THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-__

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

TESTIMONY OF MATTHEW BORKOWSKI
ON BEHALF OF
GRANITE RELIABLE POWER, LLC

July 2008

Qualifications

Q. Please state your name and business address.

A. My name is Matthew Borkowski. My business address is 8 Railroad Ave, Essex, CT 06426.

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

A. I am employed by Noble Environmental Power. In my present position I am a Meteorology Analyst.

Q. What are your background and qualifications?

A. I hold a Master of Science Degree in Meteorology from North Carolina State University and Bachelors of Science Degree in Meteorology from Pennsylvania State University. I have been employed by Noble for over one and a half years.

Purpose of Testimony

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address the potential for shadow flicker impacts related to Granite Reliable Power, LLC's ("GRP") wind power project in Coos County, New Hampshire ("the Project") that is the subject of this Application.

Q. Are you familiar with the Project that is the subject of this Application ?

A. Yes, I am. I have reviewed the site plans and discussed the Project with the developer, and have visited the site of the proposed wind energy Project.

Shadow Flicker Analysis

Q. Have you conducted any assessments or evaluations related to the potential for shadow flicker from the operation of this Project?

A. In November of 2007, consultants for Noble Environmental Power carried out an analysis of the effects of shadow flicker from the Project. Shadow flicker is the periodic change in light intensity or shadows created by the moving turbine blades when back-lit by the sun. Because the alternation of shadows can be bothersome to nearby residences and businesses, shadow flicker has been analyzed to determine whether the Project will have unreasonably adverse effects on the public's health and safety. We have reviewed the analysis and believe that due to the remoteness of the Project site, no unreasonable adverse effects on the public's health and safety as a result of the shadow flicker are anticipated.

Q. Please describe the shadow flicker study conducted at the Project site.

A. The analysis was performed using a computer modeling program called WindPro with parameters specific to the Project wind turbines and geographic location, including turbine coordinates and elevation, rotor diameters, blade width, rotational velocity, and turbine hub heights.

Although Noble does not currently make use of WindPro in-house, according to WindPro's website, it is a model which has been created by EMD, a Danish software and consulting company specializing in renewable energy. EMD developed WindPro after having more than 20 years of experience in planning and designing wind energy projects. Among other things, WindPro is capable of generating energy estimates, visualization impacts, noise output, and shadow analyses for wind projects. The software is widely used by developers within the wind energy industry.

The model uses the Earth's orbital and rotational information. The passage of the sun was modeled over the course of one year, with shadow extent and duration calculations occurring at one minute intervals. The model was run in a "worst-case" scenario, also called the Astronomical Maximum Shadow scenario, to depict the maximum shadow extent and hours per year that any area could possibly be affected by shadow flicker from the Project. This scenario excludes external meteorological conditions, such as the probability of cloud cover, that would in reality decrease shadow impact and the frequency of time that the turbines would be both rotating and oriented perpendicular to the line between the turbine and the sun. By running the analysis in this mode, the model essentially assumes that the sun is shining all day, every day, and that

the rotor always covers the maximum portion of the sun. A description of this analysis has been included section (i)b of the Application.

Q. In your opinion will this Project have an unreasonable adverse effect on public health and safety, specifically from shadow flicker?

A. No, it will not. Since the nearest year-round residence is approximately 2.9 miles away, it is outside the area of any potential shadow flicker areas as referenced in Section (i)b of the Application. This conclusion is supported by the distance away from the Project at which potential shadow flicker will occur. This is shown in figures 23 and 24 in the Application, using both vegetation and bare earth modeling respectively. From the study, it can be concluded that any potential shadow flicker would occur within the immediate vicinity of the turbine and well away from any local residence or business.

Q. Are there any other comments you would like to make at this time?

A. No.

Q. Does this conclude your prefiled testimony?

A. Yes.

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