**LODESTAR ENERGY**

NOISE EVALUATION

I. Introduction

To determine the acoustic impact of the proposed equipment, Petitioner first determined the property line sound pressure levels from the inverters. All proposed inverters are designed to be installed on a single 30x15' equipment pad at the NW edge of the array. The equipment pad's closest proximity to a property line is 320' to the Northern boundary as shown in Figure 1. In order to comply with Winchester Town Code, the inverter noise levels at the property line must comply with the residential requirements of Connecticut General Statutes chapter 442 section 22A-69-3.5.

Figure 1: Inverter location
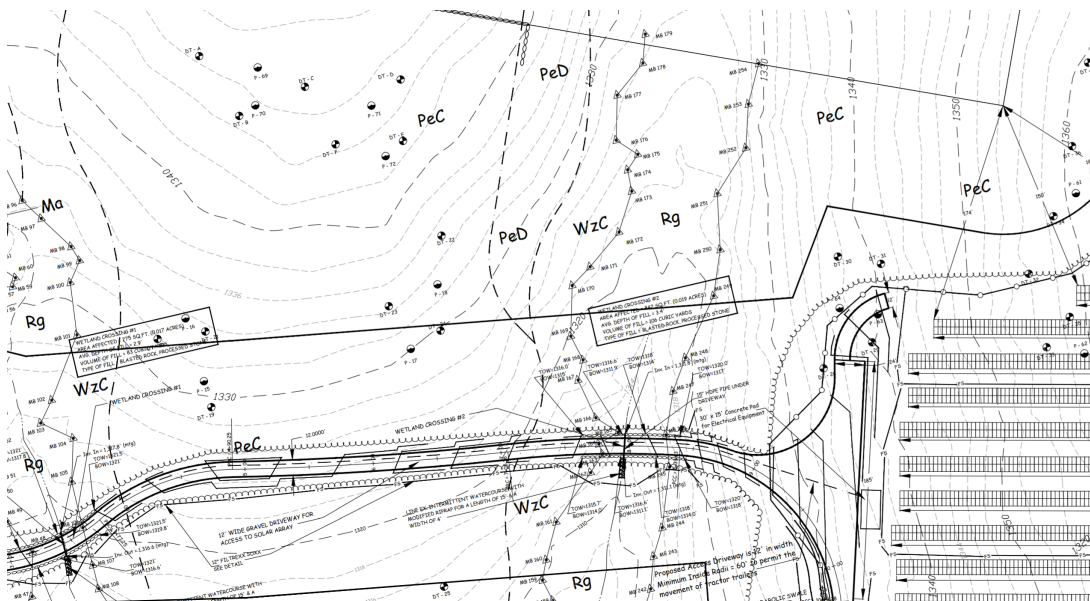
Table 1: Connecticut General Statutes chapter 442 section 22A-69-3.5

Sec. 22a-69-3.5. Noise zone standards

(a) No person in a Class C Noise Zone shall emit noise exceeding the levels stated herein and applicable to adjacent Noise Zones:

	Receptor			
	C	*B*	*A/Day*	*A/Night*
Class C Emitter	70 dBA	66 dBA	61 dBA	51 dBA
to				

Levels emitted in excess of the values listed above shall be considered excessive noise.

(b) No person in a Class B Noise Zone shall emit noise exceeding the levels stated herein and applicable to adjacent Noise Zones:
Receptor

	Receptor			
	C	*B*	*A/Day*	*A/Night*
Class B Emitter	62 dBA	62 dBA	55 dBA	45 dBA
to				

Levels emitted in excess of the values listed above shall be considered excessive noise.

(c) No person in a Class A Noise Zone shall emit noise exceeding the levels stated herein and applicable to adjacent Noise Zones:

	Receptor			
	C	*B*	*A/Day*	*A/Night*
Class C Emitter	62 dBA	55 dBA	55 dBA	45 dBA
to				

Levels emitted in excess of the values listed above shall be considered excessive noise.

(Effective June 15, 1978)

II.   Analysis

The proposed Project design includes the installation of (16) Sungrow SG125HV 125 kW inverters. According to the equipment specification sheet this unit has an acoustic noise output of 53.7 dBA at 1 meter (3.28 ft) from the unit. To quantify the reduction in sound from the point of origin to the closest property boundary (320 feet away), the formula utilizes the inverse square law for sound intensity. This formula states that the reduction in sound pressure is relative to the distance from the source. The formula is set forth below in equation 1 and applied to the instant case in which proposed site conditions are calculated:

$$Equation\ 1.\ DL\ =\ L_{P2} - L_{P1}$$

<u>Calculation</u>

$$DL = 10\log(R_2/R_1)^2$$
$$DL = 20\log(R_2/R_1)$$
$$DL = 20\log(320/3.28)$$
DL= 39.79 dBA
53.7 dBA − 39.79 dBA = 13.91 dBA

Variables:
DL = difference in sound pressure (dBA)
L_{P1} = Sound pressure level at location 1
L_{P2} = Sound pressure level at location 2
R_1 = distance from source to location 1
R_2 = distance from source to location 2

III.   Conclusion

In conclusion, taking into account the closest property line at 320' from the inverter pad (point of origin of noise emanation), the noise levels emitted from the inverters will be 13.91 dBA at the property line. Therefore, the proposed solar facility and its components comply with the Connecticut General Statutes chapter 442 section 22A-69-3.5.