line source and point source produce similar results only at distances that exceed the length of the line, see *Exhibit 9* at pg. 27. Many of the homes at Oakfield have a direct sight line to turbines. If the RSE *Sound Level Assessment* had used line source calculations, the DEP noise limits would be exceeded.

3. *The Failure to Apply the SDR 5% Penalty.*

The DEP regulations on sound level limits, Chapter 375, Section 10.D. 19 defines “Short Term Duration Repetitive Sounds” (“SDR”) as a “sequence of repetitive sounds which occur

more than once within an hour, each clearly discernible as an event and causing an increase in the sound level of at least 6 dBA on the fast meter response above the sound level observed immediately before and after the event, each typically less than 10 seconds in duration, and which are inherent to the process or operation of the development and are foreseeable.” Section 10.C.1.d imposes a 5 dBA penalty when SDR is present for purposes of measuring sound level limits.

The Applicant’s *Sound Level Assessment* did not take into account SDR. Id. at 11. The *Assessment* asserts at 11 that wind turbines only have increased sound levels of 2-4 dBA, rendering the 5 dBA penalty inapplicable. The Trust objects to the *Sound Level Assessment* on these grounds. The Applicant’s assertion about the low level of repetitive sounds is based on a 1997 version of a British wind siting standard ETSU-R-97 that is now over 10 years old and is under critical attack by independent acoustical consultants in the UK and that many current studies show SDR sounds from wind turbines commonly in the range of 5-6 dBA and can frequently exceed 10-15 dBA . Ebbing Acoustics, “Some Limitations and Errors,” *supra*, *Exhibit 8* at 3-4 (explaining how the interaction of coherent sound waves from multiple turbines working in synch can increase amplitude modulation by 12 dBA when only 4 turbines are involved), whereas in Oakfield there are many more turbines within line of sight to several protected locations.

4. *Failure to Consider the Health Effects of Nighttime Noise.*

The preamble to DEP’s noise regulations, Chapter 375.10 states:

The Board recognizes that the construction, operation and maintenance of developments may cause excessive noise that could degrade the health and welfare of nearby neighbors. It is the intent of the Board to require adequate provision for the control of excessive noise ...

The Maine State Planning Officer Technical Assistance Bulletin # 4 (Exhibit 12) states a similar concern, warning that “[p]rolonged noise exposure is a serious threat to human health, especially when resulting in sleep interruption and especially during the nighttime hours.” The Applicant’s *Sound Level Assessment* fails to account at all for the potential health effects of the Project Wind Project. In part this is explainable from RSE’s use of flawed noise propagation modeling, as explained above. *See*, George Kamperman & Richard James, “The ‘How To’ Guide to Siting Wind Turbines To Prevent Health Risks From Sound” (*Exhibit 13*) at 1 (“The errors in the predicted sound levels can easily result in inadequate setback distances thus exposing the property owner to noise pollution and potential health risks.”) In part it is due to the refusal of the wind power industry to take the issue of health effects from wind turbine noise seriously.

This is a serious problem according to Dr. Robert Nissenbaum. Dr. Nissenbaum has been examining the adverse health effects of the Mars Hill Project in a study that will soon be published in the *New England Journal of Medicine*. Affidavit of Michael A. Nissenbaum, M.D. (*Exhibit 14*, ¶3 and Exhibit B thereto) (“Dr. Nissenbaum Aff.”). He opines, based on his experience with Mars Hill: “It is my opinion that the BEP should hold a public hearing to examine the potential health effects of the Record Hill Wind Project given the potential seriousness of the health issues, and to ensure that an appropriately corrected modeling process (compared to the flawed model that was in fact used) is implemented to best predict the sound emissions that can be expected from the Record Hill Wind Project.” Dr. Nissenbaum Aff. at ¶4. He adds that “credible evidence of negative health effects from Industrial Wind Projects [is available] from Canada (in the form of the health/symptom survey from Ontario, Canada) by Robert McMurtry, M.D., [his] own preliminary but significant findings from Mars Hill, Maine

and a draft of a potential landmark book 'Wind Turbine Syndrome' by Nina Pierpont, M.D. [Exhibit 15] Dr. Pierpont is an accomplished and well respected physician who is making significant contributions to the body of knowledge on the health impacts of wind turbines. Her basic premise about the existence of wind power syndrome has been well received by some of the foremost experts in the field of Otorhinolaryngology and Otology. [He] furthermore agree[s] with her statements and recommendations at pages 11-12 of an excerpt of her Draft Report”, namely minimum protective distances of up to 1 to 3.5 km (for mountainous terrains). Dr. Nissenbaum Aff. at ¶9.

Recently, on September 12, 2009, the Maine Medical Association (“MMA”) adopted a resolution recognizing that “assessing the potential health impact of wind turbines has been difficult to measure but if present would be of significant concern” and urging the DEP to adopt procedures that “reflect scientific evidence regarding potential health effects, and to further explore such potential health effects” and to “avoid [] unreasonable noise ... with development setbacks...” Dr. Nissenbaum Aff. at Exhibit D. This resolution passed, notwithstanding the previous objections of Dr. Dora Mills in a subcommittee considering a similar resolution. According to Dr. Nissenbaum, the “Maine CDC Director’s refusal to recognize any potential negative health effects of wind power projects, and her public statements urging the rapid establishment of Industrial Wind Projects in Maine seem to be at odds with the caution expressed by the wider medical community, as indicated by the attached Maine Medical Association resolution. Nissenbaum Aff. at ¶11.¹

¹ The Maine CDC did not investigate the cluster of health complaints in Mars Hill for potential significance. Given that Mars Hill potentially represents a new negative health phenomenon resulting from the interaction of a ridge line source of Industrial Wind Turbines sited too close to human dwellings after faulty pre installation sound modeling, this represents a failure of the Maine CDC to comply with its mandate to investigate newly arising health issues to better understand them and propose solutions for mitigation and future prevention. As such, any statements

The need to take a more cautious approach to wind turbine siting because of the potential health effects is also supported by the *Night Noise Guidelines* in 2007 (*Exhibit 16*) issued by World Health Organization (“WHO”), recommending sound levels during the nighttime at less than 30dBA during sleeping periods for children and below 32 dBA for adults. An earlier version of these Guidelines, published in 1999 (*Exhibit 17*), concluded that even then WHO believed that “low frequency noise ... can disturb rest and sleep at low sound levels” and that the “evidence on low frequency noise is sufficiently strong to warrant immediate concern.” See pg xii, xiii and 53. [Emphasis added.] See also, the discussion of the WHO Guidelines and other literature in George Kamperman & Richard James, “The ‘How To’ Guide”, *supra*, *Exhibit 13*, , which recommends greater setbacks than DEP Chapter 375.10 based on the current state of scientific evidence on the health effects of low frequency sound. Nina Pierpont, M.D., PhD, in *Wind Turbine Syndrome*, *supra*, *Exhibit 15*, states at pg. 11 that “Kamperman and James have convinced me that single, one size fits all setback distances may not be protective and fair in all environments with all types of turbines. Even so, it is clear from this study and others that minimum protective distances need to be “greater than 1-1.5 km ... at which there were severely affected subjects in this study b) greater than 1.6 km ... at which there were affected subject in Dr. Harry’s UK study and c) and, in mountainous terrain, greater than 2-3.5 km ... at which there were symptomatic subjects in Professor Robyn Phipp’s New Zealand Study.” Dr. Pierpont’s work was among those studies referenced at the MMA meeting resulting in the resolution described above.

Further record support for the need to take seriously the potential health effects from wind

emanating from the Maine CDC on this subject must be viewed as being based on incomplete information, at this point in time. Dr. Nissenbaum Aff. ¶3.

turbines can be found in Dr. Christopher Henning, “Sleep Disturbance and Wind Turbine Noise” (June 2009) (*Exhibit 18*) (“There can be no doubt that groups of industrial wind turbines (‘wind farms’) generate sufficient noise to disturb sleep and impair health of those living nearby.”).

Based on the foregoing, the Trust urges the DEP to reject the Application or at least defer action on the Project until the BEP holds a hearing on wind power noise, including the health effects of wind power noise, requested by the aggrieved parties in the Record Hill case. In addition, the Trust urges DEP to require the Applicant to disclose what it represented to the 10 land owners who gave a lease or easements about the effects of the Project on their health. Those easements and the lease should not be allowed as exemptions to the DEP noise regulations unless an adequate health disclosure was made.

C. Objections to the Decommissioning Plan.

The Application, in Section 29, proposes to begin funding a decommissioning fund in an amount of \$50,000 a year and then to evaluate the adequacy of the fund 15 years. This does not comply with the Wind Power Act, Section B-13. This provision requires “Decommissioning plans [to] include[] demonstration of *current and future financial capacity that would be unaffected by the applicant’s future financial condition* to fully fund any necessary costs commensurate with the project’s scale, location and other relevant considerations, including, but not limited to, those associated with site restoration and turbine removal.” [Emphasis added.] This statutory requirement was recommended in a paper submitted to the Governor’s Task Force on October 30, 2007 (See “Meeting Summaries” at the Governor’s Task Force Website) titled “State Siting Process For Grid Scale Wind Energy Facilities: Issues and Options.” Issue A-6, states: “Because a wind power project ... has real and potential effects on the natural environment, it is important to ensure that the project facility is properly decommissioned”

The paper then proposed the following option:

Develop a standardized state decommissioning policy, to be implemented regarding wind power, under which, as a condition of project approval, the applicant would establish a fully funded decommissioning account ... that would be unaffected by the applicant's future financial condition.
[Emphasis added.]

The Wind Power Act, like the proposal that the Wind Power Act adopted, thus requires a *pre-funded* decommissioning fund, not one established in the future that might be "affected by the applicant's future financial condition." By definition, any funding requirement in the future would be affected by the applicant's future financial condition. Not only is the requirement for pre-funding obvious from the wording of the Wind Power Act, but it makes eminent sense, as evidenced by the Decision of April 16, 2009 by the Vermont Public Service Board *In the Matter of Amended Petition of Deerfield Wind, LLC* at pgs 91-92, see *Exhibit 19*, requiring a Letter of Credit for the estimated decommissioning fund to be posted prior to construction.

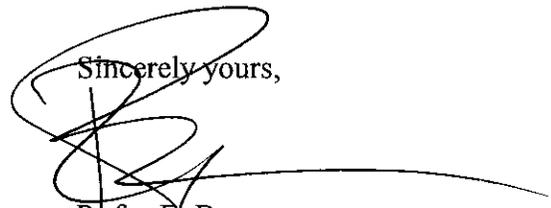
The Deerfield decision also disallowed a deduction for scrap metal salvaged as part of the decommissioning because "[s]crap value is vulnerable to market place volatility and thus should not be considered a viable funding source for decommissioning the Project." *Id.* at 91. The Applicant in this case deducts an enormous amount for scrap metal, \$17.5 million against total decommissioning cost of \$18.4 million. The Applicant should not be allowed any deduction for scrap and certainly not scrap at 95% of the cost. In addition, the Applicant should be required disclose how the \$17.5 million for estimated for scrap value was calculated.

D. Objections as to Affect on Property Values

The fourth ground that the Trust objects to is that the Project will reduce the property value of Trust property without compensation. A study published just weeks ago, *Wind Turbine*

Impact Study, by Appraisal Group One (September 9, 2009), *Exhibit 20*, showed that the value of property bordering a wind project reduces the value of unimproved land by 43%. The Applicant's private project should not be allowed at such a dramatic impact on bordering property without compensation.

For all of these reasons, the Trust urges DEP to deny the Application for the Project or at least defer approval of the Application all the previously described issues have been satisfactorily resolved.

Sincerely yours,

Rufus E. Brown

REB/

cc. Alex Powers
Philip Powers