

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 DANA VALLEAU AND ADAM J. GRAVEL ON
BEHALF OF ANTRIM WIND ENERGY, LLC**

September 10, 2015

1 **Qualifications of Dana Valteau**

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

3 A: My name is Dana Valteau. I am employed by TRC Environmental Corporation
4 (“TRC”) as an Environmental Specialist. My business address is 14 Gabriel Drive, Augusta,
5 Maine 04330.

6 **Q. Please describe the services provided by TRC.**

7 A: TRC is a national engineering, consulting and construction management firm that
8 provides integrated services to energy, environmental and infrastructure projects. TRC serves a
9 broad range of clients in government and industry, implementing complex projects from initial
10 concept to operations. Antrim Wind Energy (“AWE”) has retained TRC to provide project
11 management, perform avian studies, identify and delineate jurisdictional wetlands and
12 waterways, vernal pools, and wildlife habitat within the Project are to support the design and
13 layout of the proposed Antrim Wind Project (the “Project”).

14 **Q. What are your responsibilities at TRC?**

15 A: My responsibilities include project management, scoping field studies,
16 consultation with agencies, and overseeing field studies. I also conduct field work as a wetland
17 scientist, wildlife biologist and environmental inspector on construction sites. I also provide
18 documentation of field study results, prepare permit applications and perform compliance
19 reporting.

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

21 A: I have a B.S. Degree in Wildlife Management from the University of Maine and a
22 Juris Doctorate also from the University of Maine. I have worked in the environmental science

1 field for over 20 years in a wide variety of capacities. I was certified as wildlife biologist in June
2 2011 through The Wildlife Society, a nationally recognized certification program for
3 professional wildlife biologists, and have been certified as a Professional Wetland Scientist since
4 May 2005 by the Society of Wetland Scientists, an international organization dedicated to
5 fostering sound wetland science, education and management. I have conducted/coordinated
6 wetland and vernal pool surveys and assessments on electric transmission line projects such as
7 the Central Maine Power Company Maine Power Reliability Project and also on the Kibby and
8 the Kibby Expansion Wind Power Projects in Maine.

9 Additional detail regarding my education, background and experience is contained in my
10 curriculum vitae which is attached hereto as Attachment DV-1.

11 **Q. Have you ever testified before the New Hampshire Site Evaluation**
12 **Committee (“SEC”)?**

13 **A.** Yes. I presented testimony on the results of bat field studies, as well as testimony
14 regarding the potential effect of the Antrim Wind Project on the natural environment, particularly
15 wetlands, vernal pools, and wildlife habitat, in connection with Antrim Wind Energy, LLC’s
16 (“AWE”) application for a certificate of site and facility in Docket 2012-01. I also testified
17 before the Maine Board of Environmental Protection on enforcement and licensing issues while
18 employed by the Maine Department of Environmental Protection, as well as before the Maine
19 Land Use Regulation Commission on behalf of the applicant in the Kibby and Kibby Expansion
20 wind power projects.

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Qualifications of Adam J. Gravel

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

A: My name is Adam Gravel. I am employed by Stantec Consulting (“Stantec”) as Managing Leader of Stantec’s Topsham, Maine office. My business address is 30 Park Drive, Topsham, Maine 04086.

Q. Please describe the services provided by Stantec.

A: Stantec is an environmental consulting company that provides services to a variety of sectors, including the wind industry. AWE is the sixth utility-scale project in New Hampshire for which Stantec has conducted pre-construction avian and bat studies. Between 2002 and 2014, the Topsham Maine office of Stantec conducted nearly 400 distinct seasons of pre-construction avian and bat studies in connection with proposed wind projects in twelve states. These include 172 seasons of acoustic bat surveys, 130 seasons of nocturnal radar surveys, and 109 seasons of raptor surveys. Stantec also has completed or is currently conducting eagle point count surveys consistent with the United States Fish and Wildlife Services’ (“USFWS”) Eagle Conservation Plan Guidance for 6 utility-scale wind projects (April 2013). Based on the results of on-site field surveys, Stantec has also prepared screening-level avian and bat risk assessments for a variety of wind projects, and has designed and conducted agency-approved post construction surveys at Projects in Maine, New York, Vermont, Pennsylvania, West Virginia, and Utah. Post-construction surveys are particularly helpful to determine if any relationships exist between pre-construction and post-construction survey results and overall

1 impacts to bird and bat species that result from wind energy projects. Stantec maintains regular
2 contact with state and federal resource agencies, including the New Hampshire Fish and Game
3 Department and United States Fish and Wildlife Service Region 5, and maintains continued
4 involvement with regional and national organizations, such as the National Wind Coordinating
5 Collaborative, National Renewable Energy Laboratory, Department of Energy, and Bureau of
6 Ocean Energy Management, to better understand and minimize potential wind energy-associated
7 wildlife impacts.

8 **Q. What are your responsibilities at Stantec?**

9 A: As the Managing Leader of Stantec's Topsham Maine office, I am responsible for
10 our business operation which includes 65 natural resources professionals comprising of wetland
11 scientists, ecologists, wildlife biologists, and regulatory specialists. For this project, I served as a
12 wildlife biologist and as a Project Manager, and was responsible for coordinating and conducting
13 the nocturnal avian migration studies and all acoustic bat and bat mist-net surveys for the Project,
14 as well as collaborating with TRC on additional avian studies and the development of the Bird
15 and Bat Conservation Strategy. My work experience over the course of the past 10 years with
16 Stantec has focused on large-scale avian and bat studies associated with wind power projects.

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

18 A: In 2003, I earned a Bachelor of Science degree in Wildlife Management from the
19 University of New Hampshire. I was hired by Woodlot Alternatives, Inc. (now Stantec) in 2004
20 as a Project Technician and radar ornithologist and was promoted to Project Manager in 2006. I
21 was promoted to Associate and managed the wildlife biologists from Stantec's Topsham Maine
22 office until recently when I was appointed the Managing Leader role of Stantec's Topsham,

1 Maine office. In addition, I am a certified wildlife biologist through The Wildlife Society, a
2 nationally recognized certification program for professional wildlife biologists. Additional detail
3 regarding my education, background and experience is contained in my curriculum vitae which
4 is attached hereto as Attachment AJG-1.

5 I have conducted and coordinated environmental studies as part of state and federal
6 permitting requirements for over 110 wind energy projects from Maine to Virginia. The subjects
7 of these studies include daytime raptor migration, nocturnal radar migration, acoustic bat
8 detector, and breeding bird surveys designed to assess potential direct impacts from proposed
9 wind energy projects. I have also assessed the potential indirect (non-collision related) impacts of
10 projects on wildlife, including habitat impacts and fragmentation effects, impacts to rare species,
11 and impacts to common, local wildlife communities.

12 My experience in New Hampshire includes managing and conducting numerous
13 nocturnal radar and acoustic bat surveys, diurnal raptor migration and breeding bird surveys, rare
14 plant and natural community surveys, winter tracking surveys for state-listed threatened and
15 endangered species, post-construction monitoring, and a peregrine falcon radio-telemetry study. I
16 have consulted with state and federal agencies to identify and discuss potential resources of
17 concern at proposed projects and also have developed work plans and associated field surveys to
18 address agency concerns about wildlife. I have conducted these studies for the three permitted
19 wind projects in the State of New Hampshire.

20 **Q. Have you ever testified before the New Hampshire Site Evaluation**
21 **Committee (“SEC”)?**

1 A. Yes. I presented testimony on the results of avian and bat field studies in
2 connection with Antrim Wind Energy, LLC's ("AWE") application for a certificate of site and
3 facility in Docket 2012-01. I also provided testimony in connection with the Noble/Granite
4 Reliable Power, LLC Project (SEC Docket No. 2008-04) and the Groton Wind, LLC Project
5 (SEC Docket No. 2010-01). I have also testified before the Maine Land Use Regulatory
6 Committee (LURC) in connection with the Bull Hill and Bowers Wind Projects (DP 4886 and
7 DP 4889, respectively), as well as before the Vermont Public Service Board in connection with
8 the Kingdom Community and Georgia Mountain Community Wind Projects (Dockets ## 7628
9 and 7508, respectively).

10 **Avian and Bat Field Surveys – Adam Gravel and Dana Valleau**

11 **Purpose of Testimony**

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

13 A. The purpose of our testimony is to briefly explain and summarize the results of
14 avian and bat field surveys conducted by TRC and Stantec on behalf of Antrim Wind Energy,
15 LLC ("Antrim Wind" or "AWE") for the Project. Complete presentations of the methods,
16 analysis, and results of each survey are contained in the following reports which are included as
17 Appendices to Antrim Wind's SEC Application:

- 18 • Breeding Bird Surveys (Appendix 12A);
- 19 • Diurnal Raptor Migration Surveys (Appendix 12B);
- 20 • Nocturnal Migration Surveys and Acoustic Bat Monitoring Survey (Appendix 12C);
- 21 • Rare Raptor Nest Survey (Appendix 12D);
- 22 • Bat Mist Netting Survey (Appendix 12E); and

1 TRC and Stantec completed these studies in connection with AWE's Application for a
2 Certificate of Site and Facility in Docket 2012-01. These studies remain valid to characterize the
3 wildlife and habitat found at the site. Site characteristics have not changed significantly since
4 these studies were performed, and it is very unlikely that wildlife use at the site has changed
5 appreciably in the short time that has passed.

6 Our testimony includes brief descriptions of the methodologies, investigations and
7 consultations related to the individual avian and bat studies referenced above, as well as a
8 discussion of the results of those surveys. Our testimony also describes and supports AWE's
9 Bird and Bat Conservation Strategy (BBCS) for the Project (Application Appendix 12F) which
10 includes proposed post-construction monitoring and minimization activities and an adaptive
11 management strategy.

12 **Q. Are you familiar with the Project proposed by AWE in this matter?**

13 A. Yes. TRC and Stantec conducted a number of avian and bat surveys within the
14 Project area. Over the course of these surveys, we visited all areas along the ridgelines where the
15 turbines and other Project facilities are proposed to be sited, as well as other areas within and
16 adjacent to the boundaries of the Project site.

17 TRC and Stantec have reviewed the design of the reconfigured Project that is the subject
18 of AWE's current Application for a Certificate of Site and Facility. Overall the current site
19 layout is smaller in area due to the removal of one turbine. The disturbed area required for
20 construction and operation is smaller and the proposed road lengths are shorter. Additionally,
21 the turbines currently proposed have a smaller rotor swept area than the original proposed
22 turbines, and also have a shorter overall height.

1 **Q. Are you familiar with the SEC’s finding in Docket 2012-01 with respect to**
2 **the effect of the Project on wildlife and the natural environment?**

3 A. Yes. After considering evidence submitted by several parties, including our
4 testimonies and the surveys listed above, the SEC concluded that the Project as proposed in
5 Docket 2012-01 would not have an unreasonable adverse effect on wildlife, and furthermore
6 would not have an unreasonable adverse effect the natural environment provided that certain
7 conditions were imposed. All of these conditions have been incorporated into the BBCS.

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9 **Q. What conditions did the SEC indicate would be required with respect to the**
10 **natural environment if it were to issue a certificate of site and facility?**

11 A. The SEC stated that the following conditions would be required to ensure that the
12 Project did not cause an unreasonable adverse effect to the natural environment:

- 13 • AWE would complete three (3) years of avian and bat post-construction studies in
14 addition to implementation of all of the provisions of AWE’s “avian and bat protection
15 plan” (now referred to as the BBCS) as amended in Docket 2012-01, including adaptive
16 management and phased consultation;
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- 18 • During construction of the proposed facility, logging operations shall be limited to
19 periods of time when the ground is dry or frozen;
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- 21 • AWE must use New Hampshire licensed foresters who will apply best management and
22 forestry practices such as those contained in the publication Good Forestry in the
23 Granite State for all of its logging and forestry operations;
- 24
- 25 • AWE’s plan to curtail invasive species shall be extended to the post-construction
26 period, as well as the construction period; and
- 27
- 28 • The BBCS shall adopt and include conditions contained in the October 26, 2012 letter
29 from NHFGD in Docket 2012-01.
- 30

1 **Q. Has AWE incorporated these conditions into its Application for Certificate of**
2 **Site and Facility and BBCS for the Antrim Wind Project?**

3 A. Yes. AWE has revised the BBCS to incorporate conditions proposed by the SEC
4 in Docket 2012-01. The permit condition recommendations made by NHFGD in Docket 2012-
5 01 are incorporated into the BBCS, as well.

6 **Q. In your opinion, have circumstances at the Project site changed since the**
7 **SEC issued its Order in Docket 2012-01 in a way that would result in the reconfigured**
8 **Project having a more significant impact to wildlife or the natural environment?**

9 A. No. In fact, the smaller footprint of the reconfigured Project lessens any potential
10 impacts to wildlife and natural environment. Moreover, AWE has adopted the conditions
11 proposed by the SEC and NHFGD in Docket 2012-01 and included them in its BBCS, ensuring
12 that the Project will not have an unreasonable adverse effect upon the natural environment.

13 **Q. Please explain how AWE determined which wildlife studies to conduct**
14 **relative to the Project, and how you developed the survey methods/protocols for the on-site**
15 **avian and bat studies.**

16 A. In accordance with the USFWS Land-Based Wind Energy Guidelines (“USFWS
17 Guidelines”), AWE applied a tiered approach to assessing potential risk to avian and bat species
18 associated with the proposed Antrim Wind Energy Project. A detailed description of the tiered
19 approach utilized by AWE is set forth in the BBCS attached as Appendix 12F to the Application.
20 Preliminary site evaluation and site characterization assessments performed to determine the
21 Project’s site suitability, which are described in the BBCS attached as Appendix 12F to the
22 Application, are consistent with Tier 1 and Tier 2 as described within the USFWS Guidelines. In

1 accordance with Tier 3 of the USFWS Guidelines, AWE consulted with various regulatory
2 agencies, including the USFWS, New Hampshire Fish and Game Department (“NHFGD”), New
3 Hampshire Natural Heritage Bureau (“NHNHB”), New Hampshire Department of
4 Environmental Services (“NHDES”), United States Army Corps of Engineers (“USACE”), and
5 United States Environmental Protection Agency (“USEPA”), to identify the pre-construction
6 surveys necessary to assess the Project’s potential impacts on avian and bat species. The scope,
7 duration and results of those environmental field studies are included in the BBCS. The findings
8 of AWE’s Tier 3 studies will provide the baseline, pre-construction reference data upon which
9 the Tier 4 post-construction monitoring, reporting and adaptive management efforts will be
10 based. In addition, AWE, Stantec, and TRC consulted with the NHFGD and USFWS in the
11 spring 2011 prior to conducting field surveys. This consultation resulted in the prescribed
12 preconstruction surveys listed above.

13 **Q. Has AWE consulted with the USFWS regarding the reconfigured Antrim**
14 **Wind Project?**

15 A. Yes. AWE contacted Sarah Nystrom at USFWS in November 2014 to discuss its
16 plans for the reconfigured project. During the discussions that ensued, USFWS requested that
17 AWE ensure that its BBCS reflect the most recent USFWS land based wind guidelines. On May
18 14, 2015, AWE submitted a letter to the New England Field Office of the USFWS requesting a
19 review of AWE’s updated and revised BBCS. AWE sought USFWS’s concurrence that the
20 updated BBCS meets the Service’s land-based Wind Energy Guidelines. In its letter, AWE
21 detailed revisions incorporated into the BBCS to conform to the USFWS’s most recent
22 guidelines, as well as address conditions proposed by the NHDES and the SEC subcommittee in

1 Docket 2012-01. Shortly after providing its letter, AWE met with USFWS on May 27, 2015 to
2 further discuss the updated BBCS and status of existing data collected at the site in 2011 by
3 Stantec for northern long-eared bats. A subsequent email from the USFWS on June 1, 2015
4 stated that bat survey data performed at the AWE Project is valid for 10 years unless changes in
5 northern long-eared bat populations warrant adjustments of that timeframe.

6 **Bird and Bat Conservation Strategy**

7 **Q. Please describe the Bird and Bat Conservation Strategy (“BBCS”) proposed**
8 **for the Project.**

9 A. AWE submitted an initial BBCS with its application for a certificate of site and
10 facility in Docket 2012-01, and subsequently submitted a revised BBCS on August 10, 2012 as
11 part of its first supplement to the application. In formulating the BBCS, AWE incorporated
12 recommendations and guidance from the following sources: USFWS Draft Land-Based Wind
13 Energy Guidelines; USFWS Final Land-Based Wind Energy Guidelines; USFWS Avian
14 Protection Plan Guidelines; the USFWS Eagle Conservation Plan Guidance, and the Edison
15 Electric Institute’s Avian Power Line Interaction Committee. AWE has further revised the
16 BBCS to incorporate certain conditions proposed by the SEC in Docket 2012-01 as well as the
17 permit condition recommendations made by NHFGD in the 2012-01 Docket. The complete
18 BBCS is contained in Appendix 12F. The BBCS is a customized, site-specific strategy that
19 includes an adaptive management plan that will allow for the continued monitoring, reporting,
20 learning, consultation and adaptation, as necessary, over the life of the Project.

21 In order to continuously address changing circumstances in the area of avian and bat
22 interaction at wind farms, and potentially changing circumstances at the proposed Project, AWE

1 will implement an adaptive management strategy for managing risk to birds and bats over the life
2 of the Project. Adaptive management allows decisions and actions to be tailored to specific
3 problems and circumstances (e.g., a specific species, location, weather pattern, wind speed, or
4 season) at the specific point in time at which they occur. Adaptive management will be guided
5 by: formal post construction study results documented during three year Evaluation Phase; a
6 continuous Wildlife Mortality Monitoring Program (“WMMP”), equipped with an Immediate
7 Alert Procedure (“IAP”) for reporting of unusual mortality events; and a phased consultation
8 process that includes AWE, USFWS and NHFGD. The adaptive management component of the
9 BBCS also includes the curtailment study during the first three years of operations, where four of
10 the nine turbines will have increased cut-in speeds as described in the BBCS and bat mortality
11 will be compared between those turbines that were curtailed and those that were not. The
12 WMMP, the IAP and the phased consultation process are described in detail in Appendix 12F.

13 **Q. Why is the BBCS an optimal approach to addressing the issue of avian and bat**
14 **mortality?**

15 A. Traditional post- construction monitoring programs merely document actual project
16 impacts and include no action steps intended to reduce mortality. In contrast, AWE’s BBCS is
17 structured around an adaptive management framework and includes detailed provisions for
18 avoiding, reducing, and mitigating potential impacts to birds and bats in a direct and timely
19 manner from the start of operation. The BBCS also offers the best use of project and agency
20 resources to study and address avian and bat mortality. By undertaking research into the effects
21 of targeted curtailment on mortality, the BBCS will advance the science of avian and bat
22 protection around wind farms. Thus, in our opinion, the BBCS attached as Appendix 12F to the

1 Application represents a superior approach to addressing and minimizing issues of bird and bat
2 mortality at the Project site. .

3 **Q. What is your opinion on the issue of whether the Project would create an**
4 **unreasonable adverse effect upon and avian, bat and other wildlife species?**

5 A. Based on our pre-construction surveys at the Project site, our evaluation of post-
6 construction avian and bat mortality data from other wind energy projects, and AWE's BBBS,
7 which incorporates the SEC's conditions from Docket 2012-01, it is our conclusion that the
8 Project will not have an unreasonable adverse impact to any bird or bat populations. AWE's
9 commitments to significant land conservation and radar activated lighting systems, as well as the
10 fact that the project has only reduced in size, reinforces our conclusion.

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Natural Environment – Dana Valleau

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Purpose of Testimony

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Q. What is the purpose of your testimony?

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A. My testimony supports AWE's Application for a Certificate of Site and Facility
for the Antrim Wind Project, specifically as it pertains to the potential effects of the Project on
the natural environment, including wetlands, vernal pools, and wildlife habitat. My testimony
summarizes the actions that AWE has taken to map, inventory, and review the natural resources
at the Project site, as well as analyze potential effects of the Project on natural resources. I also
discuss AWE's mitigation plans.

1 **Q. Are you familiar with the Project proposed by AWE in this matter?**

2 **A.** Yes, I am. AWE first retained TRC to assess the wetlands, vernal pool and
3 wildlife habitat effects of the Project as it was proposed in Docket 2012-01. In my role
4 overseeing the assessment of these effects, I conducted field reviews of the Project site and
5 assisted in site planning, and I have reprised that role in this case.

6 **Q. Are you also familiar with the SEC’s findings in Docket 2012-01 with respect to the**
7 **natural environment?**

8 **A.** Yes. After considering evidence submitted by several parties, including my
9 testimony on the issues discussed below and the Natural Communities Report attached as
10 Appendix 11A to the Application, the SEC concluded that the Project as proposed in Docket
11 2012-01 would not have an unreasonable adverse effect on wildlife or the natural environment,
12 provided that certain conditions were imposed. Those conditions are discussed in the previous
13 section. However, the SEC did not propose any conditions with respect to the matters discussed
14 below and, in fact, no parties disputed AWE’s determination that the Project would not impact
15 rare plant species or exemplary natural communities, a finding confirmed by the New Hampshire
16 Natural Heritage Bureau (“NHNHB”) after two separate site visits.

17 **Q. In your opinion, have characteristics of the Project site changed since the**
18 **SEC issued its Order in Docket 2012-01 in a way that would result in the reconfigured**
19 **Project having a more significant impact to wildlife or the natural environment?**

20 **A.** No. In fact, the smaller footprint of the reconfigured Project lessens any potential
21 impacts to wildlife and natural environment.

22 **Wetlands and Vernal Pools**

1 **Q. Please describe the area that was reviewed for potential effects on wetlands**
2 **and vernal pools.**

3 **A.** The proposed Project site is on the ridges of Tuttle Hill and Willard Mountain,
4 which are oriented east-northeast to west-southwest and approximately parallel to Route 9,
5 which is about $\frac{3}{4}$ of a mile to the north. The area is heavily wooded and undeveloped, though it
6 has been logged on a regular basis for a number of years, including the last two years. The Town
7 of Antrim has numerous water resources and the area of the Project straddles three watersheds in
8 the town: the North Branch River, Gregg Lake and an unnamed stream which continues to its
9 confluence with North Branch River at Steels Pond. The North Branch River, which was placed
10 in the NH Rivers Management and Protection Program in June 1991, runs along the north side of
11 Route 9, in the valley to the north of the Project area, and it is a major tributary to the
12 Contoocook River. Gregg Lake, in the valley to the southeast of Tuttle Hill, is approximately 195
13 acres and supports a moderate warm water fishery. Streams in the Project area include unnamed
14 perennial and intermittent streams which drain either to the north toward Route 9, or to the
15 southeast into Gregg Lake. There are very few perennial streams.

16 Under my direction, wetlands, surface waters and vernal pools were delineated
17 throughout the Project area. The surveyed area included approximately 462 acres. Area
18 characteristics have not changed significantly since TRC initially performed these delineations.

19 **Q. Please describe the methodology used by TRC to conduct an analysis of the**
20 **Project's potential effect upon wetlands.**

21 **A.** The methodology implemented by TRC is consistent with that used by
22 environmental experts to determine wetlands and vernal pool effects. TRC conducted field

1 studies in the spring, summer, and fall of 2011, and field study reports for the wetland and vernal
2 pool studies are included in Appendices 11C and 11D to the Application. TRC revisited the site
3 during the early fall of 2014 to confirm that the prior delineations and all the data collected
4 during the 2011 surveys remain valid. One additional wetland was delineated during the 2014
5 survey and it has been incorporated into AWE's project plans.

6 TRC wetland delineation crews surveyed proposed corridors during August, September
7 and November of 2011 using the United States Army Corps of Engineers ("USACE") Federal
8 Routine Determination Method as presented in the USACE Wetlands Delineation Manual
9 (USACOE 1987) and the Regional Supplements to Corps Delineation Manual (USACOE 2009),
10 which emphasize a three-parameter approach to wetland boundary determination in the field.
11 This approach involves the identification of: (1) evidence of wetland hydrology; (2) presence of
12 hydric soils; and (3) predominance of hydrophytic vegetation as defined by the National Plant
13 List Panel (Reed 1988). Positive indicators of all three parameters are normally present in
14 wetlands and serve to distinguish between both upland and transitional plant communities. TRC
15 also investigated hydrologic connectivity (drainage ditches, natural swales, intermittent and
16 perennial streams outside the study corridor where necessary to verify "normal conditions" or
17 "nexus" hydrologic determinations). Identified wetlands were classified according to Cowardin
18 et al. (1979).

19 TRC conducted an additional wetland delineation of approximately 4 acres at the Project
20 site in July 2012 after AWE supplemented its Application in Docket 2012-01 to include a second
21 temporary staging area (the "laydown yard") to be located on approximately 2.9 acres of

1 previously disturbed area that had been used as a gravel borrow pit and log landing, as well as
2 two temporary meteorological towers.

3 TRC conducted a review of the wetland delineations done in 2011 and 2012 in the early
4 fall of 2014 to confirm prior work and evaluate potential for changes in hydrology and
5 vegetation due to logging being performed on the site. A 2014 addendum to the original
6 wetlands report is included in Appendix 11C to the Application. One additional wetland was
7 delineated during this effort.

8 **Q. Please describe the wetlands identified in your surveys.**

9 A. TRC identified a total of 38 wetlands within the surveyed area and in relative
10 proximity to the proposed roads, turbines, collector system, the proposed transmission right-of-
11 way corridor, and other facility sites associated with the Project. These consisted primarily of
12 small forested wetlands that occur along skidder trails, in confined pockets in the regional
13 bedrock, in saddle areas along the ridgeline, and in areas with poorly drained soils that support
14 wetland vegetation. Of the 38 wetlands identified, 27 are deciduous broad-leaf forested
15 wetlands, three (3) are conifer forested wetlands, three (3) are a mix of forested and scrub-shrub
16 wetland types, and five (5) are scrub-shrub wetlands. Three (3) of the delineated wetlands within
17 the Project corridor consist of two or more wetland types, including three (3) streams with
18 associated palustrine wetlands (two intermittent and one perennial stream). The full wetland
19 report and the 2014 addendum is included in Appendix 11C of the Application.

20 When TRC conducted the additional wetlands delineation of the laydown yard in 2012, it
21 identified four wetlands and one intermittent stream channel segment. The wetlands found on
22 the eastern and western extents of the laydown site are broad-leaved deciduous forested wetlands

1 draining in a northerly direction where overland stormwater flow entered 30 inch concrete
2 culverts and traversed under Route 9 to a larger wetland complex. A third isolated broad leaved
3 deciduous scrub-shrub wetland was found along the southern border of the site. This wetland
4 was previously forested but trees had been removed by logging activity. The fourth wetland was
5 found within the borrow pit and is dominated by speckled alder shrubs. This wetland appears to
6 have been created during the excavation of the material in the borrow pit, and the use of the
7 laydown yard site will require that 955 square feet of this wetland be filled. The intermittent
8 stream channel was found to enter the site from the south and flowed towards Route 9. Before
9 reaching Route 9, the channel dispersed within wetland AN-LD-3. The wetland delineation
10 report for the second temporary staging area is included in Appendix 11C of the Application.

11 **Q. What are TRC's conclusions regarding the Project's potential effect upon**
12 **wetlands?**

13 A. The Wetlands Report and 2014 Addendum, attached as Appendix 11C to the
14 Application, and the laydown yard delineation report indicate that the Project will impact eleven
15 (11) wetlands permanently. In total, only 0.22 acres (9,573 square feet) of permanent wetland
16 impact (i.e., those which are deemed unavoidable during the Project planning process) are
17 expected to occur as a result of the construction or operation of the Project. This small amount
18 of impact is the result of careful planning and design to avoid and minimize impacts. Specific
19 details of each of these areas are included in the Site Specific Alteration of Terrain permit
20 application, which is included as Appendix 2B to the Application.

21 Because the level of permanent wetlands impact anticipated from the Project is below the
22 New Hampshire Department of Environmental Services ("NHDES") threshold of 10,000 square

1 feet, no compensatory mitigation is required. However, AWE will implement Best Management
2 Practices for working in and near wetlands during construction. These practices include
3 appropriate stormwater runoff and erosion control measures, which are described in more detail
4 in the Site Specific Alteration of Terrain permit application and the joint USACE/NHDES
5 Standard Dredge and Fill permit applications attached to the Application as Appendices 2A and
6 2B.

7 **Q. Please describe the methodology used by TRC to conduct an analysis of the**
8 **Project's potential effect upon vernal pools.**

9 For purposes of the vernal pool field effort, TRC adopted the definitions described by the
10 USACE Programmatic General Permit for the State of New Hampshire and the New Hampshire
11 Department of Environmental Services ("NHDES") rules for identifying vernal pools and vernal
12 pool habitat. The vernal pool surveys involved a field effort by two qualified biologists familiar
13 with vernal pool resources in New England which consisted of visual meander surveys
14 throughout the entire natural resources study area as depicted on the Natural Resource Survey
15 Map, illustrated on Figure J.5.b in the Application.

16 **Q. How did TRC identify and classify vernal pools?**

17 A. All vernal pool features identified were classified into three categories: (1) natural
18 vernal pools (those that meet criteria in state rules); (2) potential vernal pools, including those
19 identified outside the indicator species breeding season and that have the physical characteristics
20 described in state and federal definitions, but that will require a visit during breeding season to
21 confirm the presence of indicator species; and (3) non-jurisdictional features including all other
22 areas where amphibian breeding was documented but did not meet state and federal definitions

1 of a vernal pool. Field observations suggest that rainfall and snowfall quickly run off the ridge to
2 lower elevations, without collecting volumes that fill natural depressions or create natural ponds.

3 **Q. How many vernal pools did TRC identify?**

4 A. TRC identified a total of seven (7) features within the natural resource study area
5 during the vernal pool survey. Six (6) of these were identified as natural vernal pools and one (1)
6 feature was designated as a non-jurisdictional amphibian breeding area. No vernal pools were
7 found in the area surveyed for the laydown yard. All six (6) natural pools observed occurred in
8 natural isolated basins without an inlet or outlet and no populations of predatory fish. TRC did
9 not find or document fairy shrimp in any of the identified features, despite seeking them
10 intensively, and no rare or state-listed threatened or endangered species known to use vernal
11 pools for at least one critical life stage were documented in any of the identified features. A full
12 Vernal Pool Survey Report, including field data forms and site photographs is provided in
13 Appendix 11D to the Application.

14 **Q. What are TRC's conclusions regarding the Project's potential effect upon**
15 **vernal pools?**

16 A. The Vernal Pools Report prepared by TRC (Appendix 11D) indicates that the
17 reconfigured Project will not directly impact any jurisdictional vernal pools or areas currently
18 described as vernal pools as a result of the construction or operation of the Project.

19

20 **Q. Has AWE taken steps to mitigate the effect of the Project on wetlands and**
21 **vernal pools?**

1 A. A key consideration in the design of the Project was avoiding and minimizing
2 such effects. During the course of study and evaluation of the wetlands and vernal pools at the
3 Project site, the Project's impacts on those resources were carefully considered and have resulted
4 in a design plan that avoids and minimizes impacts. AWE has designed roadways to minimize
5 environmental impacts to important resources, including routing the access road to avoid
6 wetlands or vernal pools. Turbine sites and other Project components have been located to avoid
7 direct wetland and vernal pool impact to the extent practical. The proposed laydown area has
8 been defined with a 25-foot undisturbed buffer between graded areas and the remainder of the
9 wetlands and stream resources that were identified on the Project site. As indicated above, due
10 to the very small size of permanent wetlands impacts, no compensatory mitigation is required
11 under NHDES rules.

12 **Q. In your opinion, will the Project have an unreasonable adverse effect on**
13 **wetlands or vernal pools?**

14 A. No. For the reasons indicated in the above-described reports, it is my opinion that
15 the Project will not have an unreasonable adverse effect on wetlands or vernal pools.

16 **Natural Communities and Rare Plants**

17 **Q. Please describe the methodology used by TRC for conducting an analysis of**
18 **the Project's potential effects on natural communities and rare plants.**

19 A. TRC took a two- part approach to assessing the natural communities in the
20 vicinity of the Project. First, TRC conducted a desktop review of available data for the Project
21 area, including aerial photography, soils mapping, cover type, wetland and stream mapping,
22 aspect and elevation, bedrock geology, ownership and land management, and a review of data

1 available from the New Hampshire Natural Heritage Bureau (“NHNHB”). The second part of
2 the natural community assessment included a field survey intended to classify the landscape of
3 the proposed Project into discrete natural communities, and to identify any rare, threatened or
4 endangered plant species. The survey was completed using a random point sampling protocol
5 and data form developed in consultation with the NHNHB. The results of this survey are
6 summarized in Section J.5 of the Application and the full Natural Communities Report is
7 provided in Appendix 11A to the Application. The classification of the site’s natural
8 communities was done in accordance with the “Natural Communities of New Hampshire,
9 Second Edition” (Sperduto & Nichols, 2011). The study area for the natural community
10 assessment, approximately 460 acres, was the same as that assessed for wetlands, rare plants and
11 other natural resources and as depicted in Figure J.5.a of the Application.

12 Prior to field investigations, TRC consulted with the NHNHB in order to identify any
13 known or potential rare plant and/or natural community occurrences for the proposed site. No
14 historic records were found. No significant natural communities were identified as a result of the
15 Natural Community Survey. TRC followed up with the NHNHB in 2015 in order to identify any
16 new occurrences of known or potential rare plant and/or natural community for the proposed site.
17 No historic records were found that coincide with the Project site as a result of the 2015 NHNHB
18 data check. While some natural communities that have the potential to support rare or
19 uncommon species were observed in the study area, the species observed were generally
20 common and no rare plants or species of concern were found.

21

1 **Q. What do the Natural Communities and Rare Plant Reports conclude**
2 **regarding the potential effects of the Project ?**

3 A. TRC did not identify any significant natural communities or rare plants as a result
4 of its surveys. None of the surveyed communities in the Project area would qualify as being
5 “exemplary.” Because of these findings, there are no avoidance or mitigation plans specific to
6 these resources. A full study of the community types in the Project area is described in detail in
7 the study report included in Appendix 11A.

8 **Q. What was the NHNHB’s determination with respect to the Site?**

9 A. Staff of the New Hampshire Natural Heritage Bureau (“NHNHB”) visited the
10 Project site on December 13, 2011, and July 13, 2012. Based on observations during the site
11 visits, NHNHB has determined that it is unlikely that the Project will impact rare plants or
12 exemplary natural communities. Results of the NHNHB database review in 2015 had similar
13 results as the data base review performed previously for the site, with no rare or exemplary
14 elements identified that occur on the site.

15 **Q. In your opinion, will the Project have an unreasonable adverse effect upon**
16 **natural communities or rare plants?**

17 A. No. Based on our surveys, the proposed Project will not result in any effect upon
18 significant natural communities, rare plants or communities which are likely to support rare
19 plants.

20 **Wildlife Habitat**

21 **Q. Please describe the area that was reviewed for effects on wildlife habitat.**

1 A. The Project area is undeveloped and forested, and it includes diverse natural
2 resources that provide ample haven for a wide diversity of wildlife. The elevation of the site is
3 between 1,042 and 1,904 feet above mean sea level and thus it eliminates the potential for
4 impacts to sensitive high elevation alpine habitats. The area was once cleared for sheep farming
5 and therefore contains numerous stone walls. After the decline of sheep farming, the site re-
6 vegetated into a forested condition. It has been subject to industrial timber harvesting in the past
7 several decades and therefore it includes patches of forest in various stages of regeneration and
8 maturity, ranging from recent clear cuts and early successional stands, to mature forested areas.
9 For purposes of classifying community types, early successional forest areas were classified as
10 the community type into which they will develop. The site has a variety of cover types that are
11 typical of the lower hills and slopes of the Monadnocks of the Hillsboro Inland Hill and Plains
12 subsection of southwestern New Hampshire.

13 While abundant natural resources in and around the Project area provide ample
14 opportunities for many of New Hampshire's indigenous wildlife species, a desktop review of
15 known environmental factors indicated that no known critical habitat or endangered species were
16 present at the Project site. Consultations with state and federal agencies yielded the conclusion
17 that no wildlife habitat assessment report needed to be prepared for this Project. In a letter dated
18 October 13, 2011, the United States Fish and Wildlife Service ("USFWS") confirmed that "no
19 federally listed or proposed, threatened or endangered species of critical habitat under the
20 jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s).
21 Preparation of a Biological Assessment or further consultation with us under section 7 of the
22 Endangered Species Act is not required."

1 **Q. Has AWE taken any steps that will preserve habitat in the area?**

2 A. AWE successfully negotiated several local land conservation agreements which
3 will protect approximately 908 acres of land in and around the proposed Project. While this was
4 not necessary for mitigation of any potential impacts to natural communities, rare plants or
5 wildlife, these agreements will conserve in perpetuity valuable lands that are similar in character
6 and natural communities to those being developed in the Project area.

7 **Q. In your opinion, will the Antrim Wind Project have an unreasonable adverse**
8 **effect in wildlife habitat?**

9 A. No. For the reasons indicated above, we find no evidence to suggest that the
10 Project will not have an unreasonable adverse effects on wildlife habitat.

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

12 A. Yes.

13