

To: the State of Vermont Public Service Board

From: Nancy Tips, on behalf of Friends of Windham

Date: July 6, 2016

Re: Comments on Proposals Regarding Temporary Rule Making for Sound from Wind Generation Facilities

Friends of Windham is a non-profit organization in Windham Vermont. Our goal is to foster informed discussion about renewable energy in our town. We support Vermont's energy goals if they can be achieved without destroying our communities in the process. Renewable energy development must be collaborative and it must emphasize protection of existing environmental defenses against climate change. Current policies are heavy-handed, destructive, and unfair, and are thus creating a backlash among people who have long supported renewable energy. We hope that the rulemaking required by S.260 will be an opportunity for the PSB to listen to those who have been damaged by current practices, in which communities such as ours are blind-sided by powerful corporate interests, against which we are virtually defenseless. Our town has been, for four years, the target of Iberdrola Renewables, which seeks to place 20 3.45 megawatt turbines at close proximity to a majority of our homes. We are particularly concerned that the proposed installation would expose many of us to noise at levels that will make quiet use of our homes and properties impossible.

As regards the setting of noise standards, we call to your attention the 2011 paper, "The Problems with "Noise Numbers" for Wind Farm Noise Assessment" by Australian acoustician Bob Thorne. Thorne observes that "Wind farms and wind turbines are a unique source of sound and noise. The noise generation from a wind farm is like no other noise source or set of noise sources. The sounds are often of low amplitude (volume or loudness) and are constantly shifting in character ("waves on beach," "rumble-thump," "plane never landing," etc.). People who are not exposed to the sounds of a wind farm find it very difficult to understand the problems of people who do live near wind farms..." Thorne describes his observations, based on extensive monitoring, of unique characteristics of turbine noise. **Thumps:** Elevated low-frequency "thumps" experienced inside homes, generally 5000-6500 feet from turbines. Thorne points out that, while low-frequency sound and infrasound are normal characteristics of both turbines and of wind, the difference is that "normal" wind noise is smooth in effect whereas turbine noise is pulsing.

Noise is worse inside: Residents studied by Thorne often report that the low-frequency sound is

noticeably worse inside their homes than it is outside. Even more surprising and frustrating for some residents, "rooms in a residence can and will show significantly different characteristics. What may be inaudible or not perceptible in one room can be easily heard or perceived in another room on the same side of the house."

Sound modeling does not work due to variability in turbine noise levels. Thorne, like many other acoustics experts, stresses the wide variability in turbine noise levels at different times. He concludes that "wind farm noise level predictions can therefore only be considered as approximations and cannot be given any weight other than this." He noted that on any given day, background time-averaged (Leq) sound levels could vary significantly in comparison with the predicted sound level. Peaks of up to 20dB over the modeled levels can be expected. Thorne has monitored sound levels at many homes that are around a mile from wind installations. He notes that "**in 60 seconds the sound character varies regularly by more than 20 dB.**" He goes on to say: **Sound from wind farms can easily be heard at distances of 2000 meters (1.24 miles); such sound was measured...over the range 29 to 40 dB(A) with conditions of calm to light breeze. The sound was modulating and readily observed and recorded. The sound can be defined as being both unreasonable and a nuisance."** *Please note that some 200 Windham homes lie at a distance from turbines within which Thorne observed the sound to be both unreasonable and a nuisance.* Thorne's conclusion is that compliance criteria that are based on a single value are ineffective and unacceptable as protection from noise nuisance. "Current noise prediction models are simplistic, have a high degree of uncertainty, and do not make allowance for the sorts of variables and effects reported above."

We ask that any sound standard set by the PSB take into consideration the variability of sound over short time periods, and that any time-averaged measure be limited to 10 minutes or less. We agree with previous comments that current assumptions regarding sound attenuation by buildings are patently false, and that the standard should be an indoor, not-to-exceed limit of 30 dBA; allowable sound levels at an exterior façade should be such that the indoor standard can be maintained. Any outdoor standard should be consistent with the indoor standard and based on actual observations by disinterested experts, and it must be applied at property boundaries, not the façades of existing buildings. Turbine neighbors should be allowed quiet use of their properties, and should know that that the interior noise level in any structures on their properties will not exceed the 30 dBA indoor standard.

We also agree with previous comments that the PSB must require continuous noise monitoring, carried out by a third party approved by the community in which the turbines are located and supervised by the

Public Service Department. If the community or the PSD determines that the monitoring firm is not performing its job, either can require that the firm be replaced. When noise levels exceed allowable limits, turbine operations must be adjusted to achieve compliance or suspended until the turbines can resume operation within noise limits. We feel that violation of noise limits is a threat to public health and should be taken as seriously as any other environmental public health threat.

We thank you for this opportunity to comment.