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July 24, 2024

Ms. Katelin Nickerson
Project Director
Flycatcher, LLC
Lower Falls Landing, 106 Lafayette Street
Yarmouth, ME 04096
Via email: katelin@flycatcherllc.com

Subject: Overview of the Sound Level Impact Assessment for the Proposed KCE CT 11 BESS Project in Granby, Connecticut

Dear Ms. Nickerson:

Key Capture Energy, LLC (KCE) is proposing to construct a battery energy storage system (BESS) located at 100 Salmon Brook Street, immediately east of Route 202 and south of Mill Pond Drive in the Town of Granby, Connecticut (the Project). Flycatcher, LLC (Flycatcher), retained to assist in the permitting of the Project, has retained Epsilon Associates, Inc. (Epsilon) to conduct a sound level impact assessment for the Project.

The assessment included sound level modeling of operational sound from the proposed BESS and an evaluation against the Connecticut Department of Energy and Environmental Protection (DEEP) regulatory standards, specifically CGS §22a-69. The Project is considered an industrial sound source (Class C). An overview of the regulations, the modeling, and the sound level evaluation is provided herein.

Regulatory Requirements

Sections 22a-69-1 to 22a-69-7 of the Regulations of Connecticut State Agencies contain requirements regarding the Control of Noise which have been adopted by the Department of Energy and Environmental Protection (DEEP). Key aspects of these requirements are summarized herein.

Sound level limits are specified based on the land use classification of the emitter and the receptor. Table 1 summarizes the broadband sound level limits for the various emitter and receptor combinations. Sound levels emitted above the values listed in the table would be considered “excessive noise”. The classifications are based on the actual use of a parcel as detailed by the Standard Land Use Classification Manual of Connecticut.

If continuous noise measured beyond the Noise Zone of the emitter contains a prominent discrete tone, the sound levels in Table 1 are to be reduced by 5 dBA. A prominent discrete tone is defined in the regulation as,

> *"the presence of acoustic energy concentrated in a narrow frequency range, including, but not limited to, an audible tone, which produces a one-third octave band sound pressure level greater than that of either adjacent one-third octave and which exceeds the arithmetic average of the two adjacent one-third octave band levels by an amount greater than shown below opposite the center of frequency for the one-third octave band containing the concentration of acoustical energy."*

The one-third octave band limits for the determination of prominent discrete tone are presented in Table 2.

The regulation also limits infrasonic and ultrasonic sound. According to the regulation, "No person shall emit beyond his/her property infrasonic or ultrasonic sound in excess of 100 dB at any time." Manufacturers do not typically supply sound data in these ranges to assess this criterion. Impulsive noise is limited to 80 dB peak sound pressure level during the nighttime in a Class A Noise Zone and to 100 dB peak sound pressure level at any time in any Noise Zone. BESS equipment sound is generally steady by nature, not impulsive.

Per the State of Connecticut, BESS projects are defined as an industrial emitter. To ensure compliance at all hours, the most restrictive nighttime limits of 66 dBA at commercial properties and 51 dBA at residential properties will be applied for evaluating Project sound levels at applicable locations. Epsilon is not aware of local noise regulations applicable to the Project.

Table 1 Connecticut Sound Level Limits Based on Land Use

Emitter	Receptor			
	Class C Noise Zone	**Class B Noise Zone**	**Class A Noise Zone - Day**	**Class A Noise Zone - Night**
Class C Noise Zone	70 dBA	66 dBA	61 dBA	51 dBA
Class B Noise Zone	62 dBA	62 dBA	55 dBA	45 dBA
Class A Noise Zone	62 dBA	55 dBA	55 dBA	45 dBA

Table 2 Determination of a Prominent Discrete Tone

One-Third Octave Band Center Frequency (Hz)	Arithmetic Average Limit (dB)
100	16
125	14
160	12
200	11
250	9
315	8
400	7
500	6
630	6
800	5
1000	4
1250	4
1600	4
2000	3
2500	3
3150	3
4000	3
5000	4
6300	4
8000	5
10000	6

Sound Level Analysis Summary

Modeling Methodology

The primary sources of sound from the BESS Project will be the battery containers, power conversion systems (PCS or inverter), and transformers. There are eight (8) CSI SolBank 3.0 containers, two (2) Power Electronics Gen3 inverters, and two (2) FP4200M 4.2-megavolt-ampere (MVA) transformers proposed for the Project. Sound power levels for the containers were calculated by Epsilon using sound pressure level data from the manufacturer and input to the model. Sound power levels for the PCS's were provided by the manufacturer for model input, and Epsilon estimated sound power levels of the transformers using methods outlined in the Electric Power Plant Environmental Noise Guide[1] and the

1 Bolt Beranek and Newman Inc. (1984). *Electric Power Plant Environmental Noise Guide* (2nd ed.). Edison Electric Institute.

transformer MVA rating. The model utilized a site layout dated July 11, 2024, and the locations of the modeled equipment overlaying aerial imagery are shown in Figure 1 attached to this letter.

Sound levels from the facility were predicted using the CadnaA noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. Elevation contours for the modeling domain were directly imported into CadnaA which allowed for consideration of terrain shielding where appropriate.

Epsilon used CadnaA, the proposed site layout, and the sound level data to predict "Project-only" sound levels. A modeling grid with a 10-meter spacing was calculated for the area surrounding the Project. The grid was modeled at a height of 1.5 meters above ground level to mimic the ears of a typical standing person. This modeling grid allowed for the creation of sound level isolines as shown in Figure 1. The figure also shows 13 discrete modeling receptor locations that represent the closest neighboring properties. The receptors were also modeled at a height of 1.5 meters and are identified as either residential or commercial in Table 3 that is provided in the next section.

Sound Level Evaluation

Table 3 presents an evaluation of broadband sound levels at each of the 13 modeling receptors. Because the BESS will be able to operate at any time of day, the more stringent, i.e., nighttime standards, have been evaluated. The nighttime broadband sound level standard from an industrial source (Class C) at a residential zone (Class A) is 51 dBA, and the standard at a commercial zone (Class B) is 66 dBA.

Modeled Project-only broadband L_{eq} sound levels, which range from 47 to 59 dBA, are provided in the table. A modeling uncertainty factor of 2 dBA is included in these results. The highest sound level from the Project at a receptor on a commercial property line is 59 dBA (R01 and R02), and the highest sound level at a residential receptor is 50 dBA (R10 and R12). As shown in the table, all predicted levels are below the Connecticut DEEP broadband sound standards for industrial sources. These standards of 66 dBA and 51 dBA for commercial properties and residential properties, respectively, are shown as sound level isolines in Figure 1 along with additional sound levels for reference. The modeling shows that there are no prominent discrete tones at any receptors upon a review of the one-third octave band results presented in Table 4. Therefore, and in summary, the Project meets the Connecticut DEEP regulatory standards with respect to noise.

Table 3 CT DEEP Evaluation of Broadband Sound Levels

ID	Receptor Type	Modeled Project-Only L_{eq} Sound Level (dBA)	CT DEEP Nighttime Standard for Industrial Source (dBA)	Meets CT DEEP Standard?
R01	Commercial	59	66	YES
R02	Commercial	59	66	YES
R03	Commercial	58	66	YES
R04	Commercial	55	66	YES
R05	Commercial	50	66	YES
R06	Commercial	50	66	YES
R07	Commercial	49	66	YES
R08	Commercial	55	66	YES
R09	Commercial	58	66	YES
R10	Residential	50	51	YES
R11	Residential	48	51	YES
R12	Residential	50	51	YES
R13	Residential	47	51	YES

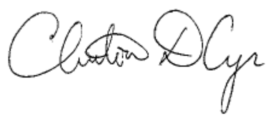
Table 4 One-Third Octave Band Sound Level Results by Receptor

One-Third Octave Band Center Frequency (Hz)	Modeled Project-Only One-Third Octave Band Sound Pressure Levels (dB) by Receptor												
	R01	R02	R03	R04	R05	R06	R07	R08	R09	R10	R11	R12	R13
100	51	52	51	48	45	45	44	48	52	44	43	43	42
125	51	53	52	49	45	45	44	49	53	43	42	42	42
160	54	55	54	52	49	49	48	52	55	48	47	47	45
200	46	48	47	46	40	40	39	42	51	39	37	38	37
250	46	48	47	46	40	40	39	43	51	38	37	38	37
315	47	49	48	47	41	41	40	44	52	40	39	40	38
400	46	49	47	46	41	41	40	45	50	40	38	39	37
500	50	51	49	48	43	43	42	46	51	42	40	41	39
630	47	47	46	44	39	39	38	43	48	38	36	38	36
800	48	48	46	44	41	40	40	45	47	40	38	39	37
1000	50	50	49	46	42	42	41	46	48	42	39	41	39
1250	50	50	49	46	41	41	40	46	49	42	39	41	39
1600	50	51	49	47	42	42	41	47	49	42	39	41	39
2000	48	48	47	44	39	38	38	45	47	39	36	39	37
2500	46	46	45	42	36	36	35	42	44	37	33	36	34
3150	44	44	43	40	34	33	32	40	42	34	30	33	31
4000	42	42	41	38	32	31	30	37	41	31	27	30	27
5000	38	40	38	35	27	27	25	34	38	27	22	25	21
6300	33	34	32	29	20	20	18	27	33	19	13	17	11
8000	25	27	25	22	10	9	7	18	27	9	1	5	0
10000	15	19	16	13	0	0	0	6	20	0	0	0	0

Conclusion

The predicted sound levels due to operation of the Project at each modeled location were compared to Connecticut DEEP noise regulations. Based on the results of the modeling, future sound levels from the Project are predicted to be below the Connecticut DEEP sound standards for industrial sources (Class C). Therefore, the Project meets the noise regulation at all property lines.

Sincerely,
EPSILON ASSOCIATES, Inc.



Clinton D. Cyr, PE, INCE Board Certified
Lead Engineer

Attachments:

Figure 1 Sound Level Modeling Results