

July 9, 2018

Mr. James R. Beyer
Regional Licensing and Compliance Manager
Division of Land Resources – Eastern Maine Regional Office
Maine DEP
106 Hogan Road, Suite 6
Bangor, ME 04401

Re: Independent Peer Review of the Sound Assessment for NECEC

Dear Jim:

Tech Environmental, Inc. (TE) has completed an independent peer review of the acoustic impacts of the New England Clean Energy Connect (NECEC) electric transmission line, which will run from the border with Quebec in Beattie Township to a new converter station in Lewiston. The project includes two new substations, in Lewiston and Pownal, as well as equipment upgrades at three existing substations in Lewiston, Windsor and Cumberland. The new 345-kV, AC and 320-kV, DC transmission lines will total 147 miles in length.

The documents I received for this review are:

- Burns & McDonnell, Section 5.0 of the NECEC SLOD Application, “Noise,” 2017.
- NECEC, Response to the November 20, 2017 and December 12, 2017 MDEP Information Requests, March 29, 2018.
- Burns & McDonnell, “Raven Farm Substation Sound Study, Cumberland, Maine,” May 17, 2018.
- Burns & McDonnell, Response to the June 13, 2018 Tech Environmental, Inc. Data Requests, July 3, 2018.

Review Standard and Sound Sources

The purpose of this peer review is to determine if the acoustic studies submitted with the Application are reasonable and technically correct according to standard engineering practices, and whether adequate information is provided to enable the Department to draw conclusions about compliance of the NECEC with the Maine Noise Regulations.

The project will have two types of sound sources: (1) Transmission line corona discharge noise, which is loudest under wet weather conditions; and (2) Substation equipment noise, which occurs continuously day and night. These two sources are analyzed separately in the sections below.

Local Noise Standards

Section 5.2.3 of the SLOD Application states:

“Several municipalities that the NECEC Project passes through have their own noise regulations. The local regulations would be applied by MDEP in lieu of the MDEP noise regulation in each municipality, provided the local regulation meet[s] the requirements of MDEP Chapter 375.10(B)(1). The municipalities with local regulation are Lewiston, Greene, Leeds, New Sharon and Pownal.”

MDEP Chapter 375.10(B)(1) states:

“When a proposed development is located in a municipality which has duly enacted by ordinance an applicable quantifiable noise standard, which (1) contains limits that are not higher than the sound level limits contained in this regulation by more than 5 dBA, and (2) limits or addresses the various types of noises contained in this regulation or all the types of noises generated by the development, that local standard, rather than this regulation, shall be applied by the Board within that municipality for each of the types of sounds the ordinance regulates.”

Burns & McDonnell’s Response to our questions about the local ordinances states that since the local standards are not more than 5 dBA higher than the MDEP noise regulations, the local municipal standards apply in the Towns listed above. Citing an opinion from the Project’s counsel, Pierce Atwood, Burns & McDonnell concludes tonal noise does not factor into this consideration because it is not a “type of noise, rather, is a quality of noise.” These statements are provided for the Department in their consideration of the noise modeling results.

Transmission Line Noise Assessment

The Application states the Bonneville Power Administration (BPA) Corona and Field Effects Program was used to calculate expected audible transmission line noise under foul-weather/wet-conductor conditions. A wet weather sound level of 41 dBA is predicted at a distance of 75 feet from the center of the 345-kV, AC line, and that broadband sound level is consistent with verified modeling done for a similar 345-kV, AC generator line on the Number 9 Wind Project in Aroostook County.¹ In Burns & McDonnell’s Response, additional information was provided about the modeling assumptions and the amplitude of tonal noise. The additional information confirms that under worst-case wet weather conditions, non-tonal corona discharge noise dominates the constant low-level tonal noise and thus the maximum predicted sound level of 41 dBA at the transmission corridor ROW edge is not tonal in character. The transmission line sound assessment is technically correct and complete.

¹ Tech Environmental, Inc., “Independent Peer Review of the Sound Assessment for the Number Nine Wind Project – Revised,” March 8, 2016.

Substation Noise Assessments

Each of the five substations are discussed in a separate section below.

Merrill Road Substation – Lewiston

At the new Merrill Road Substation in Lewiston, sound sources will include four DC-to-AC converter transformers, ten radiators and a building housing valves and reactors. Existing sound levels measured near the south property line establish that the site is not in a quiet area as defined in the Maine Noise Regulations. Acoustic modeling with CadnaA software (ground factor $G=0.5$) predicted sound levels at six property line receptors (Table 5-7) and for a decibel contour map (Figure 5.2.4). Sound source data are provided in the application, and the transformers used in the acoustic modeling are a low-noise design.

Burns & McDonnell's Response states the actual equipment selected for the Merrill Road Substation will have sound power levels no higher than those listed in the SLOD Application Table 5-8. The highest predicted sound level is 48.3 dBA at receptor PL-5. The sound limit in the City of Lewiston Ordinance is 50 dBA. The Merrill Road Substation sound assessment is technically correct and complete. We recommend any permit issued by the Department require that new equipment installed at the Merrill Road Substation meet the sound power limits listed in Table 5-8.

Larrabee Road Substation – Lewiston

For the modified Larrabee Road Substation in Lewiston, three new 600 MVA transformers will replace the one existing transformer. Existing sound levels measured north of the substation establish that the site is not in a quiet area as defined in the Maine Noise Regulations. Acoustic modeling with CadnaA software (ground factor $G=0.5$) predicted sound levels at seven property line receptors (Table 5-10) and for a decibel contour map (Figure 5.3.3). The Application states (page 5-16) that existing capacitors and reactors were incorporated into the model as sound sources.

The highest predicted sound level is 43.1 dBA at receptor PL-4. The sound limit in the City of Lewiston Ordinance is 50 dBA. The Larrabee Road Substation sound assessment is technically correct and complete. We recommend any permit issued by the Department require that new equipment installed at Larrabee Road Substation meet the sound power limits listed in the SLOD Application Table 5-11.

Fickett Road Substation - Pownal

At the new Fickett Road Substation in Pownal, sound sources for the new STATCOM include two transformers, six reactors, three capacitors, five dry coolers, and two HVAC system fans. Existing sound levels measured on the site establish that the site is a quiet area as defined in the Maine Noise Regulations. Acoustic modeling with CadnaA software (ground factor $G=0.5$) predicted sound levels at six property line receptors (Table 5-14) and for a decibel contour map (Figure 5.4.5).

Burns & McDonnell’s Response states the actual equipment selected for the Fickett Road Substation will have sound power levels no higher than those listed in the SLOD Application Table 5-15. The highest predicted sound level, without a tonal noise penalty, is 41.9 dBA at receptor PL-2. The sound limit in the Town of Pownal Ordinance is 45 dBA. The Fickett Road Substation sound assessment is technically correct and complete. We recommend any permit issued by the Department require that new equipment installed at Fickett Road Substation meet the sound power limits listed in the SLOD Application Table 5-15.

Coopers Mills Road Substation - Windsor

For the expanded Coopers Mills Road Substation in Windsor, two new STATCOMs will be installed, and the new sound sources for each include of two transformers, six reactors, three capacitors, five dry coolers, and two HVAC system fans. Existing sound levels measured on the site establish that the site is a quiet area as defined in the Maine Noise Regulations. Acoustic modeling with CadnaA software (ground factor G=0.5) predicted sound levels at three property line receptors (Table 5-18) and for a decibel contour map (Figure 5.5.5). Existing sound sources consisting of three transformers, three capacitor banks, and six reactors were included in the acoustic model.

The highest predicted sound level for the two new STATCOMs, with an added 5-dBA tonal noise penalty, is 45.8 dBA at receptor PL-3. The sound limit in the MDEP regulation is 45 dBA. The Application includes this conclusion (page 5-30):

“Installing two new STATCOMs with the equipment sound levels in the table below may exceed the MDEP noise standards without additional mitigation, if a pure tone is measured. It is unclear at this time whether the new equipment will introduce enough tonal noise to measure a tone offsite. Additional noise control measures will be implemented as needed to achieve compliance with the MDEP noise standards.”

In the subsequent Response to MDEP Information Requests, the Applicant presents updated acoustic modeling for four property line receptors, and the highest predicted sound level for the two new STATCOMs, with a tonal noise penalty added, is 47.6 dBA at receptor PL-4. The Response then presents a mitigation strategy involving two sound walls, a 20-foot tall wall next to the main transformer and a 10-foot wall next to the STATCOM cooling fans, to lower all predicted sound levels below 45.0 dBA assuming the new sources produce Tonal Sound and a 5-dBA penalty applies. The mitigated sound level at receptor PL-4 declines to 44.3 dBA with the addition of the two sound walls. The sound limit in the MDEP regulation is 45 dBA. The Response to MDEP Information Request #8 states:

“If subsequent modeling (using vendor-provided sound data on STATCOM equipment to be installed as part of the NECEC project) predicts that applicable MDEP sound level limits will be exceeded at any property lines, CMP will update its proposal to include sound walls. These walls would be designed to be mostly absorptive sound panels with standard sound reduction properties. Specific wall properties and dimensions will be determined during detailed design of the project.”

Earlier in the Response, the Applicant tells us that the updated acoustic modeling used “vendor-provided sound data” for STATCOM equipment, and the modeling results clearly show sound walls are necessary because the Applicant believes the new equipment will produce Tonal Sound at the property lines. Burns & McDonnell’s Response to our recent Data Request states:

“If required, the sound walls’ final design will be appropriate such that modeling will demonstrate compliance with the sound level limits at the property line.”

The Coopers Mills Road Substation sound assessment is technically correct and complete. We recommend any permit issued by the Department require: (1) that new equipment installed at Coopers Mills Road Substation meet the sound power limits listed in the SLOD Application Table 5-19; and (2) the installation of sound walls as described in the Response to the MDEP Information Requests with final design supported by additional acoustic modeling using vendor-supplied octave band sound power levels.

Raven Farm Substation - Cumberland

For the expanded Raven Farm Substation in Cumberland, a new 448 MVA transformer will be installed. Existing sound levels measured near the south property line establish that the site is not in a quiet area as defined in the Maine Noise Regulations. Acoustic modeling with CadnaA software predicted sound levels at six property line receptors (Table 5-21) and for a decibel contour map (Figure 5.6.3). The highest predicted sound level, with a 5-dBA tonal noise penalty, is 49.0 dBA at receptor PL-3.

The subsequent “Raven Farm Substation Sound Study” (May 17, 2018) presents different acoustic modeling results. In the most recent CadnaA modeling (ground factor $G=0.5$), the Applicant states the new transformer was assumed to have a lower sound power level than in the original analysis. The applicant states that the transformer will emit Tonal Sound, and thus application of the 5-dBA penalty to all modeling results is required. The highest predicted sound level, with an added 5-dBA penalty, is 44.6 dBA at receptor PL-1. The sound limit in the MDEP regulation is 50 dBA.

The Raven Farm Substation sound assessment is technically correct and complete. We recommend any permit issued by the Department require that the new transformer installed at Raven Farm Substation meet the sound source limit listed in the supplemental Raven Farm Substation Sound Study Table 6-1, namely a sound pressure level of 75 dBA at 6 feet.

Conclusion and Summary of Recommendations

The noise assessment for the NECEC Project is reasonable, technically correct and complete. We recommend any permit issued by the Department require that new equipment installed at the five substations meet the sound source limits listed in SLOD Application Tables 5-8, 5-11, 5-15 and 5-19, and the sound source limit listed in Raven Farm Substation Sound Study Table 6-1. We also recommend that any such permit require the installation of sound walls at the Coopers Mills Road Substation, as described in the Response to the MDEP Information Requests, with final design supported by additional acoustic modeling using vendor-supplied octave band sound power levels.

Thank you for the opportunity to provide this independent peer review of the NECEC application. Please call if you have any questions.

Sincerely yours,

TECH ENVIRONMENTAL, INC.



Michael T. Lannan, P.E.
President
4301/Letter Report July 9 2018

TECH ENVIRONMENTAL, INC.



Peter H. Guldberg, INCE, CCM
Senior Consultant