STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7628

Petition of Green Mountain Power Corporation,	)
Vermont Electric Cooperative, Inc., and Vermont	)
Electric Power Company, Inc., for a certificate of public	)
good, pursuant to 30 V.S.A. Section 248, to construct up	)
to a 63 MW wind electric generation facility and	)
associated facilities on Lowell Mountain in Lowell,	)
Vermont, and the installation or upgrade of	)
Approximately 16.9 miles of transmission line and	)
Associated substations in Lowell, Westfield and Jay, Vermont	)

BRIEF OF GREEN MOUNTAIN POWER CORPORATION RE: NOISE MONITORING PLAN

This Brief is filed on behalf of Petitioner Green Mountain Power Corporation ("GMP"), and addresses issues related to the approval of Petitioners' Noise Monitoring Plan ("Plan"), as required by Condition 41 of the May 31, 2011 Order ("May 31 Order") and the Certificate of Public Good ("CPG") in this docket, as amended. As demonstrated below, Petitioners' Noise Monitoring Plan as submitted to the Public Service Board ("Board") on October 7, 2011 complies with Condition 41, and should be approved without modification. GMP's Plan is more detailed and more stringent than the plan approved by the Board in Docket 7156 ("Sheffield Plan"), meets the requirements of Condition 41, and is fully supported by GMP's expert.

I. GMP'S PROPOSED PLAN IS CONSISTENT WITH THE REQUIREMENTS OF THE BOARD'S MAY 31 ORDER AND CPG.

Condition 41 of the Board's May 31 Order and CPG reads as follows:

> (41) Prior to commencement of construction, Petitioners shall prepare a Noise Monitoring Plan, subject to review by the parties and approval by the Board, which is consistent with the Plan recently approved by the Board in Docket 7156, but which extends from construction through the first two years of operations and includes: (a) monitoring for low frequency sound with the same regularity as monitoring for all frequencies; (b) a monitoring program to confirm under a variety of seasonal and climactic conditions compliance with the maximum allowable sound levels described above; (c) a means for ensuring that noise monitoring events shall be timed to coincide

with those time periods when Petitioners' modeling indicates the likelihood that the noise reduced operation ("NRO") will be triggered; (d) monitoring reports that document every instance when NRO mode is triggered, with a description of how NRO affected operations; (e) at the request of a homeowner, monitoring to ensure compliance with the interior noise standard; and (f) a process for complaint resolution shall be established for the entire life of the project.

A. GMP'S PLAN COMPLIES WITH THE REQUIREMENTS OF CONDITION 41 OF THE MAY 31 ORDER AND CPG.

The Plan complies with the requirements of Condition 41. First it is consistent with the requirements of the Sheffield Plan. Kaliski prefiled testimony ("Kaliski pf.") at 2. Consistent provisions include a 1.5 mile radius for the testing locations (Plan at 3, Sheffield Plan at 3), placement of monitors 25 feet from structures and 3 feet above ground level (Plan at 5, Sheffield Plan at 4), use of the same ANSI S12.9/Part 3 standard for a "prominent discrete tone" (Plan at 2, n. 1; Sheffield Plan at 1), an identical standard for estimating the interior sound pressure level at a complaining residence based on an A-weighted sound level (Plan at 9, Sheffield Plan at 7), use of the Leq and L90 standards (Plan at 7, Sheffield Plan at 5)[1], and identical methods for subtraction of background sound levels from the analysis (Plan at 7; Sheffield Plan at 5).

Second, the Plan, which has the required two year duration, addresses each of requirements a-f set forth in Condition 41:

a) Monitoring for low frequency sound with the same regularity as monitoring for all frequencies is set forth in the Plan at 5.
b) A monitoring program to confirm under a variety of seasonal and climactic conditions compliance with the maximum allowable sound levels is set forth in the Plan at 3.
c) A means for ensuring that noise monitoring events shall be timed to coincide with those time periods when Petitioners' modeling indicates the likelihood that the noise reduced operation ("NRO") will be triggered is set forth in the Plan at 2.

[1] There does not appear to be any disagreement between the parties as to the appropriate use of the Leq and L90 standards as their use is consistent with the Sheffield Plan. See Transcript 12/13/2011 at 137 (Blomberg); Kaliski pf. at 13.

d) Monitoring reports that document every instance when NRO mode is triggered, with a description of how NRO affected operation are required by the Plan at 3.

e) At the request of a homeowner, monitoring to ensure compliance with the interior noise standard. See Plan at 5.

f) A process for complaint resolution is established for the entire life of the project; See Plan at 8 *et seq.*

B. ADDITIONAL PLAN PROVISIONS ARE MORE STRINGENT THAN THE SHEFFIELD PLAN

GMP's Plan also contains provisions that are more stringent than the Sheffield Plan and/or required by Condition 41: the use of nine monitoring periods (GMP Plan at 3) rather than four (Sheffield Plan at 2), a more detailed description of what the reports will contain (GMP Plan at 8; Sheffield Plan at 6), conducting the test when at least 90% of the wind turbines are expected to be operating at their maximum sound power (GMP Plan at 2) rather than when "wind speeds are adequate to enable the turbines to operate periodically" (Sheffield Plan at 2), requiring that microphones be positioned in such a way that the line of site to the wind farm is not blocked (GMP Plan at 5), and requiring ground meteorological instruments (GMP Plan at 5).

Other Plan provisions are designed to address Towns' concerns and are also more stringent or more specific than the Sheffield Plan. Three examples set forth in Exh. Pet. KHK-5 are: a) the ability to do additional monitoring to establish background sound levels or investigate complaints (see Exh. Pet. KHK-5 at 3, comment k4); b) the acceptance of the concept of notification for any changes in NRO mode of the turbines (see Exh. Pet. KHK-5 at 3, comment k6); and the enumeration of specific meteorological instrumentation (see Exh. Pet. KHK-5 at 6, comment k15). In other places, GMP has altered the wording of its Plan to address Town/LMG concerns. See e.g. Exh. Pet. KHK-5 at 6, comments k12, k13, k15 (accepting Towns/LMG's comments, in some cases with wording modification).

In addition, GMP agrees with the Department of Public Service ("Department") proposal made during the December 13, 2011 technical hearing to have the first two two-week study results monitored by a neutral third party. Tr. 12/13/11 at 81, 109 (Kaliski). GMP believes that the Department's suggestion has merit and that the view of an unbiased observer will be useful to the Board in evaluating Plan data. While not a feature of the Sheffield Plan, GMP supports a Board order approving the Plan containing this requirement.

As the evidence in this proceeding shows, GMP's Plan is consistent with the one approved by the Board in Docket 7156 and contains all of the additional features required by Condition 41. Moreover, the Towns and LMG do not allege, and there is no testimony to support an allegation, that GMP's Plan fails to comply with PSB's order or the Sheffield Plan. GMP's Plan should therefore be approved.

II. THE TOWNS AND LMG'S PROPOSED CHANGES TO GMP'S PLAN SHOULD BE REJECTED

The Towns and LMG's proposals seek to substitute standards of their own creation for the standard set forth by the Board in Condition 41. The additional standards include:

- Compliance with "worst case" sound power levels and atmospheric conditions during testing, rather than the testing during the normal range of conditions experienced on Lowell Mountain (Blomberg pf. at 1);
- Additional monitoring sites (*id.* at 4,7),
- A 168 hour "usable" data requirement (*id.* at 4), during which there is no rain and wind speeds at ground levels below 5 meters per second (Tr. 12/13/2011 at 121-122 (Blomberg));
- Sound monitoring during project construction (Blomberg pf.at 3);
- Shorter distances to monitoring structures than used in Sheffield (6 feet rather than 25; *id.* at 4);
- Data gathering at the project neighbors' property lines plus a set-back rather than at their residences (Tr. 12/13/2011 at 130 (Blomberg);
- Alteration of the ASTM standard (Blomberg pf. at 5);
- A requirement that all turbines be operating in order for the noise data to be considered (*id.* at 2; Tr. 12/13/2011 at 121-122 (Blomberg)); and
- Turbines monitored producing sound at their maximum output for at least 48 hours (Tr. 12/13/2011 at 121-122 (Blomberg)).

However, none of these additional standards are included in the Sheffield Plan (or based on standards articulated in the Sheffield Plan) and the Board should reject their imposition here.

A. THE TOWNS AND LMG'S PROPOSALS CREATE STANDARDS DIFFERENT THAN THE REQUIREMENTS OF CONDITION 41 AND THEREFORE DO NOT CONSTITUTE A COMPLIANCE FILING.

The purpose of these post-CPG proceedings is to evaluate whether GMP's Plan meets the standard set by the Board, rather than offering a chance to relitigate those standards or set a new ones.[2] The Towns and LMG's additional proposed changes do not meet the standard for a compliance filing on noise testing issues; instead they constitute new standards for noise testing, are thus inconsistent with the May 31 Order, and should be rejected.[3] In Docket 7156, which established the basic noise testing standard at issue here, the Board rejected project opponents' attempt to alter noise testing standards after they had been set by the Board.[4] If the Board does otherwise here, the Towns and LMG will be encouraged to ask for changes to the standards applicable to every compliance filing GMP makes, leading to wasteful, duplicative litigation. The new standards proposed by the Towns and LMG should be rejected because the Board has already set the standard in Condition 41.

B. THE TOWNS AND LMG'S CHANGES SHOULD ALSO BE REJECTED AS INCONSISTENT WITH THE BOARD'S ORDER AND ON POLICY GROUNDS

The Towns and LMG's suggested changes to the Board's Sheffield standard fall into three broad categories:

1. Extension of noise monitoring to the project's construction phase;
2. Changes to the field conditions allegedly necessary to consider data "useful," including use of "worst case" sound and power levels conditions as a requirement for "usable" data, of

[2] As the Board indicated in its instructions to the parties in this case regarding the noise plan compliance filing, "[T]he purpose of the hearing and its related process is to provide the Board with additional evidence on some of the remaining points of dispute," rather than "an opportunity to relitigate issues that were already decided by the Board in this proceeding." Docket 7628 Board Memorandum of October 20, 2011 at 4.

[3] Adoption of the Towns' standards would also modify the noise monitoring plan-related obligations imposed on GMP by the May 31, Order. As the Board has previously stated, and the Towns have conceded, the Board has no authority to modify its May 31 Order because it is on appeal. Docket 7628 *In re Petition of Green Mountain Power et al.*, Order re Albany and Craftsbury Motion for Reconsideration (Vt. Pub. Serv. Bd., Aug. 30, 2011) at 2. In contrast, the standards that are more stringent or detailed than those in the Sheffield Plan have been agreed to by GMP, rather than imposed by the Board.

[4] See Docket No. 7156, *Amended Petition of UPC Vermont Wind, LLC*, Order Denying Motion To Alter (Vt. Pub. Serv. Bd., Feb. 11, 2011) at 4. ". . .even if we were to address the arguments presented in RPI's motion, we would reject them. . . .."

silent or nearly silent levels of background noise, 168 hour useful data requirement, 100% turbine operation during monitoring; and

3. Changes to the physical manner in which data is gathered and the technical standards used to assess it, including additional monitoring sites, shorter distances to structures for monitors, use of line-of-sight monitoring locations only, monitoring noise at property lines, and departure from the ASTM standard.

a. Construction

It is uncontested that the data-gathering period required by Condition 41 is during the project's operational, rather than its construction phase. May 31 Order at 165; Tr. 12/13/2011 at 133 (Blomberg).[5] This a typical example of the Towns and LMG seeking to substitute the standards they hope for rather than assessing whether GMP has met the standards actually imposed on the Board. The following exchange between Mr. Zamore and Mr. Blomberg from the December 13, 2011 technical hearing is illustrative:

Q. Can you tell me what noise standard is applicable during the construction period?

A. I don't think it's entirely clear. . . Mr. Kaliski did monitor -- model the construction noise, and I would hope that the Board would use the same standard.

Q. I didn't ask you what the Board hoped.

A. I don't think it's clear.

Q. Well what -- you don't have any idea what the standard is during the construction phase?

A. I don't -- I don't think that the Board -- I don't think it's clear to me that the Board has a standard for that.

Q. So they required -- they required the noise criteria to be applied, but you don't know what the standard is?

A. I don't know. No. No. That's not what I said. I don't think it's clear, and I think that's one reason for this is to get clearer on whether the standard applies and I don't think it's clear.

. . . .

[the witness reads back a portion of the Board's May 31 Order.]

Q. And you still think that the Board's order requires a noise standard during construction?

A. Like I said, I do not think it's clear. It doesn't look like it does, but I think it should.

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[5] See also the Board's July 27, 2011 Order at 6: ". . .[W]hile Condition 41 requires that, prior to construction, the Petitioners prepare and file the plan for review and approval, it does not specifically require GMP to obtain Board approval in order for construction to commence. *Such a requirement would be unrelated to the purposes of a sound monitoring plan, which is not needed until commercial operations begin.*" [emphasis added]. Mr. Kaliski has stated that sound monitoring will take place during construction to assess the suitability of background monitoring locations. Kaliski pf. at 5.

Q. Oh, you think it should?
A. Yeah.
Q. Okay. I thought you said before that you thought it did?
A. I thought it did.
Q. You thought it did?
A. I think it should.

Tr. 12/13/2011 at 131-133 (Blomberg) (emphasis added)

As the Towns and LMG's witness was forced to concede, the Board's May 31 Order does not mention monitoring during construction or articulate a standard for such noise and the Towns and LMG's arguments to the contrary should be rejected. *Id.*

b. Changes in Allowed Field Conditions

The Towns and LMG's request to limit the acceptable data set to that gathered during the specific conditions advocated by the Towns and LMG will result in costly additional testing and is unnecessary. Weather cannot be forecast with enough accuracy to permit testing only during the conditions for which the Towns and LMG propose. As established during technical hearings, weather at the project site can only be accurately predicted three or four days in advance. Tr. 12/13/2011 at 20 (Kaliski); Tr. 12/13/2011 at 123 (Blomberg). In addition, each additional two-day monitoring trip to the test site will cost approximately $2,000 per monitoring location. Tr. 12/13/2011 at 10-11 (Kaliski).[6] Additional monitoring and use of the Town/LMG standards would thus add costs to administering the monitoring plan without any appreciable benefit.

The Towns and LMG's new standards are unnecessary because the wide variety of conditions captured by GMP's Plan will provide a high degree of assurance that the maximum sound level during the two-year period will be captured. Ken Kaliski has testified without contradiction that for the Plan's two years the likelihood of gathering the necessary data is 100%. Kaliski pf. at 4; Tr. 12/13/2011 at 22 (Kaliski). Mr. Kaliski also testified that the Towns' and LMG's worst-case scenario testing conditions are not required because of the extensive amount of data that the Petitioners' proposed plan will generate. Tr. 12/13/2011 at 97 (Kaliski).

[6] Mr. Kaliski also testified that the Towns and LMG's proposed requirements for a minimum amount of useful data would add approximately $50,000 in additional costs to the monitoring plan. Kaliski pf. at 5. For this reason, among others, the Town/LMG suggestion to add an additional monitoring site at the Dyer Dunn camp should be rejected.

c. Data Gathering Methods and Locations

The Towns and LMG propose that GMP be required to monitor noise at property lines using a minimum set back (Blomberg pf. at 2-3; Tr. 12/13/2011 at 130 (Blomberg)), place monitors as close as six feet from residences (Blomberg pf. at 4), inappropriately use a method described in ANSI S12.9 Part 3 to eliminate background sounds that is only applicable to short-term monitoring with an observer present (Blomberg pf. at 7) and use "worst case" monitoring (Blomberg pf. at 1). The Towns and LMG's proposals should be rejected because they misapply the standard, are inconsistent with the Sheffield Plan and are not technically sound.

The placement of the microphones has been clearly spelled out in the GMP Plan, and is consistent with the Sheffield Plan and the ANSI S12.9 Part 3 standard, which recommends placement at no less than 25 feet from structures. Kaliski pf. at 7. Further, the microphone positions will have a clear view of the wind farm to the extent feasible. In addition, the 45 dBA standard is based on a sleep disturbance guideline and therefore it is important that the outside sound measurement be conducted in a way that facilitates an accurate inside measurement. If the microphone placed closer than 25 feet to the residence, then reflections off the walls of the home could increase the level of monitored sound by as much as 3 dB, and would not be appropriate for use in determining the level of sound inside the residence. Kaliski pf. at 8.[7] Mr. Kaliski testified that micrositing of the microphone could be confirmed by a third party hired by the Department (Tr. 12/13/2100 at 109 (Kaliski)) and GMP would support this approach.

Despite the Towns and LMG's attempt to create a new standard for microphone placement, there is no current Board standard requiring placement of microphones in a "worst-case" location. In practical terms, the monitoring location is often constrained by landowner restrictions, other sound sources, and other limitations on placement. GMP's proposed monitoring plan therefore allows flexibility in the microphone position. The proposed plan provides for the placement of the microphone adjacent to a residence (or representative of the residence) with the fewest line-of-sight obstructions to the project. As long as this is the case, the monitoring should capture representative project sound levels. Kaliski pf. at 8. The Town/LMG effort to impose a new "worst case" standard should be rejected.

[7] Section 2.5 of the Plan refers to the four monitored locations specified in GMP Plan Section 2.3. These locations were chosen because they are the representative of residences nearest to the project. Section 5.0 of the Plan, however, provides that GMP will conduct outside-to-inside measurements at additional locations if the requirements of Section 5 are met. Kaliski pf. at 9.

The ASTM test procedure requires alignment between the source and receiver and therefore the LMG/Town proposal is redundant. [Section 8.2.3, ASTM E966-10] In practice, the effect is likely to be insignificant. As an example, the angle from the Nelson residence to the closest turbine is 11 degrees. Assuming a speaker distance of eight feet from the house, the speaker height above the window centerline would be only 1.5 feet. Kaliski pf. at 9. Mr. Blomberg admitted in testimony that his critique was, in part, based on the older ASTM E966-04 standard used in the Sheffield Plan and not the revised ASTM E966-10 standard proposed in the GMP Plan. Tr. 12/13/2011 at 140 -141 (Blomberg). The Towns and LMG's proposal regarding a departure from the ASTM test procedure should be disregarded.

Regarding the methodology to eliminate background sounds, ANSI S12.9 Part 3 requires that an observer be present; GMP's Plan relies instead, as did the Sheffield Plan, on recording devices. The GMP Plan does, however, incorporate the use of sound recordings and spectrograms to help identify sound sources, similar to the intent of ANSI S12.9 Part 3, but requires that GMP perform these analyses after the measurements are complete rather than having an observer on site. Kaliski pf. at 10-11. This approach is more practical (i.e. cost-effective), particularly for the amount of data that GMP's plan will generate over its term. Kaliski pf. at 10.[8] During cross-examination, Mr. Blomberg agreed that this approach set forth in GMP's Plan is consistent with the purpose of the ANSI S12.9 Part 3 standard. Tr. 12/13/2011 at 141 (Blomberg).[9]

With respect to Method 2 for establishing background sound levels, because all four primary sites will be monitored for compliance simultaneously, *all* turbines will be shut down to establish background noise levels at these sites. For testing to resolve individual complaints, twelve turbines would be shut down to establish background noise levels at that specific location. GMP's sound consultant used propagation modeling to establish the number of turbines needed to shut down to assure that the noise levels are limited to background noise. RSG's modeling demonstrated that a drop of more than 7 dBA in wind turbine noise is more than sufficient to establish whether or not the wind farm complies with the CPG standard. See Kaliski pf. at 11-12.

[8] GMP will use the Maine Board of Environmental Protection method of establishing background sound levels, which defines 12 valid 10-minute samples as sufficient data for Method 1. Kaliski pf. at 11.

[9] 16 "MR. COTTER: Okay. And then also similar vein, use of audio recording to identify short term noise events. Are you folks basically on the same page now on that do you think?

MR. BLOMBERG: Sounds like it."

With respect to Method 4 and Method 5, GMP's Plan will produce valid results and do not require modification. Concerning Method 4, Section 2.6 of the proposed Plan provides that a background site will be rejected if the margin of error is greater 2 dB. There is no directional bias to this method; overestimation and underestimation of the actual background level are equally likely. Kaliski pf. at 12; Bloomberg pf. at 8. Method 5 involves establishing a correlation between wind speed and background sound level. Since there were no anemometers on the ridgeline during the time background sounds were measured for the Noise Report (Exh. Pet.-KHK-2), GMP cannot use that data for Method 5. Instead, Method 5 requires new sound monitoring at the four sites and simultaneous ridgetop collection of wind speed data.[10] The background noise levels are based on a regression model comparing ridgetop wind speed to background sound level at the monitoring locations.

Finally, the Towns and LMG request that the Board require the Gebbies' property be included in any noise testing regime. Blomberg pf. at 3. Including the Gebbies' property in the study area is inappropriate because the property owners have waived any noise-related claim concerning the construction or operation of the wind farm.[11] For this reason, there is no basis for conducting testing at their camp. There are five residences within one mile of the project along Eden Road where monitoring could take place, rather than at the Gebbie camp.[12]

In summary, the Towns and LMG thus seek to impose a variety of standards instead of the ones used in the Sheffield plan; adopting these new standards would result in a noise monitoring plan inconsistent with the Sheffield Plan. Rather than provide the Board with evidence about the consistency of GMP's Plan with the Sheffield Plan (an issue not even addressed in Mr. Blomberg's testimony) the Towns and LMG are attempting to relitigate the

[10] The Towns and LMG agree that new monitoring would be necessary using Method 5. Bloomberg pf. at 8.

[11] The Gebbie property is owned by Wind Blown Energy LLC, which has granted GMP an easement for emission of noise or sounds caused by construction or operation of the wind project, among other things. See Wind Farm Neighbor Easement Agreement dated as of January 29, 2010 between Wind Blown Energy LLC and GMP, recorded in the Town of Lowell land records March 11, 2010 and filed with the Board January 6, 2012, at 1. "Owner grants to Grantee an easement, right and entitlement on, over, across and under Owner's Property for any of the following caused by or arising from (a) operations or activities of any Wind Farm or (b) the facilities of any Wind Farm now or hereafter located on the Wind Farm Property: . . . . (vi) emission of noise or sounds caused by the construction or operation of the Wind Farm."

[12] Kaliski pf. at 7. .Similarly, with respect to the Route 100 monitoring site, according to the Vermont E911 database, there are seven residences that are closer to the project in the vicinity of the Christiansen residence, the closest being about 5,780 feet away. The monitoring plan allows for monitoring at a closer residence than Christiansen along VT 100 if a location can be found. *Id.*

question of what standards should be used in establishing the Plan. The Board should deny the Towns and LMG's attempt to have new standards imposed.

III. CONCLUSION

For all of the above reasons, GMP's proposed Noise Monitoring Plan complies with Condition 41 of the Board's May 31, 2011 Order, as amended, and the Board should approve the same. Because the Towns have not, and cannot, demonstrate how the plan they propose is consistent with the plan approved by the Board in Docket 7156, their suggested changes to the Plan should be rejected.

Dated January 20, 2012 at Burlington, Vermont.

GREEN MOUNTAIN POWER CORPORATION

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