THE STATE OF NEW HAMPSHIRE
SITE EVALUATION COMMITTEE
DOCKET NO. 2015-02
APPLICATION OF ANTRIM WIND ENERGY, LLC
FOR A CERTIFICATE OF SITE AND FACILITY

PRE-FILED DIRECT TESTIMONY OF MICHAEL J. BUSCHER
ON BEHALF OF THE AUDUBON SOCIETY OF NEW HAMPSHIRE
May 23, 2016

Qualifications of Michael J. Buscher

Q. Please state your name and business address.

A. My name is Michael J. Buscher and my business address is 301 College Street, Burlington, VT 05401.

Q. Who is your current employer and what position do you hold?

A. I am employed at T. J. Boyle Associates, LLC, Landscape Architects and Planning Consultants. I am a professional landscape architect and owner of the firm.

Q. Please summarize your educational and professional background and experience.

A. I received my bachelor's degree in Landscape Architecture from the Department of Landscape Architecture at the Pennsylvania State University in 1998, an accredited five year degree program. After graduating, I worked as a landscape architect in the greater Washington D.C. metropolitan area. In 2001, I moved to Vermont and joined T.J. Boyle Associates. In 2007, I became an owner of the firm. As part of my responsibilities at T. J. Boyle Associates, I have managed several project to assess aesthetic or visual impacts of proposed utility projects, including several electrical generation and transmission projects. As part of these assessments my office regularly prepares visualizations to help portray the visual conditions after a proposed project is constructed. A copy of my resume is attached as Exhibit MJB-1.

Q. What is the purpose of your testimony?

A. T. J. Boyle Associates, LLC was specifically retained to prepare video animations of the

proposed Antrim Wind Energy, LLC project (the "Project"). My testimony will introduce the exhibits prepared, explain the methodology to prepare the video animations, and describe how the animations and other exhibits should be properly viewed.

Q. Please describe the exhibits being introduced through your testimony.

A. T. J. Boyle Associates have prepared two video animations of the proposed Project. These are being provided digitally and are listed as follows.

Exhibit MJB-2 – Willard Pond Video Animation

Exhibit MJB-3 – Gregg Lake Video Animation

To have a 'printable' representation of the video animations, I am also introducing two single-frame photographic simulations that were created from still-frames exported from the video animations. These are included as:

Exhibit MJB-4 – Simulation 1: Willard Pond

Exhibit MJB-5 – Simulation 2: Gregg Lake

Q. Please describe the methodology employed in creating the video animations.

A. The first step in creating the video animations was to capture appropriate photography of the views to be used in the animations. A field investigation site visit was conducted on May 10, 2016. Photography was captured with a Nikon D7000 digital single-lens reflex camera ("DSLR") with a Nikkor DX AF-S 35mm prime lens. The lens is a fixed focal length lens with a 35mm equivalent focal length of 52.5mm. The camera was mounted on a tripod at approximately five and one-half feet above ground. Photo locations were documented with a Garmin GPSMap 64st unit. The coordinates for the two photo location are listed on the still-frame photo simulations.

Next, a digital three-dimensional model was created to replicate the Project and surrounding landscape in a virtual environment. AutoCAD 3ds Max, a professional 3D computer graphic program was used to create the digital model. Information included with the Project

application was used to model and locate the proposed turbines and a proposed permanent meteorological tower. The 3D model also includes the surrounding landform and other reference items, such as the shoreline or other landscape features visible within the captured photography that could be located accurately with aerial photos. Next, a virtual camera is set up at each of the viewpoint locations. Camera information, date, time of day and location data are used to replicate the view captured in the field with the virtual view in the 3D model. The photograph and virtual view are then registered with one another using topography, shorelines, and other landscape features included in the 3D model. Once the alignment of the 3D view exactly replicates the photographic view, animation data for the turbines was included in the model. The turbines are shown moving at 12 revolutions per minute. At this point, the 3D view is exported to be overlaid on the original photograph.

The model view of the animated turbines was exported from AutoCAD 3ds Max as a sequence of PNG image files. The sequence of images was then imported into Adobe Photoshop as a video sequence at 30 frames per second. The resolution of the imported video sequence matches the resolution of the original photographic image to maintain the proper alignment. The photographic image is then added behind the video sequence. At this point, a full image of each of the turbines is represented in the video. Masks within Photoshop were applied to remove portions of the turbines and rotating blades that will be screened by intervening landforms and vegetation. Other post-processing is done at this time, such as an introductory view that identifies the location, distance to nearest turbine, turbine type, and rotation speed. Once all components are completed, the videos were exported from Photoshop to an MP4 file, which can be played by most video viewers at a resolution up to 3479-by-2304 pixels.

Q. Please describe how the video animations and photo simulations should be properly viewed.

A. In order to allow the animations or simulations to best represent how the proposed Project will

appear from these locations if it were constructed, it is important to view these visualizations at the proper perspective and at the highest resolution possible. If the following directions are followed, the wind turbines will be seen with an appropriate visual scale. The rule-of-thumb to determine the proper viewing distance of a single-frame simulation (or animation) with a 40° horizontal and 27° vertical angle of view (i.e., a "normal" lens) is approximately twice the image's height—if the full image is 10 inches high, then the eye should be approximately 20 inches from the page or screen. The actual formula comes from Stephen R. J. Sheppard's 1989 book, Visual Simulation: A User's Guide for Architects, Engineers, and Planners, page 185:

Correct Viewing Distance = (½ Simulation Width) / Tangent (1/2 Desired Viewing Angle)

If a computer is used to view the simulations or video animations, then the monitor should be set to its highest available resolution and the viewing software should be set to full screen mode. The static simulations are designed to be printed on tabloid size paper (11-by17 inches) with a bright white paper intended for printing color photographs using the highest resolution and color settings available.

Q. Does this conclude your testimony?

A. Yes.