

STATE OF NEW HAMPSHIRE
BEFORE THE SITE EVALUATION COMMITTEE
Docket No. SEC 2015-02

APPLICATION OF ANTRIM WIND ENERGY, LLC
FOR A CERTIFICATE OF SITE AND FACILITY

PREFILED DIRECT TESTIMONY OF JACK KENWORTHY
ON BEHALF OF
ANTRIM WIND ENERGY, LLC

March 3, 2016

1 **Qualifications of Jack Kenworthy**

2 **Q. Please state your name, title and business address.**

3 A. My name is John (Jack) B. Kenworthy and I am employed as the Head of
4 Development for Walden Green Energy LLC (“Walden”). Prior to taking the position of Head
5 of Development at Walden, I was a founder and Chief Executive Officer at Eolian Renewable
6 Energy, LLC (“Eolian”) for nearly 7 years. Eolian was the original developer of the Antrim
7 Project and entered into a partnership with Walden in February 2015 and the company was
8 recently acquired by Walden. I am also an Executive Officer at Antrim Wind Energy LLC. My
9 business address is 155 Fleet Street, Portsmouth, New Hampshire 03801.

10 **Q. Please describe your responsibilities as Head of Development at Walden.**

11 A. As Head of Project Development at Walden I am responsible for leading and
12 managing all aspects of development for wind projects located in the US currently in the
13 Company’s pipeline, including environmental studies, permitting, interconnection, and technical
14 relationships with turbine manufacturers, contractors and third party consultants. My role also
15 includes identifying and analyzing potential wind energy investment opportunities and leading
16 potential investment projects through the research, analysis, modeling, and recommendation
17 phases. I am also responsible for leading or managing the development and evaluation of
18 potential wind energy business opportunities. This may include working with the Company’s
19 third party joint development partners throughout the development process of those projects.. I
20 have been closely involved in the development of the Antrim Wind Project (the “Project”) since
21 its inception in 2009. I provided extensive witness testimony regarding the previously proposed

1 Antrim Wind Project in Docket 2012-01, and directed the preparation of the current Application
2 for a Certificate of Site and Facility (the “Application”) for the Project. I also negotiated all land
3 leases, agreements with the Town of Antrim and conservation easements in connection with the
4 Project, and have participated in dozens of meetings in Antrim related to the Project.

5 **Q. Briefly summarize your educational background and work experience.**

6 A. I graduated from the University of Vermont in 2000 with a Bachelor of Arts in
7 Environmental Science. I have been an executive in the renewable energy industry for more than
8 a decade, and have extensive project development experience in wind, solar, and biofuel
9 technologies. For further information regarding my professional and educational experience
10 please see my Curriculum Vitae, attached hereto as Attachment JBK-1.

11 **Q. Have you previously testified before this Committee and/or any other state**
12 **permitting agencies?**

13 A. Yes. I provided both written and oral testimony in Dockets No. 2011-02 in
14 support of AWE’s petition to the Site Evaluation Committee to take jurisdiction over its initial
15 Application for a Certificate of Site and Facility, as well as in Docket No. 2012-01 supporting
16 AWE’s application. I have not provided testimony in any other state permit proceedings. In
17 addition, I submitted testimony on March 30, 2015 in the jurisdictional docket (Docket No.
18 2014-05) in support of Antrim Wind, LLC’s petition to the Site Evaluation Committee to take
19 jurisdiction.

20 **Q. What is the purpose of your testimony?**

1 A. The purpose of my testimony is to provide the Site Evaluation Committee (“SEC”
2 or “the Committee”) with background information about the Applicant, Antrim Wind Energy,
3 LLC (“Antrim Wind” or “AWE”) and the Project, and with information on the following topics
4 that are contained in Antrim Wind Energy, LLC’s Application for the Project: details on
5 alternatives to the Project that were considered; the Project’s consistency with the orderly
6 development of the region; our interactions with municipal and regional planning commissions
7 and local governments; and the Project’s consistency with local and State conservation initiatives
8 and other public interests. In addition, my testimony explains how the facility proposed in
9 AWE’s Application differs from the facility reviewed by the SEC in Docket 2012-01, both in its
10 physical attributes and its impacts. The facility that AWE now intends to propose for
11 construction in Antrim differs substantially in several critical and fundamental ways from that
12 which preceded it, and I discuss those differences below. Further, my testimony is intended to
13 support and sponsor information contained in the Application that is not specifically addressed or
14 supported by other witnesses.

15 **Applicant Information**

16 **Q. Please provide information about the Applicant and the companies with**
17 **which it is affiliated.**

18 A. The Applicant, AWE, is a Delaware limited liability company formed in 2009 as
19 a special purpose entity to develop, build, own and operate the Antrim Wind Energy Project (the
20 “Project” or “Facility”). All of the membership interests in AWE are owned by Walden Green
21 Energy, LLC (“Walden”), through its two wholly owned subsidiaries Walden Green Energy

1 Northeast Wind LLC (“Walden NE”) and Walden Antrim LLC (“Walden Antrim”). Walden,
2 Walden NE Wind and Walden Antrim are all registered Delaware limited liability companies.
3 AWE operates from the New Hampshire offices of Walden, located at 155 Fleet Street,
4 Portsmouth, NH 03801. Walden, as the parent of AWE is ultimately responsible for the
5 development, financing, construction and operation of the Project.

6 Walden is a privately held global developer, owner and operator of renewable energy
7 projects. Walden has developed, financed, constructed and either currently operates, or sold
8 upon completion, over 10 MW of renewable generation assets in Massachusetts and Vermont. In
9 addition, Walden is currently developing over 200 MW of wind, solar and hydro generation
10 assets, including Antrim Wind, in the United States, Latin America and Central Eastern Europe.
11 Walden’s background and experience is more specifically described in Section I.5 of the
12 Application and in Henry Weitzner’s prefiled testimony.

13 **Site Information**

14 **Q. Please describe the location and basic characteristics of proposed Project**
15 **site.**

16 A. The entirety of the Project is located in the sparsely settled rural conservation
17 zoning district in the northwest portion of the Town of Antrim. Specifically, the Project is
18 proposed to be located on and adjacent to 354 Keene Road (NH Route 9) and includes
19 approximately 1,870 acres of private lands currently leased by AWE from six landowners. The
20 Project will be constructed primarily on the ridgeline that starts approximately 0.75 miles south
21 of NH Route 9 and runs south-southwest, for approximately 2 miles. The area of initial clearing

1 required for construction of the Project will be approximately 55.3 acres and the area that will
2 directly accommodate any Project facilities (e.g. roads, turbine pads, substations and other
3 facilities) will be approximately 11.25 acres. This represents only 3% of the total amount of the
4 land leased by AWE.

5 Between the ridgeline (where the proposed turbine string will be located) and Route 9, to
6 the north, is a Public Service of New Hampshire (“PSNH”) transmission corridor containing both
7 a 115 kV electric transmission line and a 34.5 kV electric distribution circuit. AWE proposes to
8 interconnect the Project to the grid by building a substation to interconnect to the 115 kV line
9 known as L163. Development adjacent to the proposed Project site consists primarily of rural
10 residential dwellings (and their associated outbuildings) and seasonal camps. The nearest year-
11 round residence is located approximately ½ mile due north of the northernmost proposed turbine
12 (Turbine #1) on Tuttle Hill. The owner of this residence is among the parties that have entered
13 into lease agreements with AWE. The closest structure owned by a party who does not have a
14 lease agreement with AWE is a seasonal hunting camp located approximately one-half mile to
15 the northeast of the northernmost proposed turbine on Tuttle Hill.

16 In general, the Project site is undeveloped and forested. Historically, the area of the
17 proposed Project was cleared for sheep farming; numerous stone walls still remain as a result of
18 this historic activity. After the decline of sheep farming, the site was allowed to regenerate into a
19 forested condition. Subsequently, timber harvesting occurred in many areas on Tuttle Hill and
20 Willard Mountain. Currently, the land in and around the area of proposed development consists
21 of undeveloped forest land in various stages of maturity. Because of this historical logging

1 activity, all of which was unrelated to the Project, the area includes patches of successional
2 forest. A natural community survey indicated that no significant natural communities exist
3 within the Project area, and field surveys for rare plants revealed no rare plants or species of
4 concern. More information about the location and characteristics of the Project site and
5 surrounding area is contained in Sections D.1 through D.6 of the Application.

6 **Facility Information**

7 **Q. Please provide information about the basic design and configuration of the**
8 **proposed wind energy facility.**

9 A. The Project will consist of 9 turbines. Antrim Wind is seeking certification of the
10 Siemens SWT-3.2-113 direct drive turbine. This turbine is a horizontal axis machine configured
11 much like any other typical wind turbine in that its major components include a tower, a nacelle,
12 and a rotor with three blades. The towers for turbines 1-8 will each be 92.5 meters tall and the
13 tower for turbine 9 will be 79.5 meters tall. The Project will also include a permanent
14 meteorological ("MET") tower. The MET tower will be a 100-meter tall, free-standing, lattice
15 steel tower located on the ridge.

16 The proposed Project will consist of approximately 11.25 acres of new facilities,
17 including turbine pads, gravel roadways, electrical substations and support buildings, located
18 within approximately 1,870 acres of private lands consisting of six parcels that are leased by
19 AWE from private landowners. The initial clearing limits to accommodate the construction of
20 the Project will be approximately 55.3 acres.

1 The Project will also require the construction of a joint collector system and
2 interconnection substation as well as an operation and maintenance building (“O&M building”).
3 The electrical collection system will consist of electrical cables for collecting power generated
4 by the facility as well as fiber optic cables for two-way communications between the turbines
5 and the on and off site control centers. The maintenance building is expected to be
6 approximately 3,000 square feet in size. The collector system and fiber cables will be buried
7 along the roadside along the ridgeline and will transition to pole mounted above ground
8 installations where the access road meets the ridge line. The collector and interconnection
9 substations will be located immediately to the north of the PSNH L163 line that passes through
10 property leased by Antrim Wind. The final design of the interconnection substation will be
11 performed by PSNH but will be located within the footprint shown on civil design plans
12 (provided in Appendix 7A of this Application).

13 **Q. How does the reconfigured Antrim Wind Project differ from the project**
14 **reviewed by the SEC in Docket 2012-01?**

15 A. As a general matter, the jurisdictional docket (Docket 2014-05) contains
16 substantial information about the ways in which the projects differ. These changes, both
17 physical and otherwise, are also detailed in Appendix 10 of this application.

18 AWE has made targeted physical changes to the Project design to reduce aesthetic
19 impacts as well as securing additional permanent conservation lands to further mitigate aesthetic
20 impacts. AWE has also conducted a far more comprehensive visual analysis to characterize the
21 Project in the landscape to assist the Committee in its review of this important component.

1 Numerous changes were made to the Project design from 2012 until the present. The
2 Project design was modified from 10 turbines each with a nameplate generating capacity of 3
3 MW, to 9 turbines with a capacity of 3.2 MW. By removing turbine #10, AWE has substantially
4 reduced the physical scale of the proposed facility and, in doing so, eliminated all of the civil and
5 electrical infrastructure associated with turbine #10. Turbine #10 was identified in Docket 2012-
6 01 as having a particularly strong impact upon Willard Pond, and AWE has removed it to
7 directly address that concern.

8 Additionally, the turbine heights from foundation to blade tip were reduced from the
9 previous project design. In 2012, all 10 turbine heights included in the application were
10 approximately 492 feet. In the reconfigured Project design, AWE has significantly reduced the
11 height of turbine # 9 to eliminate visibility of the tower and nacelle from Willard Pond and thus
12 substantially reduce its visual impact. Turbine #9 will now be 446.2 feet, which is a 45-foot
13 reduction from the prior proposal. AWE has also reduced the height of turbines # 1 – 8.
14 Turbines #1 – 8 will be 488.8 feet from foundation to blade tip. These changes collectively
15 represent a substantial difference in the configuration of the proposed facility.

16 The manufacturer and certain physical attributes of the turbines themselves will be
17 different. In Docket 2012-01, AWE proposed the construction of 10 Acciona AW 3000/116
18 wind turbine generators each with a nameplate capacity of 3 MW. The facility that AWE now
19 intends to construct in Antrim consists of nine Siemens Energy Inc. (“Siemens”) SWT-3.2-113
20 direct drive turbines, each with a nameplate capacity of 3.2 MW, or 28.8 MW in total. Each
21 turbine is a horizontal axis machine comprised of a tubular steel tower, a nacelle, and a rotor

1 with three blades. In addition to being shorter, the Siemens wind turbines are also smaller in
2 other dimensions: the tower diameter is reduced by 13% at the base and 15% at the top and the
3 length of the nacelle is reduced by 19%. Siemens is a larger and more experienced turbine
4 supplier than Acciona, with vast experience in the manufacture, installation, commissioning and
5 operation of turbines both globally and in the United States, including New England.

6 AWE has also made other changes to the Project proposal since it initially filed its
7 application in Docket 2012-01 in January 2012. As further discussed below, AWE has
8 significantly increased the mitigation associated with the Project by adding additional on-site and
9 off-site land conservation and entering into new agreements for additional community benefits
10 such as the agreement to fund recreational and aesthetic enhancements at the Gregg Lake Beach
11 area and the agreement to make annual contributions to the Antrim Scholarship Committee. All
12 of these new agreements are further described in the Application and in Appendix 10.

13 AWE's new application retains the many favorable components of the project reviewed
14 by the SEC in Docket 2012-01 while making significant and beneficial improvements to features
15 of the facility that previously caused concern.

16 **Q. What is the Project's anticipated capability to produce electricity?**

17 A. The generation capacity of the Project is proposed to be 28.8 MW. The Project
18 will consist of 9 turbines each with a nameplate generating capacity of 3.2 MW. Output from the
19 facility will vary depending on the wind speeds, but the facility is capable of and will produce
20 power during all times of day and year.

1 The design and efficiency of a wind energy generation facility is dependent upon a
2 variety of interrelated factors including terrain and land cover, wind speed and direction, and the
3 rated capacity and power curve of a given wind turbine generator. Antrim Wind estimates that
4 the Project will have an average annual net capacity factor of approximately 37.00%. Based on
5 this projected capacity factor, the Project is expected to produce approximately 93,346 Megawatt
6 hours (“MWh”) of electricity per year. The Project is anticipated to produce enough electricity
7 for the average annual consumption of approximately 12,310 New Hampshire homes. This
8 estimate is based on data from a 2009 report issued by the Department of Energy, Energy
9 Information Administration, which indicates that electricity usage per year for the average New
10 Hampshire home is 7,584 kilowatt hours (“kWh”).

11 **Q. Please explain how the power produced by the Project will be delivered to**
12 **the regional electricity grid.**

13 A. Between the ridgeline, where the proposed turbine string will be located, and
14 Route 9, to the north, is a Public Service of New Hampshire (“PSNH”) transmission corridor
15 containing both a 115 kV electric transmission line and a 34.5 kV electric distribution line.
16 AWE plans to interconnect the Project to the grid by building a substation to interconnect to the
17 115 kV line known as L163. This PSNH transmission corridor and point of interconnection is
18 approximately halfway between Route 9 and the northern-most turbine, and runs through
19 property currently leased by AWE. This interconnection will be accomplished via a new
20 substation to be built on property that is currently leased by Antrim Wind Energy, LLC.

1 The substation yard will be divided into two areas; one for collection and one for
2 interconnection. A single 34.5 kV three phase collector line will be constructed from the
3 collector substation to the individual turbines. The main collection line will follow the access
4 road, with each turbine connected to the main line via an underground connection. The main
5 collection line will consist of both underground and overhead lines. Underground lines will be
6 installed from WTG-9 to just east of the WTG-2 & WTG-3 spur road. From that point, the
7 collection line will be installed on overhead lines running adjacent to the access road. Where
8 the access road intersects the PSNH transmission line corridor, the collection line will be
9 installed underground to the collector substation.

10 The close proximity of the existing PSNH 115 kV line eliminates the need for new
11 transmission line construction, other than the Project electrical collector system lines, thereby
12 reducing any potential impacts by eliminating such additional development.

13 Alternatives Analysis

14 **Q. Please describe alternative sites for the Project that were considered by AWE**
15 **during the early stages of review and as the Project has progressed.**

16 A. Prior to settling on the Antrim site for the Project, alternative nearby sites in both
17 Stoddard and Marlow were considered. Ultimately, Marlow was determined to be less desirable
18 and potentially unsuitable due to a lack of nearby transmission resources as well as the presence
19 of extensive wetland resources. The Stoddard location was determined to be less favorable due
20 to siting complications arising from substantial amounts of land being under conservation
21 easements and increased difficulty with potential access to the area from existing roadways. The

1 Stoddard location was also less proximate to suitable interconnection options. The Antrim site,
2 after extensive review, was determined to be the preferred location and a suitable site for the
3 Project.

4 Within the parcels of land that have been leased by AWE for the Project, a number of
5 alternative designs were considered. The Project's current design is the preferred alternative
6 because it will provide for the most efficient and economic use of resources with the fewest
7 environmental impacts.

8 AWE's assessment of the site as a suitable site for a wind power project was affirmed in
9 many respects by the Order of Decision issued by the Committee in Docket 2012-01 which
10 found that the Project would not have an unreasonable adverse impact on public health and
11 safety, air and water quality, wildlife and the natural environment (subject to certain conditions
12 that AWE has incorporated into this Application). Likewise, the Committee concluded the
13 Project would not unduly interfere with the orderly development of the region. It is also
14 affirmed by the Town of Antrim's consistently expressed desire to host this Project in its current
15 location.

16 **Orderly Development of the Region**

17 **Q. Do you believe the Project will unduly interfere with the orderly**
18 **development of the region? Please explain your position.**

19 A. No, the Project will not unduly interfere with the orderly development of the
20 region. The installation of a renewable energy facility in a sparsely settled area of the State on
21 large tracts of private property is in concert with the orderly development of the region,

1 especially considering the site's close proximity to an existing transmission corridor and a state
2 highway. Development of a wind farm would be consistent with the surroundings, as there are
3 no significant environmental impacts. At the same time, the Project would provide substantial
4 additional tax base for the Town of Antrim without imposing the need for additional town
5 services, which could alleviate the need to attract alternate high-impact development.

6 Most of the Project impact will be temporary and forest management activities can
7 continue in the area. Thus, the Project will not prevent further development of other areas within
8 the town or region, it will not prevent other economic activities such as logging activities, to the
9 extent permitted, and it will not prevent orderly development of the region. The fact that the
10 municipal governing board, the Town of Antrim Board of Selectmen, has consistently supported
11 the Project over many years, provides an indication that the Project would facilitate, rather than
12 interfere with orderly development in the area.

13 **Q. Please describe AWE's interactions with municipal and regional planning**
14 **commissions and governing bodies.**

15 A. AWE began development of the Project in 2009 and has worked closely with the
16 Town of Antrim and all major local, State and Federal agencies to design, site and permit an
17 outstanding project for the State of New Hampshire. Throughout this consultative process, AWE
18 has attended and presented information at dozens of public, noticed meetings in Antrim,
19 including before the Zoning Board of Adjustment, Planning Board and Board of Selectmen. The
20 Project has also coordinated with Antrim Selectmen, the Town Administrator, and

1 communicated with the Antrim Conservation Commission, the Antrim Historical Society, and
2 the Police and Fire Departments.

3 In addition to the public positions taken by the Town's elected representatives, AWE has
4 considered the views of the Town of Antrim as expressed in its Master Plan. The Project is
5 consistent with Antrim Master Plan, which was updated in 2010. The Master Plan contains a 15-
6 page section addressing climate change, energy efficiency and renewable energy and calls for the
7 Planning Board and Planning Department to encourage renewable energy uses. The Project is
8 clearly consistent with these goals. Additionally, Antrim residents have consistently
9 demonstrated their support for commercial wind energy in Town: a) in 2010 the Antrim
10 Planning Board held a straw poll where 84% of respondents favored commercial wind energy
11 and 69% favored it in the rural conservation district; in February 2011, AWE conducted a town
12 wide mail and internet poll where 77% of respondents favored AWE's project; and in November
13 2011 Antrim voters rejected a proposal that would have prohibited large-scale wind facilities in
14 the rural conservation zoning district 584-225.

15 Outside of the Town of Antrim, the Project has met with the following officials and
16 organizations: New Hampshire Audubon, The Harris Center for Conservation Education, The
17 Nature Conservancy, The Society for the Protection of New Hampshire Forests, the Monadnock
18 Conservancy, Conservation Law Foundation, Conservation New Hampshire, the New Hampshire
19 Department of Transportation and the New Hampshire Division of Fire Safety.

20 AWE has entered into numerous agreements with the Town of Antrim. In November,
21 2014, AWE updated its Payment in Lieu of Taxes ("PILOT") agreement with the Town of

1 Antrim, which provides for significant and stable revenue to the Town of Antrim for the first
2 twenty years of the Project's life, paying the highest per MW payment of any PILOT agreement
3 for a wind project in New Hampshire. In addition, AWE has entered into an agreement with the
4 Town that governs many requirements during preconstruction, construction, operation and
5 decommissioning of the Project. To ensure AWE adequately addressed concerns identified in
6 the 2012-01 Docket with respect to aesthetic impacts, AWE also entered into a binding letter
7 agreement with the Town of Antrim concerning aesthetic impacts to the Gregg Lake Beach area.
8 AWE has committed to make a one-time payment of \$40,000.00 to enhance the recreational and
9 aesthetic experience at this location, which the Town has agreed is full and acceptable
10 compensation for any perceived visual impacts to the Gregg Lake area. AWE has also entered
11 into a conservation easement letter of intent to the Town of Antrim for one of the parcels to be
12 conserved by the Project and in 2015, entered into a letter agreement with the Trustees of Trust
13 funds to make a \$5,000 annual contribution to the Antrim Scholarship Committee.

14 **Consistency with State Energy Policies**

15 **Q. Is the Project consistent with State public policy and energy policies relating**
16 **to renewable energy and climate change?**

17 **A.** Yes, the Project is consistent with both State and local plans relating to the
18 development of renewable energy and climate change. The Antrim Project is widely supported
19 in the Town of Antrim among its residents and elected officials and is consistent with and
20 advances a number of important local and regional public policy goals, such as those contained

1 in New Hampshire’s renewable portfolio standard (“RPS”) law, the Regional Greenhouse Gas
2 Initiative (“RGGI”), the Antrim Master Plan and Antrim Open Space Plan.

3 The Project is consistent with the purpose of the RPS statute as it provides fuel diversity
4 to the State and the region’s generation supply through the use of a local renewable resource that
5 is completely emission-free and which can displace and lower dependence on fossil fuels. The
6 proposed Project will provide clean energy, which is consistent with the stated goals of New
7 Hampshire statutes, the Antrim Master Plan, and Antrim residents' desires as presented in the
8 Antrim Master Plan (2010) and represented by their elected Board of Selectmen. In addition, the
9 Project is consistent with RGGI because it will produce electricity without producing greenhouse
10 gases. The Legislature has determined that global climate change is a significant environmental
11 problem that can be addressed through reducing greenhouse gases such as carbon dioxide which
12 is produced by electric power plants that combust fossil fuels. By generating electricity without
13 using fossil fuels, the Project will assist in addressing the issue of climate change.

14 Additionally, the Project is consistent with state planning and zoning laws that require
15 support of renewable energy projects through planning regulations and zoning ordinances that
16 encourage the installation and use of renewable forms of energy such as wind projects.

17 **Public Health and Safety**

18 **Q. Will the Project have an unreasonable adverse effect on the public health and**
19 **safety? What steps will be taken to minimize or avoid impacts to health and safety?**

1 A. No, the Project will not have an unreasonable adverse effect on public health and
2 safety. I will summarize the basis for that assertion here. Art Cavanagh, Don Marcucci, and
3 Rob O'Neal will further elaborate on the details of these issues.

4 AWE is committed to building and operating the Project with the utmost concern for
5 public health and safety. Initially, it should be noted that the Project is located in a remote and
6 undeveloped area, away from inhabited structures. The nearest residence is one-half mile away
7 from the closest turbine. In addition, to prevent public access to the Project, the only access road
8 into the facility will be gated and locked. To address the use of the Project area by persons
9 granted permission for such use by landowners or otherwise, the Project will post signs no less
10 than 500 feet from the Project's WTGs along informal roads and trails to warn of the potential
11 risks.

12 The Project will not produce noise that will unreasonably adversely affect nearby
13 residents or the general public. A comprehensive sound level assessment was conducted for the
14 Project by Epsilon Associates, Inc, which was updated in February 2016 to address new SEC
15 rules pertaining to preconstruction sound studies. Please see the updated sound study and the
16 testimony of Rob O'Neal for further details on the completed assessment. The Project's
17 projected sound levels will be well below the standards outlined by the SEC in its decisions on
18 comparable wind turbine projects (Lempster Wind and Groton Wind) as well as community
19 noise guidelines published by the World Health Organization and the U.S. Environmental
20 Protection Agency. The Project's projected sound levels will also easily comply with the newly
21 established SEC sound level requirements.

1 Epsilon Associates, Inc. also produced a shadow flicker analysis. The SEC adopted new
2 rules that limit the amount of shadow flicker to 8 hours per year on non-participating residences,
3 and the Epsilon shadow flicker report was updated in February 2016 in accordance with those
4 rules. The Epsilon shadow flicker report identifies 150 receptors within 1 mile of any turbine
5 and demonstrates that 73 of those receptors could experience some shadow flicker. Of the 73
6 that could experience some shadow flicker, 49 are expected to experience between 0 and 8 hours
7 per year and 24 could potentially experience between 8 hours and 14 hours per year without any
8 operational controls. As described in Section I.6.d of the Application, AWE will utilize a
9 Siemens provided shadow control method to ensure that the 24 locations that are conservatively
10 expected to experience between 8 hours and 14 hours of shadow flicker per year, will not exceed
11 a total of 8 hours per year. The remaining 49 locations that will experience some shadow flicker
12 will not require AWE to implement any operational control measures to comply with the SEC
13 rule. The Siemens shadow control method will allow AWE to utilize operational controls to
14 curtail specific turbines that are identified as potentially causing shadow flicker in excess of the 8
15 hour maximum at any of the 24 locations to reduce the actual shadow flicker to no more than 8
16 hours per year.

17 The potential risk to the public due to ice shedding is minimal. Siemens' Wind Turbines,
18 which will be used for the Project, include safety measures should an icing event occur. If the
19 wind vane or anemometer is affected by ice (which typically occurs prior to any significant ice
20 buildup on blades), the wind turbine controller system will automatically shut down the turbine
21 and an error message will be logged. As further detailed in the testimony of Don Marcucci, the

1 wind farm supervisory control and data acquisition (“SCADA”) system also closely monitors
2 and reacts to potential icing events and automatically adjusts operations accordingly to prevent
3 hazardous conditions from developing. Finally, the remoteness of the facility and significant
4 distances between turbines and any public or private roads or structures further reduces any risk
5 to the public from ice shedding.

6 Tower collapse and blade throw incidents are extremely rare, and currently represent
7 minimal danger to public health and safety. Industry improvements in design, manufacturing,
8 and installation have greatly reduced such occurrences, as further described in the testimony of
9 Don Marcucci. Once again, even in the extremely unlikely event such a failure should occur, the
10 risk to the public is very low given the remoteness of the turbines.

11 Should a lightning strike occur, each turbine is equipped with lightning protection
12 equipment, which conducts the lightning from the blade to the tower via a grounding system.
13 This prevents damage to the blade, the tower, and the electrical components. As a result
14 lightning strikes do not present any danger to the health and safety of the public.

15 Fires associated with wind turbines are extremely rare. There are very few flammable
16 components. If any smoke is detected in the wind turbine, the SCADA system will
17 automatically shut the turbine down and send an alarm to the control room. Additionally, all
18 maintenance vehicles will be equipped with fire extinguishers and all maintenance personnel will
19 be trained to respond appropriately to smoke and fire events. AWE is committed to providing
20 appropriate training to local emergency responders and has met with the Antrim Fire Department
21 to keep them abreast of Project plans, and who we will continue to collaborate with. AWE has

1 also met with the State Fire Marshal's Office to discuss fire safety issues associated with the
2 Project. As a result of those discussions, AWE has committed to using Fire Trace active fire
3 suppression systems in the nacelle of each turbine and will continue to work cooperatively with
4 that Office to address any future concerns that might arise.

5 **Q. What other steps has AWE proposed to address potential public health and**
6 **safety issues?**

7 A. AWE has entered into an agreement with the Town of Antrim that addresses
8 many public health and safety issues. The agreement is substantially similar to agreements
9 between the Town of Lempster and Lempster Wind, LLC, and the Town of Groton and Groton
10 Wind, LLC, both of which were approved by the Committee. AWE's agreement with the Town
11 of Antrim addresses the following issues: warning signs; Town access to Project site; liability
12 insurance coverage; indemnification; visual appearance of the wind turbines; turbine breaking
13 systems and electrical components; Project site security; public information, communications
14 and complaints; incident and other periodic reports to the Town; emergency response; road
15 usage, maintenance, repair and reimbursement for special police details relating to construction
16 period traffic; other construction-related issues such as scheduling, debris disposal, blasting, and
17 vehicle usage; operating period requirements; noise restrictions; setback requirements;
18 decommissioning responsibilities; and environmental compliance commitments.

19 **Q. How will AWE handle response to emergencies?**

20 A. While emergencies that may present a risk to public health and safety at wind
21 farms are extremely rare, there are various types of emergencies that both Siemens and AWE

1 staff could be called upon to respond to. AWE has met with the State Fire Marshall's Office and
2 Antrim Fire Department to discuss emergency response, and AWE will complete the final
3 emergency response plan ("ERP") in cooperation with both entities prior to the commencement
4 of construction for the Project. The site specific ERP will also involve close coordination with
5 Siemens as the turbine SMA provider. AWE has provided a copy of Siemens' onshore wind
6 emergency response plan and rescue protocols as Appendix 20. DNV-GL will assist AWE in
7 completing the final ERP in consultation with the Fire Marshal, Antrim Fire Department and
8 Siemens and to ensure that AWE site staff have all necessary training to respond to any
9 emergencies at the site. Section J.6.k provides additional details on the elements that will be
10 included in the final ERP.

11 **Public Benefits**

12 **Q. Please describe the Project's effort to ensure that areas within and**
13 **surrounding the Project are protected from additional development in the future.**

14 A. In addition to providing significant clean energy and fuel diversity benefits to the
15 State, which can stabilize volatile energy costs resulting from overdependence on fossil fuels, the
16 Antrim Project features a unique and extensive conservation benefit package that will
17 permanently conserve over 908 acres of valuable forestland and wildlife habitat on or near the
18 Project site. All 908 acres are contiguous with one another and these lands also directly abut
19 other nearby conservation lands. The development of the conservation benefit package involved
20 extensive collaboration with local landowners, and many conservation organizations. This
21 package will result in significant perpetual benefits that advance many local and regional

1 conservation goals and are consistent with the generation of clean wind energy. As a result of
2 these conservation commitments the Project will permanently conserve over 16.5 times more
3 land than will be initially cleared for construction and over 78 times more land than will be
4 occupied by long term facilities – including more than 313 acres of the highest ranked habitat in
5 the State under New Hampshire’s Wildlife Action Plan and over 156 acres of the highest ranked
6 habitat in the region.

7 In addition to the “on-site” conservation lands, AWE has entered into a Land
8 Conservation Funding Agreement with the New England Forestry Foundation (“NEFF”),
9 whereby AWE will fund \$100,000.00 to NEFF to acquire additional conservation lands in the
10 region for the enhancement and maintenance of the region’s aesthetic character, wildlife habitat,
11 working landscape, and public use and enjoyment.

12 The Project would also provide wind lease revenues to the private landowners, resulting
13 in direct and indirect economic impacts locally. This income mitigates the need for the
14 landowners to develop the land for other permitted purposes such as residential subdivisions,
15 which in turn require more municipal services.

16 **Q. Are there any other agreements that AWE has entered into with other**
17 **stakeholders?**

18 A. Yes. In addition to the conservation benefit package described above and in
19 Appendix 10, and the direct agreements AWE has entered into with the Town of Antrim, AWE
20 entered into an Agreement with Appalachian Mountain Club in 2012 in order to satisfy all of
21 their concerns relating to potential aesthetic impacts of the Project.

1 **Q. Does this conclude your pre-filed testimony?**

2 **A. Yes.**