

Environmental Assessment

**Brewster Wind Energy Project
Brewster, Massachusetts**



**U.S. Department of Agriculture
Rural Utilities Service (RUS)**

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Prepared for:

**Cape and Vineyard Electric Cooperative
3195 Main Street
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**ENVIRONMENTAL REPORT
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ESS Project No. W279-000.1

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1.0 EXECUTIVE SUMMARY

The Project Proponent is the Cape & Vineyard Electric Cooperative, Inc. (CVEC), a Massachusetts cooperative whose members are certain towns and governmental entities in Barnstable and Dukes County, Massachusetts. CVEC's purposes include developing and/or owning renewable energy generation facilities and procuring and/or selling long-term electric supply or other energy-related goods or services to its members.

CVEC has proposed the development of a community-scale wind energy project consisting of two land based wind turbines to be sited on municipally owned land in the CVEC member Town of Brewster, Massachusetts.

The Rural Utilities Service (RUS) is considering providing financial assistance to CVEC to construct the Brewster Wind Energy Project.

2.0 INTRODUCTION

CVEC has proposed the development of a wind energy facility (Project or Proposed Project), to be sited on Town of Brewster-owned property; Freeman's Way Industrial Park; off of Commerce Park Road, within a zoned industrial area in Brewster, Massachusetts. The Project proposes to install two, 1.80 megawatt (MW) turbines of three-bladed, upwind, horizontal axis, rotor mounted atop a monopole tower design, with a maximum height of 410 feet. The Town of Brewster (Town of Brewster or Town) would be the primary user of the electricity generated by the two turbines. The remainder of the electricity produced would be allocated to CVEC members in accordance with the Massachusetts net metering law, G.L. c. 164, §§ 138-140 and the Massachusetts Department of Public Utilities Net Metering Regulations codified at 220 CMR 18.00.

CVEC is applying for financial assistance to construct the Project from the RUS. Approval of CVEC's request is considered to be a federal action subject to environmental review under the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality's regulations implementing NEPA (40 CFR Parts 1500-1508) and the RUS NEPA implementing regulations (7 CFR Part 1794).

This Environmental Report (ER) provides an analysis of potential environmental impacts that may result from RUS's action related to the construction and operation of the Project. RUS Bulletin 1794A-601, "Guide for Preparing an Environmental Report for Electric Projects Requiring an Environmental Assessment," was used as guidance in the preparation of this ER. In addition to fulfilling its obligations under NEPA, this ER also documents RUS's compliance with Section 106 of the National Historic Preservation Act (NHPA), Section 7 of the Endangered Species Act, and other applicable environmental laws, regulations, and executive orders.

The RUS has determined that the Project requires the preparation of an Environmental Assessment (EA) in accordance with 7 CFR § 1794.23(c)(3). RUS has completed an independent analysis of the ER and concurs with its scope and content. In accordance with 7 CFR 1794.41 RUS has adopted this ER as its EA for the Proposed Project.

3.0 PROJECT DESCRIPTION

3.1 Project Purpose and Need

The purpose of and need for the Project is to provide power for the Town of Brewster to offset its electrical expenses and to showcase renewable energy projects for surrounding towns located on Cape Cod and the island of Martha's Vineyard. The Project would also help meet the needs of other municipalities on Cape Cod and Martha's Vineyard that are seeking to lower their municipal energy bills. The net metering credits resulting from the two wind turbines would provide crucial savings to these municipalities that would also assist in addressing strained municipal budgets. CVEC intends to net meter the wind turbines, with the intent to allow the Town to net meter its entire electrical load. The Town receives electricity under various accounts provided by the local distribution company; NSTAR; and has a municipal load estimated at 2.645 million kilowatt hours annually. Other CVEC member towns would also receive net metering benefits. The Massachusetts Green Communities Act and the implementing regulations promulgated by the Massachusetts Department of Public Utilities allow local distribution companies to either allocate net metering credits against future energy bills as designated by CVEC (e.g., allocation to municipal energy accounts) or to purchase those net metering credits in lieu of allocation by issuing a check.

The Renewable Energy Credits (RECs) associated with the Project would be sold by CVEC to the Cape Light Compact¹ (Compact) pursuant to an Intergovernmental REC Agreement and would ultimately benefit CVEC and Compact members. A REC means, with respect to each certificate, all of the environmental and other non-energy attributes, value, and credits of any kind and nature associated with one Megawatt hour (MWh) of generation eligible for compliance against the Massachusetts Renewable Energy Portfolio Standard, including but not limited to pollution offsets or allowances and regulatory compliance rights. All generation suppliers in Massachusetts are required to purchase RECs, or pay an alternative compliance penalty. The RECs from the Project would allow the Compact's competitive supplier to meet these standards at more stable and lower-cost prices than other alternatives. Thus, the sale of RECs associated with the Project would lower the aggregated supply costs of the Compact's members as well as the more than 200,000 individual consumers presently participating in the Compact's opt-out power supply aggregation.

The Project would also respond to several state and local policy initiatives concerning the development of renewable energy resources:

- **The Massachusetts Green Communities Act.** In July 2008, Massachusetts Governor Deval Patrick signed into law the Massachusetts Green Communities Act (the Act). The Act substantially

¹ The Cape Light Compact is an inter-municipal regional energy services organization made up of all 21 towns comprising Barnstable and Dukes counties. The purpose of the Compact is to represent and protect consumer interests in a restructured utility industry. As authorized by each town, the Compact administers the regional energy efficiency program and works with the combined buying power of the region's over 200,000 electric consumers to negotiate for lower cost electricity, including a green power offering, and other public benefits.

changed the state's energy portfolio program by prescribing a series of provisions, including net metering, intended to encourage the development of new renewable energy resources tied to aggressive targets for the state to increase the percentage of its electric load from renewable energy generation from 4 percent in 2009 to 15 percent by 2020, plus an additional one percent per year thereafter.

Currently, Massachusetts has less than 6 MW of its power capacity supplied by wind resources. This community-based Project would significantly increase current capacity generated by wind power in Massachusetts.

- **The Massachusetts Global Warming Solutions Act.** In August 2008, Massachusetts Governor Deval Patrick signed into law the Global Warming Solutions Act, which requires the Commonwealth to reduce its greenhouse gas emissions at least 80 percent below 1990 levels by 2050. The bill calls for the Secretary of Energy and Environmental Affairs to set an interim target of between 10 and 25 percent below 1990 levels by 2020, as well as targets for 2030 and 2040. Previously, the Commonwealth had reduction goals of 1990 levels by 2010 and 10 percent below 1990 levels by 2020, with a long-term goal of reducing emissions to avoid dangerous climate change.

The Project, once operational, would facilitate the reduction targets established by the Global Warming Solutions Act.

- **The Town of Brewster Zoning Bylaw, § 179-40.2 Wind Energy Turbines.** On November 15, 2007, the Town of Brewster adopted the bylaw referenced above, in order to encourage appropriate land use, environmental protection, adequate infrastructure development, and the preservation of historical, cultural, archeological, architectural, and recreational values.
- **Energy Independence.** A stated goal of community wind energy projects is the direct provision of energy, locally and cleanly generated, for the host community. The Proposed Project would supply all of the Town of Brewster's municipal electricity needs through the local generation of approximately 6,000 megawatt hours annually (CVEC, September 2010).
- **Emissions Displacement.** Once operational, the Project, using wind as its fuel source, would not generate air emissions. Generation by the Project of approximately 6,000 megawatt hours annually would displace traditional fossil fuel generation and, as a result, would also displace the emissions generated through the use of fossil fuel. Based on the annual average emission rate data for Massachusetts developed by ISO-NE², operation of the Project would displace 2.4 tons per year of nitrogen oxides (NOx), 6.4 tons per year of sulfur dioxide (SO₂), and 3,300 tons per year of carbon dioxide (CO₂).
- **Usage Offsets.** The Project would provide electricity for all of the Town of Brewster's municipal needs and will save the Town an estimated \$ 3.6 million dollars over fifteen years. (CVEC, September 2010).

² ISO New England: 2008 New England Electric Generator Air Emissions Report (August 2010).

3.2 Site Description

The Project would be located on Freeman's Way Industrial Park, which is Town owned property located off of Commerce Park Road in Brewster, MA, a zoned industrial area more fully described in Appendix 1.³ See Figure 1. The turbines would be located on parcels 1 and 32 of the site. See Figure 2. The Project Site lies completely within the Town of Brewster Wind Energy Overlay District, as depicted in Figure 3. The Project would fully comply with the Town of Brewster's Zoning Bylaws and wind energy conversion turbine special permit regulations; see Appendix 2 (at 2 – Special Permit Application Narrative).

3.3 Turbines

The Project proposes to install two, 1.80 megawatt (MW) turbines of three-bladed, upwind, horizontal axis, rotor mounted atop a monopole tower design, with a maximum height of 410 feet. The turbines are projected to generate 6,000 megawatt hours annually.

The Town of Brewster would be the primary user of the electricity generated by the two turbines. The remainder of the electricity produced would be allocated to CVEC member towns and counties in accordance with the Massachusetts Net Metering Regulations.

3.4 Electrical Transmission

As set forth in the Appendix 1, the connection of a small wind energy project such as this to a distribution line can be done without requiring a substation or other supporting facilities. The Project would employ an underground collection system which would be brought adjacent to the nearest distribution line. At this point, the underground cable would come above ground to a transition pole. From here, the system would be connected to meter(s), switching, and any other equipment required by NSTAR (the interconnecting utility) and then to the distribution line. See Figure 4, Appendix 2 (at 8 – Civil/Architectural Plan Set Sheets E-1 through E-5), and Appendix 6 (at Interconnection Application).

3.5 Site Improvements

The Project would improve a relatively undeveloped, industrial park site through the development of a new renewable energy facility that supports the intent of the Town Bylaws to encourage appropriate land use, environmental protection, and infrastructure development. See Figure 4 and Appendix 2 (at 10 – Massachusetts Historical Commission Project Notification Form).

Clearing and grubbing would be required for road construction, site preparation, and turbine staging areas. Cleared lands, except for access roads, will be revegetated post-construction. Preliminary site assessment indicates the Project would disturb approximately 5 acres of currently forested area. An existing access road would be lengthened and improved to reach the desired locations for the two turbines and would contain a staging area at each turbine location. Turbine A is proposed for a

³ The Brewster Wind Feasibility Study, performed by Black & Veatch Corporation, was funded through a grant awarded to CVEC by the Massachusetts Renewable Energy Trust (now called the Massachusetts Clean Energy Center) Community-Scale Wind Initiative.

wooded area that would have to be cleared, while Turbine B would be located in a currently cleared area.

Stormwater runoff would be contained onsite, in accordance with the requirements of applicable federal, state, and local permits and authorizations.

3.6 Summary of Site Impacts

The overall impacts to the Project Site would be minimal. Two turbines are being erected, which would result in permanent disturbance of less than six acres of land, including the areas required to stage the turbine erection, crane pads, access roads and foundation. Temporary construction impacts would be minimal and limited to within the disturbed area, as further described in Section 6.0 and Appendix 2.

4.0 ALTERNATIVES CONSIDERED

Prior to selection of the proposed Project, CVEC considered maintaining existing conditions (the “No-Action” Alternative), other combinations of wind and solar technologies (Renewable Energy Technologies), and, after determining that wind power provided the greatest level of benefits with minimal impacts to the human and built environment, alternative locations for project siting within the Town of Brewster.

4.1 No Action Alternative

Under the No Action alternative, CVEC would not construct the Project. No source of new, locally generated, renewable energy would be available to provide power for the Town of Brewster to offset its municipal electrical expenses and to showcase renewable energy projects for the surrounding towns located on Cape Cod and the island of Martha’s Vineyard. Moreover, CVEC would not sell the RECs associated with the Project to the Compact for use in meeting the Renewable Energy Portfolio Standard. As a result, the Town and CVEC members would pay higher electricity costs and the aggregated power supply costs of the Compact’s members would not decrease.

The No Action Alternative would also prohibit CVEC from meeting its goals. CVEC was created because of its members’ need to develop renewable energy projects that would help stabilize rates on a long-term basis and reduce energy costs for members and ratepayers within CVEC member communities.

4.2 Renewable Energy Technologies

CVEC is currently pursuing other wind and solar technology-based renewable energy projects on Cape Cod and the Martha’s Vineyard. Central to the CVEC analysis of alternative projects is the Massachusetts Green Communities Act. The net metering provisions of the Act, that are directly applicable to wind and solar technology, are crucial to the economic feasibility of any new renewable energy project. This is the primary reason for CVEC’s focus on wind and solar technology.

4.2.1 Solar (Photovoltaic or PV) Energy Technology

CVEC recently developed a PV project with financial capital from Consolidated Edison Solutions, Inc., and its members have installed several small and mid-sized PV systems on their facilities that are eligible for certain incentives under the Commonwealth Solar Rebate program. The REC Market for PV is in transition in Massachusetts as the state rolls out its Solar Carve-Out program over the course of 2010 and 2011. Thus, CVEC is also considering large-scale PV systems that would be eligible to participate in the solar REC auction process under the Solar Carve-Out program.

4.2.2 Wind Energy Technology

CVEC's decision to pursue wind turbines was supported by analysis prepared by the Massachusetts Office of Geographic and Environmental Information, which ranked Cape Cod, Barnstable County, first among all state counties with a high wind resource. A high wind resource is defined as average annual wind speed greater than or equal to 6 meters per second at a height of 70 meters. In addition, CVEC may choose to use wind turbines over solar installations in some cases (e.g., for the Proposed Project) because the kilowatt hour output and capacity factors for solar energy systems are substantially lower in comparison to land-based wind turbines in this region.

4.3 Alternative Project Locations

The CVEC considered six alternative locations for the Project, as more fully described in Appendix 1. CVEC commissioned the Feasibility Study set forth in Appendix 1 in order to identify and preliminarily rank six potential locations for the Project. The Feasibility Study ranked each of the six potential locations based upon a series of screening criteria, which included:

- Wind resource
- Land use controls
- Special or sensitive habitats
- Noise
- Shadow flicker
- Ease of interconnection
- Cost

A second-level screening considered:

- Parcel ownership, with Town-owned parcels being the preference
- Ability to avoid, minimize, or mitigate impacts of the Project on residential areas

- Accessibility from existing roads
- Conformance with local zoning requirements

The location initially selected was the Barrows location, a moderately wooded area located in proximity to major roads. However, this initially preferred location was rejected because use of this site for a renewable energy wind project would have required a two-thirds voice vote of the Massachusetts Legislature.⁴

Based on the criteria identified here and as further described in Appendix 1, the Commerce Park site, located within Freeman's Way Industrial Park, was selected as the Preferred Site for the Project.

4.4 Preferred Project Site

The Preferred Project Site consists of approximately 99 acres⁵ and lies within a relatively undeveloped, industrially zoned area; approximately 65 acres⁵ of the Site are presently wooded with 30 foot to 50 foot trees. The Town of Brewster By-law has been amended, by vote of the local community, to authorize the siting of up to two, 1.80 MW wind turbines. The locations of the turbine footprints and the Site boundary are depicted in Figure 4.

The nearest residence to the locations proposed for construction of the wind turbines within the Project Site is over 2,200 feet away to the north. Installation of the turbines would require limited portions of the wooded area (approximately 5 acres) to be cleared for the construction of roads, foundations, crane pads and lay-down/assembly areas; see Appendix 2 (at 8 – Civil/Architectural Plan Set at Sheets C-1 through C-5). Wind turbines located at the Site would not impact normal traffic, except for very minimal impacts during construction of the turbines due to construction vehicles entering and leaving the Site.

4.5 Public Scoping

On July 1 2010, RUS notified the public about the intent to solicit comments and prepare an Environmental Assessment with regards to the Project. The notice appeared in the Cap Cod Times and described the Project as, "two wind turbines and associated facilities in the Town of Brewster's Commerce Park area." The notice stated the general location of the Proposed Project, the height of the turbines, the existing zoning for the proposed location and the owner of the parcels affected. A siting study and project description were available for review and public comment at the agency's website and at USDA Rural Utilities Service, Mail Stop 1571, Room 2239, 1400 Independence Avenue, SW, Washington DC 20250 Attn: Lauren McGee

Twenty four comment letters were received and all were in support of the Project. Many followed a similar structure, calling out specific topics of concern that had been addressed in the initial feasibility

⁴ A portion of this location has been designated as an open space area covered by Article 97 of the Article of Amendment to the Constitution of the Commonwealth of Massachusetts. Any proposed change in a designated legal interest or control, or change in use of an Article 97 area requires a two-thirds voice vote of the Great and General Court of the Commonwealth of Massachusetts.

⁵ Weston & Sampson, project engineer

study. Letters recognized the appropriate siting of the Proposed Project, the environmentally friendly nature of wind power, and the fact that it would benefit the local community. Many letters acknowledged that noise, shadow flicker and viewshed issues appeared to be minimal because of the appropriate choice in location for the Project.

5.0 AFFECTED ENVIRONMENT

CVEC has assimilated environmental baseline data from a series of federal and state agencies, the Town of Brewster, and a series of other entities including, but not limited to, the U.S. Department of Fish and Wildlife Service (USFWS), the U.S. Natural Resources Conservation Service, USDA, the U.S. Department of Commerce, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the Federal Aviation Administration (FAA), ISO New England, Massachusetts Geographic Information System (MassGIS), the Massachusetts Department of Environmental Protection (MassDEP), the Massachusetts Natural Heritage and Endangered Species Program (NHESP), the Massachusetts Emergency Management Agency, the Massachusetts Office of Coastal Zone Management (MCZM), the Massachusetts Department of Conservation and Recreation, the Massachusetts Historical Commission (MHC), the Massachusetts Department of Transportation (DOT) Aeronautics Division, the Town of Brewster, the American Wind Energy Association, and the Massachusetts Renewable Energy Trust.

5.1 General Land Use

The Project is proposed to be constructed on Town-owned property, the Freeman's Way Industrial Park. Siting of the Project at this location was approved by the voters of Brewster at an October 2009 Special Town Meeting. The Project Site is located in an industrially zoned area, within the Town's Wind Energy Overlay District located adjacent to Mid-Cape Highway and approximately 450 feet from a local driving range. The Project Site is easily accessible through existing roads and the Project would not require ancillary facilities, such as substations or additional taps. CVEC has control over the necessary setback and clear areas of the Project Site, as further described in Appendix 2.

The Project Site area is approximately 99 acres. A portion of the Site is wooded with 30 to 50 foot trees. Construction of the Project would permanently disturb approximately 5 acres, where the turbines will be constructed, and would require clearing portions of the wooded area for the construction of roads, crane pads, and lay-down/assembly areas. Much of the land surrounding the Project Site is already cleared, making access to the Site much easier for construction and limiting the amount of new clearing that would be needed.

The wind turbines and associated equipment would comply with all applicable building setback provisions. The minimum distance from the base of each turbine to any property line, road (except for roads used exclusively for serving of the turbines), habitable dwelling, business, institution, or public recreational area are equal to the required fall zone. In addition, the fall zone is currently free of, and would be kept free of all habitable structures during the operational life of the Project.

The Project Site does not include any protected areas for wildlife, public water supplies, or designated cultural/historical, or open-space areas, and the nearest residence from the Site property line is over 1,300 feet away to the north (1,800' away from the nearest wind turbine). See Appendix

2 for additional information concerning general land use and compliance with all applicable zoning ordinances and land use plans.

5.2 Prime Farmland

No Important Farmland areas exist at the Project Site; see Figure 5. Two small patches of Freetown and Swansea mucks, 0 to 1% slopes, exist west and northwest of the Project Area, and are considered farmland of unique importance. These two small parcels would not be affected by the Project due to their distance from the Project Site.

5.3 Formally Classified Lands

No Formally Classified Lands exist at the Project Site or within the Project Area; see Table 5.3.1.

Table 5.3-1 Formally Classified Lands

	Brewster
National Parks & Monuments	National Seashore: Commerce Park proposed turbine location is 3 miles W of park boundary.
National Natural Landmarks	Muskeget Island: Golf Course proposed turbine location is 30.7 miles N of park boundary.
National Battlefields	None located in Massachusetts
National Historic Sites & Parks	New Bedford Whaling National Historic Park: Waste Transfer Station proposed turbine location is 43 miles E of park boundary.
Wilderness Areas	Monomoy National Wildlife Refuge: Golf Course proposed turbine location is 6 miles NW of park boundary.
Wild & Scenic and Recreational Rivers	Sudbury, Assabet, and Concord Wild and Scenic Rivers: Transfer Station proposed turbine location is 82 miles SE of park boundary.
Wildlife Refuges	Monomoy National Wildlife Refuge: Golf Course proposed turbine location is 6 miles NW of park boundary.
State Parks	Nickerson State Park: Barrows proposed turbine location is .18 miles S of park boundary.
BLM Lands	None located in Massachusetts (or in any New England state)
National Forests	Green Mountain National Forest, VT: Waste Transfer Station proposed turbine location is 160 miles SE of park boundary.
Native American Owned Lands Administered by BIA	Gay Head (Indian Trust, Wampanoag Tribe): Waste Transfer Station proposed turbine location is 47.1 miles NE of park boundary.

5.4 Floodplains

The Project Site is not within any designated floodplain area; see Figure 6 and Appendix 2.

5.5 Wetlands

Approximately 0.5 acres of federal and state jurisdictional resources are located at the Project Site ; see Figure 7 and Appendix 2.

5.6 Cultural Resources

This section describes the cultural resource studies and consultations conducted to comply with Section 106 of the NHPA and to assist in compliance with NEPA. The studies were conducted to assess potential impacts of the undertaking (the Project) on historic properties identified within the Project's Area of Potential Effect (APE). An APE is generally defined as the area in which impacts of a project could directly or indirectly alter the historic characteristics which qualify a property for listing on the National Register of Historic Places (National Register).

Studies

The studies were designed in consultation with RUS and to address comments by the Massachusetts Historic Commission (MHC) in its letter dated August 23, 2010, responding to notifications about the Project (see regulatory correspondence in Appendix 6). The following studies were completed and are included in the *Cultural Resources Assessment Report* in Appendix 8:

- Archaeological Assessment Survey
- Historic Architectural Reconnaissance Survey
- Visibility Survey

Cultural resources within two APEs were identified. The archaeological APE for direct physical effects, such as disturbance or destruction during construction, consists of the construction footprints of the two turbines. The APE for indirect visual effects consists of historic architectural properties within 1.5 miles of the turbines, as established by RUS (see Appendix 8). Visual effects to a historic architectural property can occur when: (1) the introduction of structure(s) alter views of the setting of the property, and (2) if the setting is determined to contribute to the characteristics that qualify the property for the National Register.

As detailed in Appendix 8, the studies identified no previously recorded archaeological resources and no historic architectural structures within the archaeological APE. The archaeological APE associated with the northernmost Turbine A was assigned a high archaeological sensitivity for potential archaeological deposits, due to its proximity to a nearby freshwater pond. An intensive archaeological survey was completed in December of 2010, concluding that no archaeological sites were discovered and no further archaeological testing was recommended.

The archaeological APE of southernmost Turbine B was assigned a low archaeological sensitivity, due to extensive prior ground disturbance and grading associated with the adjacent golf driving range.

No historic architectural properties previously listed or determined eligible for inclusion on the National Register were found within the 1.5-mile radial visual APE. Two historic architectural structures considered by an architectural historian to be potentially eligible for listing on the National Register were identified. Computerized viewshed analysis of the extent of visibility of the turbines (based upon topography, vegetative screening and the maximum planned height of the turbines) and a confirmatory field visibility assessment indicate views of the two historic architectural properties from publicly accessible ground level locations would not include the proposed turbines. The architectural historian concluded that the settings of the historic properties would not be altered; see Appendix 8.

Consultations

By letter dated June 17, 2010, the RUS initiated government-to-government consultation with three federally recognized Indian Tribal Nations in southeastern Massachusetts about the Project and inviting them to participate in consultations about the Project. The following individuals were notified (see letters in Appendix 8):

- John Brown, Tribal Historic Preservation Officer, Narragansett Indian Tribe of Rhode Island
- Matthew Thomas, Chief Sachem, Narragansett Indian Tribe of Rhode Island
- Cheryl Andrews-Maltais, Chairperson, Wampanoag Tribe of Gay Head (Aquinnah)
- Bettina Washington, Tribal Historic Preservation Officer, Wampanoag Tribe of Gay Head (Aquinnah)
- Cedric Cromwell, Chairman, Mashpee Wampanoag Tribe
- George Chuckie Green, Assistant Director of Natural Resources, Mashpee Wampanoag Tribe

To date, RUS has not received formal responses to any of the letters from the Tribal Nations. Via phone, the Mashpee Wampanoag Tribe showed no interest in the Project.

On July 1, 2010, a Notice of Intent (NOI) to Solicit Comments and Prepare an Environmental Assessment, was published in the Cape Cod Times. The notice also solicited public comments on effects that the Project could have on historic properties, in accordance with Section 106 of the NHPA. The publication of the NOI commenced a thirty day public comment period, which closed on July 31, 2010. All of the written comments submitted in response to the NOI supported the Project; see Appendix 7. None of the comments expressed concern about the Project's potential effects to historic properties.

On August 3, 2010, ESS (on behalf of CVEC) submitted a Project Notification and a request for information concerning the Project to the MHC. On August 12, 2010, CVEC submitted a Project Notification Form and conceptual site plan to the MHC. The MHC response, dated August 23, 2010,

did not identify any cultural sites at the Project Site and concurred with the RUS's proposed APE for visual effects of a radius of 1.5 miles from the wind turbines. These correspondences are included in Appendices 2, 6, and 8.

5.7 Threatened and Endangered Species

The NHESP area designations reviewed and mapped for the Project Site include:

- **Areas of Critical Environmental Concern (ACEC):** These are areas in Massachusetts that are considered special and highly significant due to their natural and cultural resources. Nominations for areas to receive ACEC designation are made by communities to the state Secretary of Environmental Affairs. Administration of the ACEC program is done by the Department of Conservation and Recreation.
- **Priority Habitat for Rare Species:** These areas are NHESP estimates of habitats for rare species. The boundaries of these habitats are considered approximate.
- **Protected and Recreational Open Space:** These are areas that have been designated at the state or community level as areas for limited or no development. The Massachusetts Geographic Information System (MassGIS), the service from where the data was obtained, indicated the accuracy of the identified open space locations was limited.
- **BioMap Core Habitats:** The BioMap program was completed in 2001 by NHESP, and identified areas considered to represent "habitats for the state's most viable rare plant and animal populations". BioMap Core Habitats and Living Water Core Habitats encompass almost 1.4 million acres, or about 28 percent of the land area of Massachusetts.
- **Certified Vernal Pools:** NHESP define vernal pools as "small, shallow ponds characterized by lack of fish and by periods of dryness." These pools are deemed critical to some wildlife, and are protected under a variety of state programs including the Massachusetts Wetlands Protection Act.
- **Living Waters Critical Supporting Watersheds:** These watersheds are identified as being critical for supporting Living Waters Core Habitats. They were identified in the Living Waters project completed in 2003 by NHESP.
- **Living Waters Core Habitats:** Similar to the BioMap Core Habitats, the Living Waters Core Habitats are those rivers, streams, lakes, and ponds critical to the biological diversity of Massachusetts.

None of these core habitats are found within the Project Area; see Figure 8 and Figure 9.

5.8 Avian and Bat Assessment

ESS, on behalf of CVEC, performed a Phase I Avian and Bat Risk Assessment concerning the effect of the Proposed Project's two wind turbines located at the Preferred Project Site. The July 2010 Avian Risk Assessment Report (Report) describes the Avian Habitat Analysis Methodology, Habitats, and Important Bird Areas; analyzes Breeding Seasons, Migrations; and Risk to Rare Species; and provides

conclusions concerning potential Bird Impacts resulting from the Project. The Report also addresses potential collision risks to resident bats. The Report is included here at Appendix 3.

5.8.1 Bird Impact

Based on a review of readily available literature, the Project Site does not appear to be an important nesting or foraging area for federally or state endangered, threatened, or species of special concern. However Brewster Ponds and Woodlands and Brewster-Eastham Flats Important Bird Areas are located within five miles of the Project Site. Migrating birds, especially shorebirds and waterfowl, are known to be attracted to these types of areas.

The USFWS and the NHESP (a division within the Massachusetts Department of Fish and Game), were contacted in April 2010 for confirmation regarding the lack of presence of endangered or threatened species, or species of concern at the Project Site; see Appendix 6.

The USFWS indicated that federally threatened Piping Plovers are known to breed on coastal beaches to the north, south, and east, but are not known to occur near the Project Site. Roseate Terns are not known to nest near the Site, but could occur over the mainland of the Cape during the post-breeding period when the birds begin to congregate to feed in preparation for their southward migration.

The NHESP did not identify any state-listed rare bird species occurring on the Project Site. The written requests and the responses from the USFWS and NHESP are included here in Appendix 6.

There have been numerous other studies and reviews of avian impacts from wind turbine generators of varying sizes in the United States, Canada, and Europe. The results from these studies vary in the details but are consistent in supporting the observation that avian mortality rates at wind power sites, especially at modern facilities, are generally low.

The two turbines at the Project Site are proposed to have slower-rotating blades and tubular towers. The larger diameter of the rotor results in a reduction in the number of rotations the blades make per unit of time. This is likely to allow the blades to be more readily seen by birds and thus avoided.

5.8.2 Bat Impact

The Report also looked at the collision risk to resident bats (i.e., little brown myotis, eastern pipistrelle, northern myotis, and big brown bat) on the Project Site and found it is expected to be minimal and similar to the risk from collision with other vertical structures including communication towers. The potential impacts to migrating bats (i.e., hoary bat, silver-eared bat, and red bat) are largely unknown due to the lack of information on migration routes of these species.

5.8.3 Other Listed Species

The BioMap report lists the following in the Brewster area:

- Endangered Plants: Maryland Meadow Beauty, Purple Milkweed
- Endangered Invertebrates: Midland Clubtail Dragonfly
- Threatened Invertebrates: Pine Barrens Bluet, Water-Willow Stern Borer, Scarlet Bluet
- Threatened Vertebrates: Diamondback Terrapin

Appendix 3 discusses these listings in greater detail.

5.9 Coastal Areas

The federally approved MCZM Plan (Chapter 3) describes the geographic extent of the Massachusetts Coastal Zone as the lands and waters within an area defined by the seaward limit of the state's territorial sea (generally 3 miles from shore) extending from the Massachusetts/New Hampshire border south to the Massachusetts/Rhode Island border, and landward to 100 feet inland of specified major roads, rail lines, or other visible rights-of-way. The coastal zone includes all of Cape Cod, Martha's Vineyard, and Nantucket; see Figure 10. The MCZM Plan's enforceable policies apply to any federal activity that may reasonably be expected to affect the land or water resources or uses of the Massachusetts coastal zone. The Town of Brewster (within which the Project is proposed to be sited) lies within the Massachusetts Coastal Zone.

The Project Site, based upon review of the USFWS mapped Coastal Barrier Resources System Units, as depicted in Figure 11, does not fall within any area subject to the jurisdiction of the Coastal Beaches Resources Act or the Coastal Barrier Improvement Act.

5.10 Air Quality

Air quality impacts would be limited to the construction phase, as the wind turbines, once in operation, would not produce emissions and no air permit (e.g., Construction Plan Approval) is anticipated to be required by MassDEP.

5.11 Water Quality

Based on a review of data available through MassGIS and observations during a visit to the Project Site, the Project is not located in proximity to any Outstanding Resource Waters. These include ACECs, the Cape Cod National Seashore, Protected Shorelines, Public Water Supply Watersheds, Retired Public Water Supplies, Scenic/Protected Rivers and Wildlife Refuges; see Appendix 2.

5.12 Aesthetics

The Project Site is not located near any residences, and shadow flicker and visual impacts are not anticipated. As described in greater detail in Appendix 2 at 2 – Special Permit Application Narrative, the locations for the siting of the turbines comply with the requirements of the Town of Brewster Bylaw Sections 179-40.2 (Wind Energy Turbine – Use, Site, and Dimensional Regulations) and 179-51 (Special Permits – Consistency with Purpose and Intent of the Town of Brewster's Comprehensive Plan, sub-sections [1] and [2] addressing aesthetic and visual impacts). Mature forested vegetation

and street trees throughout the area provide visual screening that would tend to limit long range views of the Project from many areas, although intermittent views would be available from some locations.

As described in Section 5.6 and Appendix 8, based upon results of a Visibility Assessment, including a computer viewshed analysis and confirmatory field survey reconnaissance, an architectural historian has found that the Project would have No Effect on public views of the two historic architectural properties identified within the 1.5-mile radial visual APE established by the RUS.

5.13 Transportation

The closest airports to the Project Site are the Chatham Municipal Airport to the north, and the Barnstable Municipal Airport to the southwest. The Chatham Municipal Airport is approximately 3.7 miles from the closest wind turbine location at the Project Site.

Based on an evaluation conducted by the FAA and the DOT, the Project presents No Hazard to air navigation; see Appendix 6.

5.14 Noise

ESS completed a *Sound Survey and Analysis Report – Proposed Wind Energy Facility in the Town of Brewster, Massachusetts, Cape & Vineyard Electric Cooperative, Inc. (July 2010)*. The Report is included here at Appendix 4.

Appendix 4 provides background information on concepts related to environmental sound and includes descriptions of the noise metrics applied, applicable noise standards and regulation, the results of the ambient sound measurement program, predicted noise levels from full load operation of the Project, and an assessment of the potential noise impacts of the Project.

5.14.1 Applicable Performance Standards

Noise standards applicable to the Project are prescribed by the Code of the Town of Brewster, Massachusetts, v30 Updated 06/01/2010/Part II General Legislation/Chapter 179, Zoning/Article IX, Special Regulations/ § 179-40.2 Wind Energy Turbines.

Section 179-40.2E(6) provides that the noise level at the lot line may not exceed 10 dBA over the ambient sound level and must comply with the existing Town of Brewster Noise Bylaw, codified at the Code of the Town of Brewster, Massachusetts, v30 Updated 06/01/2010/Part II General Legislation/Chapter 125, Noise. The performance standards prescribed by the Town of Brewster regulations are consistent with the MassDEP noise regulation codified at 310 CMR 7.10.

5.14.2 Measurement Locations

Long-term, unattended noise measurements were performed at the southeast corner of the Project Site. The results of long-term sound measurements at this location were used to understand the effects of area-wide wind speeds on ambient sound levels.

Additional, short-term, attended ambient sound measurements were performed at five community locations determined to be representative of the closest noise-sensitive land uses, as follows:

- Location 1: At the baseball field on Freemans Way, located approximately 2,760 feet from the closest turbine, representing the closest noise-sensitive land use to the west of the Project.
- Location 2: At the west end of Huckleberry Lane, located approximately 2,460 feet from the closest turbine, representing the closest residential land use to the southeast of the Project.
- Location 3: At the west end of Nan-Ke-Rafe Path and north of Route 6, located approximately 1,800 feet away from the closest turbine, representing the closest residential land use to the north of the Project. [see earlier note on page 8 regarding distance of closest residence to the north]
- Location 4: At the west end of Timber Lane Drive, located approximately 3,570 feet from the closest turbine, representing the closest residential land use to the east of the Project.
- Location 5: At the north end of Old Mansion Road, located approximately 2,250 feet from the closest turbine, at the location of an assisted living facility.

5.14.3 Noise Prediction Model

The Cadna-A[®] computer noise model was used to calculate sound pressure levels from the operation of Project components at noise-sensitive locations in the vicinity of the proposed Project. This model takes into account:

- Sound power levels from stationary and mobile sources
- The effects of terrain features including relative elevations of noise sources
- The locations of noise-sensitive land use
- Intervening objects including buildings and sound barrier walls
- Ground effects due to areas of pavement and unpaved ground

Acoustic emissions data provided by the turbine manufacturer, Vestas for the V90 1.8/2.0 MW turbine was used in the modeling analysis.

5.14.4 Conclusions

Predicted noise levels from full operation of the proposed wind energy facility were evaluated with respect to applicable state and local noise regulations for both high wind speed conditions and low wind speed conditions. Operational noise was assessed at the property line of the Preferred Project Site and at the closest noise-sensitive land use in the surrounding community.

The results of this noise assessment, demonstrate compliance with the applicable noise regulations.

Noise levels generated through operation of the Project would meet the applicable performance standards, as set forth at Appendix 4.

5.15 Human Health and Safety

The Project would comply with all relevant federal, state, and local requirements, including all requirements prescribed through the Town of Brewster Planning Board and Zoning Ordinances concerning human health and safety, including but not limited to requirements addressing noise, shadow flicker, land use, setbacks, fall zones, ice throw, site access, and traffic; see Appendix 2.

There are no habitable structures at the Project Site and CVEC has control over the Site such that no habitable structures would be constructed at the Project Site over the operational life of the Project; see Appendix 2.

In accordance with the Town of Brewster's Comprehensive Plan, the Project would minimize any potential human health or safety impacts through prohibiting site access except for the purposes of constructing the Project, and for providing access for emergency equipment, and for police and fire protection; see Appendix 2.

The streets serving the Proposed Project are adequate (width, grade, construction, overall safety and design capacity) to carry all prospective traffic and Site access roads would be blocked from public access; see Appendix 2.

5.16 Socio-Economic and Community Resources

The Project would, as described in Section 3.1, provide significant energy, economic, and air quality benefits to CVEC member communities and consumers within the service area of the Cape Light Compact, Cape Cod, and Martha's Vineyard. The Project would not impose additional burdens on community resources (e.g., police, fire, emergency services).

5.17 Environmental Justice

In accordance with Executive Order 12989 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations) (February 11, 1994), and USDA Departmental Regulation 5600-2 (Environmental Justice - December 15, 1997), CVEC conducted outreach to its member communities, as well as to the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), in order to identify if the Project would have, or would be perceived to have, a disproportionate effect on minority and low-income populations.

CVEC first analyzed the EEA Environmental Justice Policy(Policy), which provides that the Policy applies to Massachusetts Environmental Justice (EJ) communities, designated based on the 2000 U.S. Census. EJ populations are designated within Massachusetts cities and towns based on the following criteria:

- Households earn 65% or less of the statewide household median income; or
- 25% or more of the residents are minority; or
- 25% or more of the residents are foreign-born; or
- 25% or more of the residents are lacking English language proficiency

A city or town that meets one or more of the above-criteria is considered to have an EJ population. A city or town that meets all four criteria is considered to be an EJ community. Massachusetts lists 108 of the Commonwealth's 351 cities and towns as having an EJ population and 20 cities and towns are considered to be EJ communities subject to the EEA Environmental Justice Policy. The Town of Brewster does not meet any of the criteria for an EJ population or an EJ community and is not included on the EEA List of EJ Communities. See Appendix 5.

6.0 ENVIRONMENTAL CONSEQUENCES

6.1 General Land Use

The Project would permanently disturb approximately 5.8 acres for installation of the turbine foundations. The Project, as described in Section 5.1, would have no significant impacts on protected areas for wildlife, public water supplies, designated cultural/historical, or open space areas, or residences.

6.2 Prime Farmland

There is no Important Farmland within the Project Site, as further described in Section 5.2 and as depicted in Figure 5.

6.3 Formally Classified Lands

No Formally Classified Lands exist within the Preferred Project Site, as further described in Section 5.3.

6.4 Floodplains

The Project does not lie within a FEMA-designated floodplain and is not included within the Town of Brewster Floodplain Overlay, as further described in Section 5.4 and as depicted in Figure 6.

6.5 Wetlands

The Project, as further described in Sections 5.5 and 5.8.2, and as depicted in Figure 7, would not affect any federal, state, or local jurisdictional resource areas.

6.6 Cultural Resources

The Project would have No Effect on historic architectural properties (see Section 5.6 and Appendix 8). No archaeological deposits are known within the archaeological APE (the construction footprints) of the turbines. .

The Project would have no significant impact or effect on scenic views; see Appendix 2 (at 2 – Special Permit Application Narrative, 10 – Massachusetts Historical Commission Project Notification Form, and 13 – Photo Simulations of Proposed Wind Energy Project).

6.7 Threatened and Endangered Species

There are no federally listed or state-listed threatened, endangered, or avian or bat species of special concern at the Project Site and, as more fully described in Section 5.7 and Appendix 3, and as depicted in Figure 8, would have no impacts upon threatened and endangered species, or species of special concern.

6.8 Avian and Bat Impacts

Impacts to avian species and to bats from the Project, As more fully described in Section 5.8 and Appendix 3, impacts to avian species and to bats are expected to be minimal. USFWS and NHESP did not identify any federal or state-listed endangered or threatened species, or species of special concern at the project Site.

6.9 Coastal Areas

Section 5.9 discusses the geographic scope and extent of the Massachusetts Coastal Zone, as designated by the approved MCZM Plan and as depicted in Figure 10. The Town of Brewster lies within the Massachusetts Coastal Zone.

The Project falls within the Massachusetts coastal zone, but would not have any significant effect upon the land or water resources or uses of the coastal zone. It is anticipated that the Project will be determined to be fully consistent with the enforceable policies of the approved MCZM Plan.

The Project, based upon review of the USFWS mapped Coastal Barrier Resources System Units, as depicted in Figure 11, does not fall within any area subject to the jurisdiction of the Coastal Beaches Resources Act or the Coastal Barrier Improvement Act.

6.10 Air Quality

As described in Section 3.1, the Project would have beneficial effects upon air quality, including the displacement of 2.4 tons per year of NO_x (an ozone precursor), 6.4 tons per year of SO₂, and 3,300 tons per year of CO₂ (a greenhouse gas) The Project would significantly decrease the carbon footprint of the Town and would showcase new renewable energy projects.

Minimal temporary, short-term impacts may occur during the construction phase of the Project.

6.11 Water Quality

The Project, as further described in Section 5.11 and Appendix 3, is not expected to have any impacts to water quality. During access road, staging area and Project construction, Best Management Practices (including, for example, SPCC plans and stormwater permit requirements) would be followed to ensure the Project would not result in the degradation of surface or groundwater quality. The turbines would be located outside of any 100 foot wetland buffer zone, and

appropriate construction methods would be implemented, including the use of hay bales and silt fences to protect the surrounding areas during construction. In the case of a spill or accident involving construction equipment, the proper clean up plans and procedures would be followed.

6.12 Aesthetics

The Project Site is not located near any residences, and shadow flicker from the Project would not affect any residences, as further described in Section 5.12 and Appendix 2.

Mature forested vegetation and street trees throughout the area provide visual screening that would tend to limit long range views of the Project from many areas, although intermittent views would be available from some locations. Views of the two existing communications towers in Commerce Park are intermittent throughout the area, due to this vegetative screening. Based upon results of a visibility assessment, an architectural historian has found that the Project would have No Effect on public views of the two historic architectural properties identified within the 1.5-mile radial visual APE established by the RUS (see Appendix 8)

The Project would have no significant impact or effect on scenic views; see Appendix 2 (at 2 – Special Permit Application Narrative, 10 – Massachusetts Historical Commission Project Notification Form, and 13 – Photo Simulations of Proposed Wind Energy Project).

The Project would comply with all applicable local requirements concerning setbacks, and would take all practicable measures to maintain wooded areas at the Project Site to provide visual screening for the wind turbines.

6.13 Transportation

The Project, as further described in Section 5.13, Appendix 2 and Appendix 6, presents No Hazard to Air Navigation.

With regard to traffic and road access, as further described in Section 5.15 and Appendix 2, the Project would not generate excessive traffic. The streets serving the Project are adequate (width, grade, construction, overall safety and design capacity) to carry all prospective traffic and Site access roads would be blocked from public access.

6.14 Noise

The Project, as further described in Section 5.14 and Appendix 4, would meet all applicable noise performance standards and is not expected to have any impact on residences within the vicinity of the Project.

6.15 Human Health and Safety

The Project, as further described in Section 5.15 and Appendix 2, would comply with all relevant federal, state, and local requirements, including all requirements prescribed through the Town of Brewster Planning Board and Zoning Ordinances. The Project would not present any significant impacts to human health and safety. As described in Section 5.14, the Project would meet all

applicable performance standards concerning noise, and would not generate significant shadow flicker; see Figure 12 and Appendix 4.

6.16 Socio-Economic and Community Resources

The Project, as described in Section 3.1, would provide significant energy, economic, and air quality benefits to CVEC member communities and consumers within the service area of the Cape Light Compact, Cape Cod, and Martha's Vineyard. The Project would not impose additional burdens on community resources (e.g., police, fire, emergency services).

6.17 Environmental Justice

As set forth in Section 5.17 and Appendix 5, the Town of Brewster does not host any Environmental Justice Communities.

7.0 MITIGATION AND MONITORING

The Project is not anticipated to have any significant impacts on:

- Important Farmland (Section 5.2)
- Formally Classified Lands (Section 5.3)
- Floodplains (Section 5.4)
- Wetlands, (Section 5.5)
- Cultural Resources: Archaeological Resources and Historic Architectural Properties (Section 5.6)
- Threatened and Endangered Species (5.7)
- Coastal Areas (Section 5.9)
- Water Quality (Section 5.11)
- Transportation (Section 5.13)
- Human Health and Safety (Section 5.15)
- Environmental Justice (Section 5.17)

The Project is anticipated to have positive impacts on:

- General Land Use (Section 5.1) by developing a new renewable energy project on existing, relatively undeveloped industrial property.
- Air Quality (Section 5.10) through the displacement of 2.4 tons per year of nitrogen oxides (NO_x), 6.4 tons per year of sulfur dioxides (SO₂), and 3,300 tons per year of carbon dioxide (CO₂).

- Socio-Economic and Community Resources (Section 5.16) by stabilizing electricity rates, lowering municipal costs through net metering, and showcasing a new renewable energy facility.

The Project has the potential for minor, insignificant impacts on:

- Aesthetics (Section 5.12) as potentially affecting viewshed within the APE. Two communication towers already exist within the 1.5-mile visual APE. Mature forested vegetation and street trees limit views of the existing towers to glimpses through the trees. The vegetation would also limit views of the turbines, which, although higher than the existing towers, would be only intermittently visible throughout the area. The Project would comply with all applicable requirements concerning setbacks, and would take all practicable measures to maintain wooded areas at the Project Site to afford visual screening for the wind turbines.
- Avian and Bat Resources (Section 5.8) as the result of potential collisions with the wind turbines. The Project would comply with all applicable requirements concerning monitoring and precautionary lighting. By employing turbines with slower-rotating blades and tubular towers, the Project would further reduce the potential for impacts.
- Noise, Shadow Flicker (Section 5.14). The Project would comply with all applicable requirements concerning setbacks, sound buffering, and land use controls in order to ensure that no habitable structures would be constructed at the Project Site. The Project would also comply with all applicable performance standards concerning noise, as set forth in the MassDEP noise regulation codified at 310 CMR 7.10.

8.0 CORRESPONDENCE AND OTHER PROJECT COORDINATION

See Appendix 6, which compiles all relevant Project correspondence and information concerning Project coordination.

9.0 PUBLIC NOTICES

See Appendix 7, which compiles all relevant public notices, requests for comments, and public comments received.