

**STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL**

**Petition of BNE Energy Inc. for a  
Declaratory Ruling for the Location,  
Construction and Operation of a 3.2 MW  
Wind Renewable Generating Project on  
Flagg Hill Road, Colebrook  
Connecticut (“Wind Colebrook South”)**

**Petition No. 983**

**March 15, 2011**

**PRE-FILED TESTIMONY OF MICHAEL LIBERTINE, LEP**

Q1. Please summarize your professional background and experience.

A. I am a Licensed Environmental Professional and the Director of Environmental Services and a Principal at Vanasse Hangen Brustlin (VHB). I have 25 years of professional experience, including over 18 years of engineering consulting in the environmental field. My experience includes land use and regulatory permitting, environmental due diligence, site assessment and field investigations for property transfers, remedial strategy development, environmental assessment for NEPA compliance, RI/FS investigations, Brownfields redevelopment projects and remedial investigations of RCRA facilities, state and federally recognized hazardous waste sites, and Manufactured Gas Plant (MGP) sites. I have appeared as a witness before the Connecticut Siting Council in several proceedings related to energy projects and telecommunications facilities. My resume is attached hereto as Exhibit 1, which details my qualifications and experience.

Q2. What services did VHB provide BNE Energy regarding Wind Colebrook South?

A. BNE Energy Inc. (“BNE”) retained VHB to assist in preparing an environmental assessment of the proposed wind generating project off Flagg Hill Road in Colebrook, including visibility evaluation, shadow flicker analysis, wetland delineation, terrestrial wildlife habitat evaluation, and state agency consultations. I oversaw these activities associated with Wind Colebrook South.

Q3. What is the purpose of your testimony?

A. The purpose of my testimony is to provide information regarding the visual resource evaluation, shadow flicker analysis, and consultation with the State Historic Preservation Office.

Q4. Please summarize the methodology used to assess the potential visibility of Wind Colebrook South.

A. Since the initial BNE filing, which included a Visual Resource Evaluation Report (Exhibit J), VHB prepared a Supplemental Visual Resource Evaluation (included herein as Exhibit 2) that assesses the use of 82.5-meter diameter blades at a hub height of 100 meters. The initial analysis used a 100-meter blade diameter. The Supplemental Visual Resource Evaluation

Report, which includes the assessment methodology and findings, viewshed maps, and photo-simulations, is provided as Exhibit 2.

To represent the visibility of the proposed turbines, VHB used a predictive computer model to assess potential visibility throughout a 5-mile radius Study Area. Project- and Study Area-specific data were incorporated into the computer model, including turbine and blade heights, turbine locations and ground elevations, underlying and surrounding topography, proposed Project clearing limits, and existing vegetation. Once these specific data layers were entered into the model, VHB calculated those locations where the turbines could be visible.

Q5. Please summarize the results of the Supplemental Visual Resource Evaluation for year-round visibility.

A. The analysis demonstrates that the areas where at least one of the proposed turbine hubs could be visible above the tree canopy year-round (that is, during both “leaf-on” and “leaf-off” conditions) comprise approximately 254 acres within five miles (representing less than 0.05% of the 52,560-acre Study Area). At its apex, the blade(s) may be visible above the tree canopy from approximately 457 acres (less than 1 percent of the Study Area). The majority of potential year-round views of the turbine hub would occur on the Property and its immediate environs, including portions of the adjacent rod and gun club (to the north) and Nature Conservancy (westward) properties; as well as select locations along Route 44 within approximately two miles of the Project; higher elevations to the north; and, Lake Winchester and higher elevations to the south.

Views would be limited westward beyond the adjacent Nature Conservancy woodlands due to the presence of significant ridgelines. Similar conditions exist to the east. Two state-scenic roads exist within the Study Area including portions of Route 183 in Colebrook and Route 272 in Norfolk. No views are anticipated from these areas. Winchester Road in Norfolk is designated as a local scenic road; brief views may be achieved from an open height of land along this road approximately 2 miles southwest of the Project. Similarly, Winchester Road in Winchester (Winsted) is also designated as a local scenic road; no views are anticipated from this roadway. Haystack Mountain State Park, located approximately four miles to the northwest includes several hiking trails and an observation tower. No views are anticipated from the trail system on Haystack Mountain; however, views of the turbines would be achieved from the observation tower lookout. Dennis Hill State Park, located approximately 2.5 mile southwest of the Property Trail, has a system of hiking trails; no views of the Project are anticipated from this area. Algonquin State Forest lies approximately 4 miles to the east of the Project Site; there is no formal trail system within the forest. Winsted Soldiers Memorial, located approximated 4.5 miles to the southeast, maintains an elevated monument with views to the west; views of the Project would be achieved from this location.

We estimate approximately 35 residential properties within one mile of the Property may have at least partial views of the Project’s turbine(s) hub(s) during “leaf-on” conditions. Approximately 45 additional properties within one mile could have views of the blade(s) at its apex above the trees. It is important to note that some of those properties identified as “residential” may be occupied by either commercial or recreational structures; agricultural land; and/or, forested tracts with some clearing(s).

Q6. Please summarize the results of the Visual Resource Evaluation for seasonal visibility.

A. We estimate that approximately 1,327 acres (representing about 2.5% of the Study Area) have the potential to offer some views of the turbine hubs through the trees during “leaf-off” conditions. Most of the potential seasonal visibility (about 75%) occurs on and within approximately one mile of the project site. Approximately 16 residential properties within one mile of the Project site could have at least partial views of the turbine(s) hub(s) through the intervening trees during “leaf-off” conditions.

Q7. Please describe potential visibility from points of interest beyond the 5-mile Study Area.

A. Areas within five miles of the Project were selected as the Study Area to identify those locations where views of the turbines might be considered prominent features in the landscape. Locations beyond five miles away with direct lines-of-sight may also have some views of the turbines; however at those distances, it is my opinion that the Project would not be considered prominent on the horizon. That said, the following points of interest were identified beyond 5 miles:

**Points of Interest Beyond Five Miles**

<b>Location</b>	<b>Elevation</b>	<b>Distance</b>	<b>Comment</b>
Ivy Mountain State Park	1655 Ft. AMSL	± 7.5-Miles	Wooded summit
Peoples State Forest	1087 Ft. AMSL	± 7.1-Miles	Vistas along Jessie Gerard Trail with potential aspect towards proposed Turbines
American Legion State Forest	1112 Ft. AMSL	± 6.3-Miles	High Point within western portion of American Legion SF; no vistas in this area
Paugnut State Forest	1316 Ft. AMSL	± 7.8-Miles	No information on public trails/vistas; Appears heavily wooded
Canaan Mountain	1755 Ft. AMSL	± 9.0-Miles	No information on public trails/vistas; Appears heavily wooded
Rattlesnake Hill	1150 Ft. AMSL	± 9.8-Miles	No public trails; named topographic feature
Bald Mountain	1760 Ft. AMSL	± 5.6-Miles	No public trails; named topographic feature
Tunxis State Forest	1420 Ft. AMSL	± 8.5-Miles	High point in Tunxis SF; unnamed trail in vicinity; appears wooded
Bear Mountain (AT)	2316 Ft. AMSL	± 17.0-Miles	Open views from stone pile at summit, but well outside of study area
Gridley Mountain	2170 Ft. AMSL	± 17.3-Miles	No public trails; named topographic feature
Mount Everett (AT)	2624 Ft. AMSL	± 17.5-Miles	Open views from summit, but well outside of study area
Mount Race (AT)	2365 Ft. AMSL	± 16.9-Miles	Open views from exposed outcrops, but well outside of study area
College Hill	1560 Ft. AMSL	± 5.4-Miles	No public trails; named topographic feature
<b>1270 Ft. AMSL</b>	1270 Ft. AMSL	± 9.1-Miles	Unnamed high point to the SW of proposed site; No public trails; unnamed topographic feature
<b>1730 Ft. AMSL</b>	1730 Ft. AMSL	± 6.0-Miles	Unnamed high point to the SW of proposed site; No public trails; unnamed topographic feature

Q8. Please summarize the methodology used to assess shadow flicker resulting from the Project.

A. VHB prepared a shadow flicker analysis using the SHADOW module of WindPRO software, a widely-accepted modular-based software package developed by EMD International and designed specifically for the planning and evaluation of wind power projects. The software model can determine the duration of shadow flicker experienced at a specific viewing (or “receptor”) location, by using a geometric analysis which accounts for the relative positions of the sun (throughout the time of year and day), the locations of the wind turbines, and the viewing location. A distance of 2,000 meters (6,561 feet or about 1.3 miles) from the wind turbine locations was used as the Study Area; this is the default distance incorporated into the WindPRO software.

VHB first conducted a “worst case” analysis, using the software’s “greenhouse” mode, which incorporates several conservative simplifications, including but not limited to:

- An assumption that the sun is shining with no obstructions during all daylight hours;
- The wind is blowing during all daylight hours at sufficient speed to rotate the turbine, and therefore, the turbines are spinning all day;
- Each “receptor” location (i.e., occupied building) is assumed to have windows facing the turbines).
- The software’s “greenhouse” mode sensors can see in all directions, as if the receptor were an entirely glass structure (similar to a greenhouse), with no obstructions to block incoming shadow light. This assumes occupants of all receptors would see a shadow regardless of the direction from which it was coming.

A 50% reduction factor was applied to the worst-case calculations to represent a more realistic, or “probable case” scenario. The 50% reduction was based on a combination of cloudy days (the annual average percentage of cloudy days in Colebrook is 45%) plus additional atmospheric and operational conditions that inhibit or mitigate the casting of shadows.

Q9. Please summarize the results of the shadow flicker analysis.

A. The analysis of potential shadow flicker impacts from the Project on nearby receptors demonstrates low occurrence of flicker throughout the majority of the Study Area. Of the 75 receptor locations evaluated, a total of seven receptors are predicted to have some shadow flicker events (representing 9% of the total locations within the Study Area). Annual shadow flicker durations range from nearly 10 hours to over 48 hours. One receptor is predicted to experience more than 30 hours per year; three receptors are predicted to experience between 20 and 30 hours; and three receptors between approximately 10 and 17 hours annually. The receptor predicted to experience more than 30 hours annually is the residence located on the Property at 17 Flagg Hill Road.<sup>1</sup>

The neighboring property at 29A Flagg Hill Road is predicted to experience approximately 27.5 hours of shadow flicker resulting from Turbine 1. Two additional receptors are forecasted to experience shadow flicker between 20 and 21.5 hours; these receptors are located at 8 Flagg Hill Road (receptors L and M on Figure 1), southeast of the intersection of Flagg Hill Road and Route 44. Across Route 44 to the east/northeast, three additional receptors are predicted to experience shadow flicker between

---

<sup>1</sup> The 17 Flagg Hill Road property is owned by the principals of BNE.

approximately 10 and 17 hours annually. Turbine 2 appears to be the unit that most influences shadow flicker at these receptors, this turbine would be located at distances ranging from approximately 1,280 to 1,790 feet away. Contribution from Turbine 1 is expected to occur at one receptor (L) for about a four week period (December-January); Turbine 1 is located approximately 2,440 feet from this receptor. Based on a review of the WindPRO SHADOW Calendar calculations, shadow flicker would occur in the late afternoon, generally within one to two hours before sunset, when the sun is low on the horizon. On any given day when shadow flicker is predicted to occur, it appears that the duration of the effect would last less than one hour.

A Supplemental Shadow Flicker Analysis is provided as Exhibit 3.

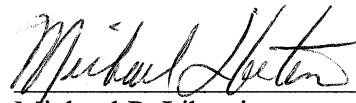
Q10. Please comment on your consultations with the State Historic Preservation Office (SHPO).

A. BNE corresponded with the Connecticut SHPO regarding the Project in September 2010 and submitted a Cultural Resources Map (depicting known historic/archaeological resources within one mile of the Project, based on data obtained from publicly-available sources). The Cultural Resources Map is provided solely as a courtesy to the SHPO and does not constitute a regulatory determination of any kind. It is the responsibility of the SHPO, which maintains its own records of NRHP properties in the state, to determine whether there will be any effect on cultural resources. The SHPO review resulted in the issuance of a "no effect" letter on November 29, 2010.

The statements above are true and accurate to the best of my knowledge.

3-15-11

\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Michael P. Libertine

# **EXHIBIT 1**

## Michael Libertine, LEP

.....  
Environmental Services

.....  
Mr. Libertine is a Licensed Environmental Professional in Connecticut. His primary responsibilities at VHB are managing and overseeing the environmental science and engineering projects in our Middletown, Connecticut office. His experience includes regulatory compliance and permitting, site assessments and field investigations for property transfers, remedial strategy development, environmental due diligence, environmental assessments for NEPA compliance, RI/FS investigations, Brownfields redevelopment projects, and remedial investigations at RCRA facilities, state and federally recognized hazardous waste sites, and Manufactured Gas Plant (MGP) sites. Mike has been Project Manager on over 1600 environmental site assessments (ESAs) and field investigations for property transfers in Connecticut, Rhode Island, New Hampshire, Massachusetts, Vermont, New Jersey, New York, Washington, D.C., Florida, Kansas, and Canada. Representative projects are summarized below.

### Environmental Services for Wireless Telecommunications Clients, New England

Program Manager for environmental due diligence and permitting services in support of various telecommunications clients throughout New England and New York. Mr. Libertine has worked directly with the major licensed PCS carriers since 1997. Project management includes coordination and oversight of preliminary site screenings, compliance documentation and environmental assessments to fulfill NEPA requirements, land use evaluations, Phase I ESAs, Phase II field investigations, remedial planning and oversight, wetland assessments, vegetative/biological surveys, noise analyses, visual resource analyses, graphic support, preparation of regulatory applications and permitting support. Mr. Libertine has testified on behalf of telecommunications clients in front of local municipalities and the Connecticut Siting Council on over 300 applications.

### On Call Environmental Services, Northeast Utilities Transmission Group

Program Manager in support of various Connecticut projects, including assessment and permitting of bulk power substations, transmission lines/structures, and underground utility installations. Services include conducting civil engineering feasibility studies, pre-acquisition due diligence evaluations, natural resources inventories of existing flora and fauna, habitat evaluations, wetland delineations, noise analysis, hazardous waste investigations, site survey, layout and design drawings, landscape architecture, preparation of technical documents, coordination with State and local agencies, regulatory permitting, public outreach, and expert witness testimony. Under this contract, VHB has assisted this client in the siting, design and permitting of five substations, a transition station, and transmission line corridor studies since 2004, as well as numerous land surveys, land development feasibility studies, field investigations, and wetland studies.

### Certificates of Environmental Compatibility and Public Need, Electrical Substations, Connecticut

Project Manager in support of Applications to the Connecticut Siting Council (CSC) for the permitting of four new 345/115 kV substations in Killingly, Guilford, Waterford and Westport, Connecticut. These projects required extensive coordination of numerous team members, including client's in-house discipline managers and engineers, consultants, legal counsel, VHB staff, and subcontractors. Mike was responsible for overseeing pre-acquisition environmental due diligence services, site survey, site data collection and analysis, site/civil layout, and drafting of municipal documents and the Application to the CSC. Services included conducting natural resources inventories of existing flora and fauna, habitat evaluations, wetland delineation, noise analyses, hazardous waste investigations, site layout and design drawings, landscape architecture, preparation of technical documents, coordination with State and local agencies, and permitting. His team has also prepared Development and Management Plans to the CSC and provided environmental monitoring for adherence to the CTDEP's General Permit for Construction Activities and environmental requirements set forth in the Client's contract documents and specifications.

Mr. Libertine is Director of Environmental Services for VHB's Middletown, CT office. A Licensed Environmental Professional, Mike has over 25 years of professional experience, including eighteen years of engineering consulting in the environmental field. His primary responsibilities involve coordination and oversight of environmental science and engineering projects in the company's Connecticut office, including environmental regulatory permitting, environmental assessments, environmental assessments, site assessments for property transfers, and due diligence and permitting in support of development projects.

### **Regulatory Permitting, Barbour Hill Substation Modifications, South Windsor, Connecticut**

Project Manager responsible for the preparation of a Petition to the Connecticut Siting Council for a determination that no Certificate of Environmental Compatibility and Public Need was required for the proposed modifications to the Barbour Hill Substation in South Windsor, Connecticut. The project included the replacement and expansion of an existing facility and the modification of line interconnections. Responsibilities included conducting natural resource inventories, wetland delineation, noise study, soil and groundwater sampling, property survey, preparation of site/civil design drawings, supporting graphics, photo-simulations, and local and state permit documents. Under Mr. Libertine's supervision, VHB also supported CL&P during its contractor selection process and developed a site-wide soil and water management plan for implementation during construction activities.

### **Environmental Impact Evaluation for Great Path Academy, Manchester, CT**

Project Manager of an Environmental Impact Evaluation (EIE) for expansion of a middle-college magnet high school serving eight member communities and operating within existing infrastructure at Manchester Community College (MCC). The proposed action included a new free-standing facility on the campus to house the school and expand parking to accommodate 500 additional vehicles to enable enrollment to increase from 75 to 300 students. Services included the preparation of the EIE in accordance with the Connecticut Environmental Policy Act to evaluate the project's associated potential environmental, social and economic impacts. Mike and his staff produced a comprehensive document, distributed for public review and comment, that assessed multiple potential sites for parking and building facilities within the MCC campus, as well as "no action" alternatives for parameters including: hydrology, traffic, visual impact on the surrounding community, energy consumption, and impacts to wildlife and habitat, potential historic and archaeological resources, forested areas, and a State-designated Greenway bike path. The result of the process was securing a Finding of No Significant Impact. The project required extensive coordination with the CTDPW, Board of Technical-Community Colleges, and MCC representatives.

### **Environmental Site Assessments & Pilot Grant Closure, Middletown, CT**

Project Manager for environmental site assessments associated with the City's Riverfront Revitalization Project utilizing the remaining funds from USEPA Brownfields Demonstration Pilot Grant #BP99103401. Completed Phase I ESAs for 101 properties and Phase II investigations for 14 properties under this grant, as well as preparing EPA-required Quality Assurance Protection Plans (QAPP). Completed EPA required grant closure documentation for all investigations conducted under this grant.

### **Remedial Investigations, Former Remington Rand Facility, Middletown, CT**

Project Manager of Remedial Investigations at former industrial manufacturing complex to determine nature and extent of soil/groundwater contamination, remedial alternatives, and their associated costs in preparation for adaptive site reuse. This project required coordination with the City of Middletown, the Connecticut Department of Economic and Community Development and the CTDEP as part of the Urban Sites Redevelopment-Brownfields Program.

### **EA/FONSI for State Routes 7 & 15 in Norwalk and Wilton, CT**

Project Manager of Final Environmental Assessment/Section 4(f) Evaluation (EA) for Finding of No Significant Impact (FONSI) on two state projects along Routes 7 and 15 in Norwalk and Wilton, Connecticut (1998-1999). These projects, completed for ConnDOT, involved the evaluation of seven different build/no build alternatives involving two interchanges and a proposed freeway extension. The evaluation included assessments of current conditions, potential impacts of alternatives, analysis of impacts associated with proposed actions, and development of mitigation techniques to be employed during design and construction. The Final EA document was submitted to the Federal Highway Administration, which provided a determination of FONSI in March 2000.

### **On-Call Services for Connecticut Department of Transportation**

Task Manager for ConnDOT On-Call Environmental Services contract (1993-1997). Project task



management included coordination and oversight of corridor land use evaluations, preliminary site evaluations, surficial and exploratory site investigations, and emergency response procedures. Representative projects included identification and characterization of hazardous materials, chemicals, and oils within ConnDOT highway project areas.

#### **Environmental Review and Redevelopment Planning, Stratford, CT**

Project Manager supporting the Town of Stratford in assessing the feasibility of redeveloping the Stratford Army Engine Plant, which was closed under the Military Base Closure Act of 1997. The facility included over 2 million sq. ft. of space in approximately 40 buildings on a 50-acre site along the Housatonic River waterfront. This project required close coordination with the Client, VHB Planners and a socioeconomic sub-consultant to assist the town with the required steps to redevelop this industrial/military site. The planning process included the assessment of existing buildings, environmental and regulatory constraints associated with industrial site redevelopment, and an analysis of alternative reuse options for community benefits and impacts. A preferred redevelopment approach was created which included significant building demolition, site cleanup, and infrastructure upgrades. VHB completed preliminary plans and remediation cost scenarios for the decontamination/demolition of site structures, schematic waterfront park layout in consideration of environmental compliance issues, roadway and drainage design, and utility modification. A green space and waterfront park, providing recreational opportunities and public access to Long Island Sound, was completed in 2001.

#### **Garment Facility, Norwich, Connecticut**

Project Manager for solvent-contaminated soil remediation at former garment manufacturing facility. In addition to soil contamination associated with historic discharges to a dry well, this project also involved site characterization and removal of diesel and waste oil UST's impacted soils, initiation of ongoing quarterly groundwater monitoring programs, and coordination with the CTDEP Property Transfer Program.

#### **Commercial Property, Warwick, RI**

Project Manager of environmental site investigations, remedial design, and oversight at a commercial property. This project involved completion of a Phase I site assessment, Phase II field investigations, soil gas survey, UST testing and removals, geophysical survey, septic system survey/assessment, environmental compliance and property transfer issues, preparation of a Corrective Action Plan for submission to the Rhode Island Department of Environmental Management (RIDEM), site remediation of petroleum-impacted soils, and submittal of a closure report.

#### **RCRA facility investigation, Kansas**

Field Team Leader for a RCRA facility investigation at a cement factory in Kansas that burns hazardous waste-derived fuels. This project includes investigation on the extent and degree of contamination due to releases of hazardous constituents at eight solid waste management units. These include three landfills, waste treatment ponds, fuel storage areas, and miscellaneous waster transfer systems. Responsibilities also include the preparation of the Phase I Field Investigation technical report, the Phase II Work Plan for EPA review, and the Phase II Field Investigation technical report.

#### **MGP Sites, New York**

Performed groundwater, surface and subsurface soils sampling activities for Remedial Investigation/Feasibility Studies (RI/FS) at over 10 MGP sites in New York State, Pennsylvania, and Vermont. The majority of these programs were conducted under State regulatory overview while another was conducted under EPA Region II overview.

#### **Installation/Restoration Study, Naval Submarine Base, Groton, CT**

Assisted on a field investigation for an Installation/Restoration Study at the Naval Submarine Base in Groton, Connecticut for the U.S. Navy. This Superfund site includes RI/FS investigations at four former waste disposal/release site and several additional potential waste disposal sites.

**Publications**

*The Newly Adopted Connecticut Remediation Standard Regulations Coincide with Brownfields Legislation,*  
February 1996, Brogie, Martin and Libertine, Michael.

.....

**Education**

University of Connecticut, B.S. Natural Resources Management,  
December 1990  
Stonehill College, B.A. Marketing, May 1981

**Certifications/  
Licenses**

Licensed Environmental Professional, State of Connecticut,  
LEP No. 345  
OSHA Hazardous Waste Operations and Emergency Response  
(HAZWOPER) Training (29 CFR 1910.120)

# **EXHIBIT 2**

**Due to the size of this document, an electronic version  
will be filed with the Siting Council on disk.**

# **EXHIBIT 3**

**Due to the size of this document, an electronic version  
will be filed with the Siting Council on disk.**