Town of Richmondville

Wind Energy Facility Law

Noise Regulations

Ground Rules

- This meeting is to discuss a potential Wind Energy Facility Law for the Town of Richmondville.
- This meeting will focus on the noise aspects of a local law.
- Everyone needs to be respectful of different ideas and opinions.

Comments will be limited to the Town of Richmondville Residents, for five minutes each.

Overview of the Presentation

- Assessing and Mitigating Noise Impacts
- Options for regulating noise as part of a Wind Energy Facility Law

Assessing and Mitigating Noise Impacts

DEC Program Policy Document

Issued October 6, 2000, Revised February 2, 2001

Assessing and Mitigating Noise Impacts

- Noise – Any loud, discordant or disagreeable sound or sounds.

Noise

- Noise can be from fixed equipment or process operations
- Noise can be mobile equipment or process operations
- Noise can be generated from transport movements of products, raw materials or waste

Potential for Adverse Impacts

- Factors that influence the perception of sound
  - Distance
  - Surrounding terrain
  - Ambient sound level
  - Time of day
  - Wind direction
  - Temperature gradient
  - Relative humidity

Other Factors

- Amplitude (loudness)
- Frequency (pitch)
- Impulse patterns
- Duration of the sound

The combination of sound characteristics, environmental factors and the physical and mental sensitivity of a receptor to a sound determine whether or not a sound will be perceived as a noise.

Four Characteristics of Sound

- Sound Pressure Level – expressed in decibels
- Frequency – the rate at which the sound source vibrates or makes the air vibrate (pitch)
- Duration – recurring fluctuation in sound pressure
- Pure Tone – a single frequency

Equivalent Sound Level

The average sound energy over time

Environmental Setting and Effects on Noise Levels

- Sound Level Reduction over Distance
- Additive Effects of Multiple Sound Sources
- Temperature and Humidity
- Time of Year
- Wind
- Land Forms and Structures

Impact Assessment

- Evaluation of Sound Characteristics
  - Ambient noise level
  - Future noise level
  - Increase in Sound Pressure Level
  - Sharp and Startling Noise
  - Frequency and Tone
  - Percentile of Sound Levels
  - Expression of Overall Sound

Impact Assessment, continued

- Receptor Locations
- Thresholds for Significant Sound Pressure Level (SPL) Increase
  - Under 5 dB – unnoticed to tolerable
  - 5-10 dB – intrusive
  - 10-15 dB – Very noticeable
  - 15-20 dB – Objectionable
  - Over 20 dB – Very Objectionable to intolerable

Sound Impact Evaluation

- Exemption Criteria are met and no noise evaluation is required
- Noise impacts are determined to be non-significant (after first level evaluation)
- Noise impacts are identified as a potential issue but can be readily mitigated (after second level evaluation)
- Noise impacts are significant requiring analysis of alternatives as well as mitigation (third level evaluation).

First Level Noise Impact Evaluation

- Determine the maximum amount of sound created at a single point in time by multiple activities.
- Includes temporary construction phase as well as actual operations.
- Identify sound levels at receptor locations
  - Ambient noise levels
  - Project noise levels

Second Level Noise Impact Evaluation

- First Level is refined to factor in noise attenuation provided by topography, structures and vegetation
- If the potential for adverse noise impact still exists, then additional analysis are required.
  - A Equivalent Sound Level analysis or other analysis will be done.

Third Level – Mitigation Measures

- Explore options for mitigation of significant noise effects
- Explore project options to reduce noise effects

Mitigation Measures – BMP's

- Reduce noise frequency and impulse noise
- Reduce noise duration
- Reduce noise sound pressure levels

Sound Analysis

A couple of samples

Options for Regulations that relate to noise

- Hire a consultant, either a law firm or an engineering firm, or some combination of the two
- Use a model as drafted by another entity such as Planning and Development Agency, NYSERDA
- Other local laws from Towns throughout New York State
- Do Nothing

Section 16 – Setbacks and Noise

B. The statistical sound pressure level generated by a wind turbine shall not exceed L50 - 40 dBA measured at the property lines located off the site. Sites can include more than one piece of property and the requirement shall apply to the combined properties. Independent verification by an acoustical engineer certified with the Institute of Noise Control Engineering shall be provided before and after construction demonstrating compliance with this requirement.

Section 16 – Setbacks and Noise

- C. In the event audible noise due to wind energy facility operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in subparagraph (B) of this subsection shall be reduced by five (5) dBA. A pure tone is defined to exist if the one-third (1/3) octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two (2) contiguous one third (1/3) octave bands by five (5) dBA for center frequencies of five hundred (500) Hz and above, by eight (8) dBA for center frequencies between one hundred and sixty (160) Hz and four hundred (400) Hz, or by fifteen (15) dBA for center frequencies less than or equal to one hundred and twenty-five (125) Hz.

Section 16 – Setbacks and Noise

- D. Should the ambient noise level (exclusive of the generated by operating energy facility in question) exceed the applicable standard given §16.B the applicable standard shall be increased the ambient dBA plus 5 dBA. The ambient noise level shall be determined by measuring the highest whole number sound pressure level, expressed in dBA, which is exceeded for more than six (6) minutes per hour. Ambient noise levels shall be measured at the exterior of potentially affected existing residences, schools, hospitals, churches and public buildings. Ambient noise level measurements shall be performed when wind velocities at the proposed project site are sufficient to allow wind turbine operation.

Town of Meredith Local Law No. 4 of 2007

- Section 303 Physical Standards for Wind Energy Facilities
  - 17. The statistical sound pressure level generated by a WECS shall not exceed the ambient decibel level, both A-weighted and C-weighted, plus 5 decibels measured anywhere along the site boundary. Sites can include more than one piece of property and this requirement shall apply to the combined properties. Ambient sound level measurements shall employ all practical means to reduce or compensate for the effect of wind generated noise artifacts at the microphone so as to measure the actual sound level most accurately. Ambient sound level measurements should be performed when wind velocities aloft are sufficient to allow wind turbine operation and should report ambient sound levels for wind speeds aloft corresponding to turbine cut-in as well as the wind speed aloft corresponding to production of the greatest noise. The sound pressure level at off-site residences shall not exceed ambient sound plus 5 decibels, both A-weighted and C-weighted, as determined in accordance with the stipulations of Section 301 (A)(14)(d) of this local law. Independent verification by an acoustical engineer certified with the Institute of Noise Control Engineering shall be provided before and after construction to demonstrate compliance with this requirement.

Wind Energy Facility Law

- Town of Eagle – Local Law No. B of 2005
  - Section 7 – Noise – Wind Energy Conversion Facilities shall be operated so that the noise produced during operation shall not exceed fifty (50) dBA, measured at residential structures on parcels owned by persons not having a lease or noise easement with the project developer or owner.

Wind Energy Facility Law

- Will work in conjunction with the SEQRA review process for large and small projects
- The language for Wind Energy Facility Laws is developing over time. Adopted Local Laws and case law from Court decisions around the State shape the next generation of Local Laws.

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