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Memorandum

To: BNE Energy, Inc.

Date: March 2, 2011

Project No.: 41604.01

From: Thomas Wholley, Director of Air Quality and Noise Services

Re: Connecticut Siting Council Noise Questions

The purpose of this document is to provide responses to the Connecticut Siting Council's (Council) questions on the relationship of wind speed to sound levels, and the affect of background sound levels on project sound levels.

Wind Speed

The October 2010 Noise Report presented Project Daytime and Nighttime sound levels that are based upon the assumption of a daytime wind speed of 9 meters per second (m/s) and a nighttime wind speed of 8 m/s. These sound levels, which are presented in Table 5 (October 2010 Noise Report) below, represent sound levels generated by the wind turbines. All of these sound levels meet the corresponding daytime and nighttime noise impact criteria.

The Project Daytime and Nighttime sound levels for each receptor location are calculated based upon projecting the wind turbine base sound levels to the distances to the receptor locations. The wind turbine base sound level is 104 dBA for a wind speed of 8 m/s and the wind turbine base sound level is 106 dBA for a wind speed of 9 m/s or greater. These sound levels are projected to the receptor locations and are reduced as they travel from the wind turbine to the receptor locations over distances.

Table 5
Project Generated Sound Levels, L_{90} (dBA)

Receptor Location*	Daytime Noise Criteria**	Project Daytime Sound Levels	Nighttime Noise Criteria**	Project Nighttime Sound Levels
R1 – Kluge Road	61	45	51	43
R2 – New Haven Road (Route 69)	61	46	51	44
R3 – New Haven Road (Route 69)	61	46	51	44
R4 – New Haven Road (Route 69)	61	45	51	43
R5 – Talmadge Hill Road	61	29	51	27
R6 – Valley Lane	61	31	51	29
R7 – Cheshire Road (Route 42)	61	25	51	23
R8 – Lacey Road	61	26	51	24
R9 – Coachlight Circle	61	30	51	28
R10 – Putting Green Lane	61	28	51	26

* Refer to Figure 1 for receptor locations.
** Source /Emitter Zone (Industrial) to Listener/Receptor Zone (Residential (Class A))

The Council asked what the sound levels would be if the nighttime wind speeds was also assumed to be 9 m/s. In that case, the sound levels would be the same as the daytime sound levels presented in Table 5. Since the sound levels at receptor locations are a function of wind speed and distance to the receptor locations, if only the wind speed changes to 9 m/s and the distances remain the same, the base wind turbine sound levels for the nighttime will be 106 dBA, which is then projected over the distances to the receptor locations. This is exactly the same analysis condition for the Project Daytime Sound Levels presented in Table 5. **The same wind speed and same distances will result in the same Project Sound Levels for the daytime and nighttime conditions.** The background sound levels were not included in the calculations for the Project Daytime or Nighttime sound levels because the noise impact criteria calls for project generated sound levels only (see background sound level discussion below).

The state accounts for the difference from daytime to nighttime by lowering the noise impact criteria for nighttime, to reflect greater sensitivity to noise. The daytime noise impact criteria is 61 dBA, the nighttime impact criteria is 51 dBA. The maximum daytime and nighttime sound levels generated by the proposed Prospect Wind Turbine project at 9 m/s are presented in Table 5 REVISED below. The maximum sound levels generated by the proposed Prospect Wind Turbine project at 9 m/s is 106 dBA which results in sound levels at the receptor location s that meet both the daytime and nighttime noise impact criteria.

Table 5 REVISED
Project Generated Sound Levels, L_{90} (dBA)

Receptor Location*	Daytime Noise Criteria**	Project Daytime Sound Levels	Nighttime Noise Criteria**	Project Nighttime Sound Levels
R1 – Kluge Road	61	45	51	45
R2 – New Haven Road (Route 69)	61	46	51	46
R3 – New Haven Road (Route 69)	61	46	51	46
R4 – New Haven Road (Route 69)	61	45	51	45
R5 – Talmadge Hill Road	61	29	51	29
R6 – Valley Lane	61	31	51	31
R7 – Cheshire Road (Route 42)	61	25	51	25
R8 – Lacey Road	61	26	51	26
R9 – Coachlight Circle	61	30	51	30
R10 – Putting Green Lane	61	28	51	28

* Refer to Figure 1 for receptor locations.
** Source /Emitter Zone (Industrial) to Listener/Receptor Zone (Residential (Class A))

Background Sound Levels

The Council asked what affect the background sound levels might have on the projected nighttime sound levels with the proposed wind turbines. The background sound levels have no effect on the maximum wind turbine sound levels for either the Project Daytime or Nighttime conditions because the Project Daytime and Nighttime Sound Levels are based upon the base wind turbine sound level for a specific wind speed projected to the receptor locations by distances. The Connecticut Daytime and Nighttime Noise Impact Criteria are based upon project generated sound levels only. The background sound levels were collected to determine if Sec. 22a-69-3.6., "High Background Noise Areas," applied.

The Regulations of Connecticut State Agencies (RCSA) Sec. 22a-69-3.6., "High Background Noise Areas," allows areas with background noise levels caused by sources not subject to these regulations that exceed the noise impact criteria, to have revised noise impact criteria of 5 dBA higher than the measured background noise levels. The measured daytime sound levels in Prospect ranged from 41 dBA to 44 dBA and the nighttime sound levels ranged from 35 dBA to 38 dBA under low wind conditions. Studies have indicated that increases in wind from low wind speeds to high wind speeds could result in increases in sound levels of approximately 5 dBA. Therefore, the background sound levels in Prospect during wind speeds of 9 m/s would be expected to be approximately 5 dBA higher than the sound levels measured during low wind conditions. Since the background sound levels for Prospect would be expected to still be below the daytime and nighttime noise impact criteria, no change in the noise impact criteria could be allowed and the background noise monitoring data was only used to provide a sense of the existing sound levels in the study area.