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September 19, 2014

By Hand Delivery and E-Mail

Mrs. Susan Hudson, Clerk
Vermont Public Service Board
112 State Street, Drawer 20
Montpelier, VT 05620-2701

Re: Docket No. 7508 - Georgia Mountain Community Wind, LLC

Dear Mrs. Hudson:

On behalf of Georgia Mountain Community Wind, LLC ("GMCW"), I am providing GMCW's reply to the August 29, 2014 e-mail from Barbara McDaniel to the Board concerning alleged noise impacts at her residence that she attributed to operation of the GMCW Project.

GMCW takes every complaint concerning the Project seriously and in the first instance always endeavors to work directly with surrounding residents. GMCW attempted to address Ms. McDaniels' concerns immediately upon receiving a call from her and prior to her email to the Board. GMCW requested further information from Ms. McDaniel about the potential noise impacts, however for reasons unknown to GMCW, Ms. McDaniel did not provide anything further.

To respond to the Board's directive, GMCW investigated this complaint in two ways: it reviewed and applied the complaint procedure contained in the Board-approved *Post-Construction Sound Monitoring Protocol*,[1] and second, by reviewing operational data for the period of time referenced by Ms. McDaniel in her complaint. GMCW offers the following information to the Board based upon this review:

Complaint Procedure

The McDaniel residence is located 2.2 miles south of the GMCW project. It is more than twice the distance as compared with the South Monitor (0.9 miles) which was utilized for GMCW's pre-construction sound modeling and first year compliance monitoring.[2] Further, the McDaniel residence is separated from the GMCW project by an intervening ridge, which obstructs line-of-site connection between the residence and the turbines.

As the attached memorandum from RSG indicates, the first year monitored results for the South Monitor were 40 dBA (5 dBA lower than the CPG's exterior noise limit of 45 dBA). In addition, the modelled and extrapolated sound levels estimated at the McDaniel residence were substantially lower than the South Monitor, 17 dBA and 32 dBA, respectively. These figures are well

[1] Revision dated January 3, 2012, in response to Board approval by Order dated October 31, 2012.

[2] Sound Compliance Monitoring Report dated March 18, 2014, filed on March 19, 2014.

* Also admitted in DC | * Also admitted in MA | * Also admitted in SC | * Also admitted in MA; Pat. Reg. 61653 | * Also admitted in NY

below a projected sound level that would trigger the requirement for site-specific sound monitoring under the Board-approved Sound Monitoring Protocol.[3]

The McDaniel complaint also mentions the possibility that the GMCW was generating infrasound that was travelling to the residence. The attached RSG memo addresses infrasound and why it is not likely to be causing issues at the McDaniel residence.

In sum, the attached RSG memo demonstrates that given the distance of the residence, the intervening topography, and the estimated levels, there is not a "reasonable possibility" (as that term is used in the Protocol) that the Project sound level is within 5 dBA of the CPG exterior noise limit at the McDaniel residence. And the corollary is that the Project is in compliance with the exterior noise limits and no site-specific testing at the residence is required.

Project operations

GMCW has reviewed operational data for the period in question – August 13th to August 24th – to determine whether any "abnormal" project operations or maintenance occurred that could have generated noise in excess of the CPG limit or that in any event gave rise to the McDaniel complaint. See section 3.6 of the Sound Protocol. The operational data (SCADA and MET tower data) indicates that no abnormal operation or maintenance activities occurred during this period. No malfunctioning equipment or higher than average wind speeds were noted during that period. To the contrary, for the week of August 18th thru August 24th, the "worst of the noise problem" as indicated in the complaint, wind speeds and turbine operations were relatively low, as shown below:

Date	Daily Average Wind Speed (m/s)	Daily Average Turbine Blade RPM (max 14 RPM)
8/18	5.9	6.7
8/19	2.5	1.2
8/20	4.7	7.2
8/21	6.1	10.9
8/22	4.7	8.8
8/23	4.0	3.1
8/24	3.3	2.7

In the telephone conversation with Ms McDaniel, GMCW conveyed that in Vermont, August is typically one of the lowest if not the lowest month for wind speeds and therefore generally a very low operational month. During times of low wind speed, turbine blades rotate slower, less energy is produced, and much lower (if recordable) sound levels occur. The turbines do not reach their maximum sound level output until 14 RPMs.

[3] See Section 3. of the Protocol. Extrapolated sound levels that are within 5 dBA of the exterior noise limit would qualify a complainant for site-specific testing. 40 dBA is thus the level that would trigger this requirement.

Conclusion

The Project is not causing noise levels at the McDaniel residence that would trigger site-specific testing under the Monitoring Protocol, nor is the CPG noise limit being exceeded. No further action should be required.

GMCW wishes to respectfully note to the Board that it believes the complaint resolution process should in the first instance occur between GMCW and the complainant before being elevated to the Board, as is clearly contemplated in the Sound Protocol (see section 3.4). In this instance, Ms. McDaniel indicated she had a log of occurrences that she agreed to provide GMCW so that it could further investigate. Instead, the complaint was prematurely filed with the Board the next day, resulting in GMCW, the Board, and other agencies unnecessarily expending significant time and resources.

Thank you for your attention to this matter, and please do not hesitate to contact me should you have any questions.

Sincerely,

Andrew Raubvogel
Dunkiel Saunders Elliott Raubvogel & Hand, PLLC

cc: Service List

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7508

Petition of Georgia Mountain Community Wind, LLC,	)
for a Certificate of Public Good, pursuant to 30 V.S.A.	)
Section 248, authorizing the construction and operation	)
of a 5-wind turbine electric generation facility, with	)
associated electric and interconnection facilities, on	)
Georgia Mountain in the Towns of Milton and Georgia,	)
Vermont, to be known as the "Georgia Mountain	)
Community Wind Project"	)

CERTIFICATE OF SERVICE

I, Gillian Bergeron, certify that on September 19, 2014, I forwarded copies of Georgia Mountain Community Wind, LLC's *Letter to the Board Replying to McDaniel Complaint* by the method noted in the attached service list:

By Hand Delivery and Email

Mrs. Susan Hudson, Clerk
Vermont Public Service Board
112 State Street, Drawer 20
Montpelier, VT 05620-2701

By First Class Mail

Aaron Kisicki, Esq.
Vermont Department of Public Service
112 State Street, Drawer 20
Montpelier, VT 05620-2601

Dr. William E. Irwin
Vermont Department of Health
108 Cherry Street
Burlington, VT 05401

Judith Dillon, Esq.
Vermont Agency of Natural Resources
103 South Main Street, Center Building
Waterbury, VT 05671-0301

Barbara McDaniel
100 Reynolds Road
Milton, VT 05468

Dated at Burlington, Vermont, this 19th day of September, 2014.

By: _____
Gillian Bergeron
Paralegal

MEMO

TO: Georgia Mountain Community Wind, LLC, Martha Staskus, Proj. Mgr.

FROM: Ken Kaliski, P.E., INCE Bd. Cert.

DATE: September 18, 2014

SUBJECT: McDaniel Complaint

Thank you for forwarding to me the August 29, 2014 complaint of Barbara McDaniel of 100 Reynolds Road in Milton.

At your request, I reviewed the complaint in terms of the January 2012 Public Service Board-approved Georgia Mountain Community Wind (GMCW) "Post-construction sound monitoring protocol" and for the following reasons find that the complainant residence does not qualify for further investigation under the sound monitoring protocol. The relevant portions of the complaint resolution protocol are copied below in italics and our comments are below each quoted part:

> *1) GMCW will investigate as described below if the complaint represents a permanent residence within 1.5 km (0.9 miles) of the turbine string, and, based on monitoring and/or modeling, there appears a reasonable possibility that the Project sound level is within 5 dBA of the CPG exterior noise limit at the complaint location, and not related to abnormal Project operation or maintenance.*

The complainant property is 3.5 km (2.2 miles) from the project and thus does not meet the requirements for further investigation under the sound monitoring protocol noted above (see map on page 3). Nonetheless, we offer the following additional information relevant to this property.

First, the CADNA/A modeling done for the Section 248 review process, which accounted for topography, ground effects, atmospheric absorption, and other attenuating factors, indicates the anticipated sound level of the project is approximately 17 dBA at 100 Reynolds Road. The exterior noise limit under the CPG is 45 dBA. Given the initial modelled result of 17 dBA and the distance of the residence, there is not a reasonable possibility that the Project sound level at the McDaniel residence would be at least 40 dBA (the CPG limit of 45 dBA minus 5 dBA). Here again, the complainant residence does not qualify for further investigation under the sound monitoring protocol noted above.

Second, even if the residence did qualify for further investigation, the extrapolation methodology still does not yield a result of 40 dBA or greater, and thus site-specific testing is not required. This is based upon the following:

> *a. The A-weighted sound level from the closest monitoring location shall be extrapolated to the complaint location by means of the following formula to determine whether the sound level there is likely to be within 5 dBA of the exterior sound limit:*
>
> *Lpc = Lpm + 20 log (Dm/Dc), in dBA*
>
> *Where*
>
> *Lpc = Estimated sound level at the complainant location*
>
> *Lpm = Sound pressure level determined at the nearest monitoring location*
>
> *Dm = Distance from the turbine string to the relevant monitoring location*
>
> *Dc = Distance from the turbine string to the complainant location*

Using this formula, Lpc = 40 + 20 $\log_{10}$(1,458 m/3,556 m) = 32 dBA (40 dBA is the highest monitored sound level at the South monitor.) 32 dBA is less than the 40 dBA required for site-specific testing. It should be noted that this extrapolation formula results in higher sound levels than the CADNA model, because it does not take into account attenuation due to the hill between the project and the complainant, nor does it take into account ground and atmospheric attenuation.

> *b. If the extrapolated sound level is not within 5 dB of the exterior sound limit, then the wind farm operator will respond to the complainant, but is not required to conduct additional sound testing. Similarly, if the complaint is a result of abnormal operation, the operator will respond to the complainant and make necessary repairs, but will not be required to conduct sound testing.*

The exterior noise limit is 45 dBA. The project level using the above formula is not greater than 40 dBA (the exterior limit minus 5 dB).

> *c. If, on the other hand, the sound level is within 5 dB of the exterior sound limit, then GMCW will offer the homeowner testing to determine the attenuation value of the affected structure. If the offer is accepted, testing will be conducted using the ASTM E966-10 standard, 10, Standard Guide for Field Measurement of Airborne Sound Insulation of Building Facades and Façade Elements (2010). If no such request is made, a 15 dB value will be used.*

> *2) Sound monitoring will be conducted if (a) the sound level is within 5 dB of the exterior sound limit (based on the initial screening described above) and the attenuation value of the structure (based on the outside-to-inside test) does not exceed 12 dB, or (b) the sound level is within 3 dB of the exterior sound limit (based on the initial screening described above).*

Based on the above calculations, there is a substantial difference between the modeled/extrapolated sound levels at the 100 Reynolds Road residence and the CPG noise limit. As a result, GMCW is not required to conduct ASTM E966-10 tests for outside to inside transmission loss or sound monitoring under the complaint resolution protocol.

You also asked us to address whether infrasound from the wind turbines could be the cause of Ms. McDaniel's complaints. For infrasound to be audible, it would be at such a level to cause clearly perceptible vibration and rattle of the lightweight wall and ceiling constructions in the home.[1] This vibration and rattle will occur well before the hearing threshold. Infrasound from modern wind turbines has not been shown to be audible or perceptible, even at distances within a few hundred meters from a wind turbine.

What Ms. McDaniel describes as perceivable infrasound is more likely to be low frequency sound. Our CADNA/A model indicated low frequency sound at the 31.5 Hz octave band (which covers the frequency range of 22.4 Hz to 44.7 Hz) to be 36 dBZ, compared with the hearing threshold of 70 dBZ (Watanabe and Moeller (1990)). With the modeled level 34 dB below the hearing threshold, it would be unlikely that the source of any sound in the 31.5 Hz octave band frequency range would be from the wind turbines. At least moderately perceptible vibration and rattle of the house would be expected before perceiving sound at this frequency.

[1] The ANSI S12.2 standard for moderately and clearly perceptible vibration and rattle likely is 65 dBZ and 75 dBZ, respectively, at the infrasonic frequency of 16 Hz. In comparison, the hearing threshold at the 16 Hz octave band is approximately 93 dBZ (Watanabe and Moeller (1990).

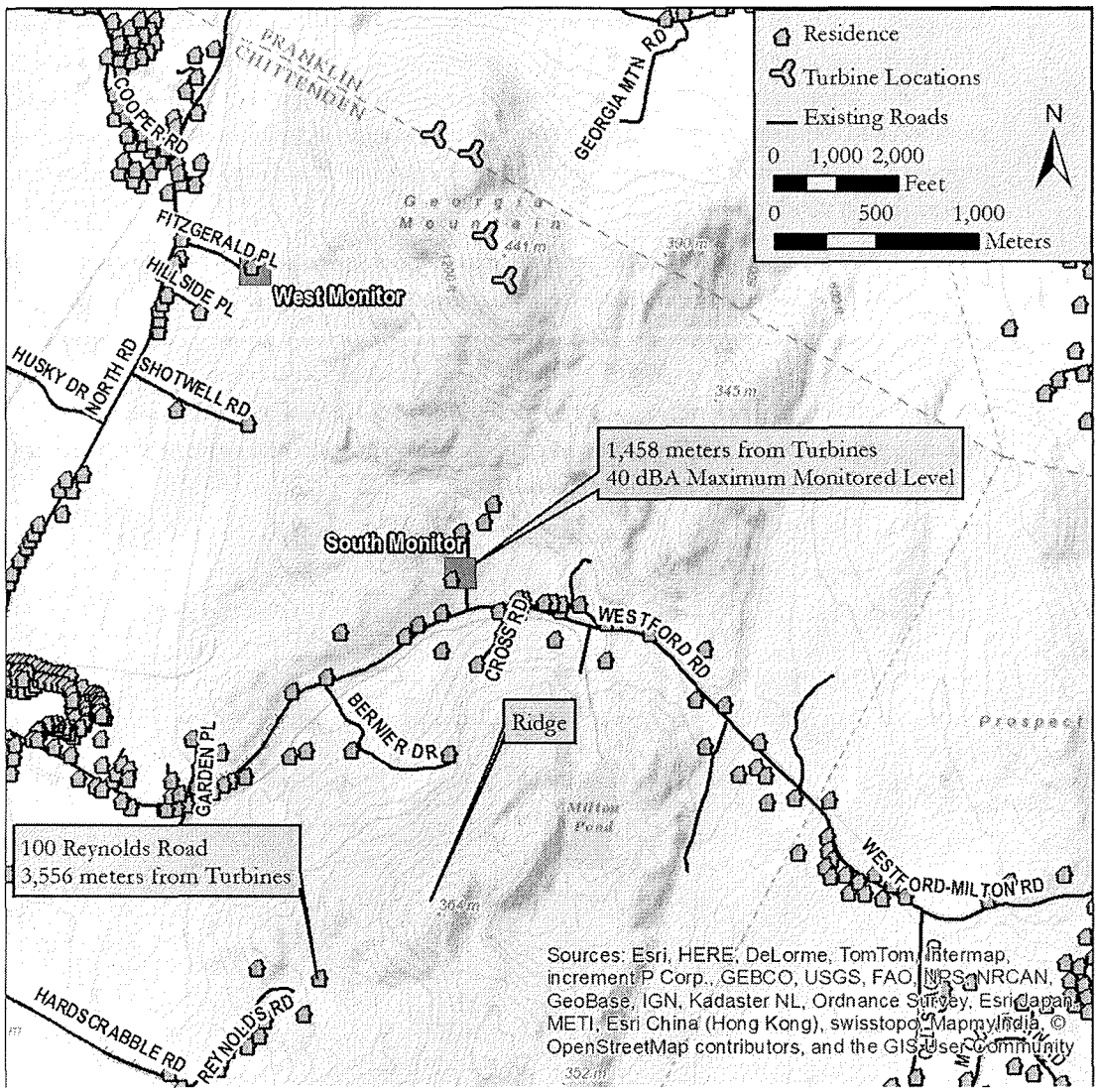

FIGURE 1: COMPLAINANT LOCATION