

**Appendix 9**

**Noise Memorandum**

To: James Damon,  
Director of Development  
Hecate Energy

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Project: 185805178  
Chiquito BESS Noise Analysis

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## INTRODUCTION

This memo presents Stantec's method and comments resulting from exterior noise analysis from a proposed equipment installation at the Chiquito proposed BESS and substation site in the city of Wildomar, California as it relates to the neighboring property lines and noise-sensitive receptors around the project. All information contained in this memo is based on the July 8, 2021 Site and Foundation Plan drawing and sound pressure level information forwarded to Stantec as of April 8, 2022. Included below are sections addressing noise impact fundamentals and terminology, a description of the project location and conditions, a discussion of the project's design criteria, and the analysis conditions and results.

## NOISE IMPACT FUNDAMENTALS AND TERMINOLOGY

Noise is generally defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of a sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called A-weighting, written as dB(A) and referred to as A-weighted decibels. There is a strong correlation between A-weighted sound levels and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment.

For a point source, such as electrical equipment, sound attenuates at a rate of 6 dB per doubling of distance. For a line source, such as free-flowing traffic on a roadway, sound attenuates at a rate of 3 dB per doubling of distance (Federal Highway Administration 2011). Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. Barriers, such as solid fences, buildings, and topography that block the line of sight between a source and receptor, also increase the attenuation of sound over distance.

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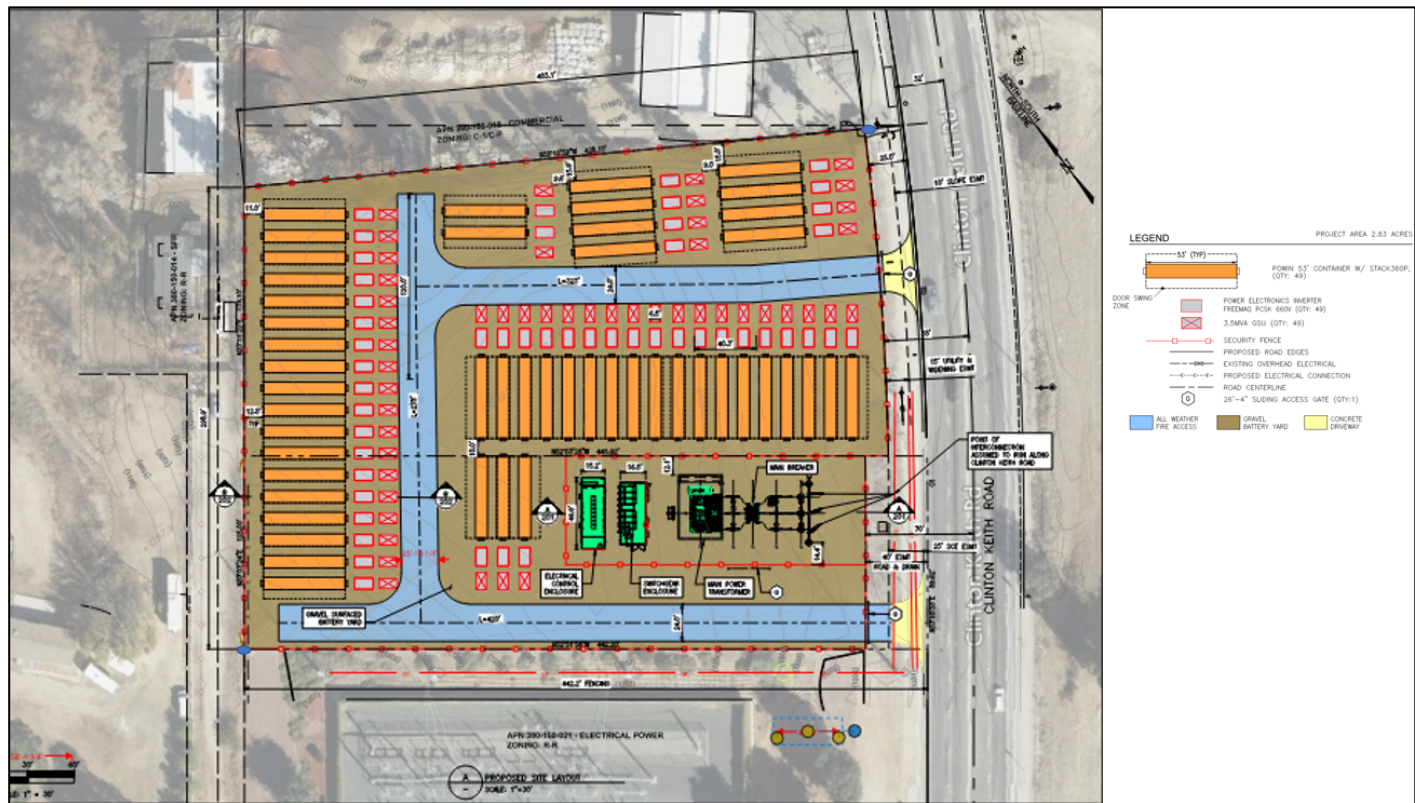
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Reference: Chiquito BESS Noise Analysis

## PROJECT LOCATION AND CONDITIONS

The proposed project would be located near the southwest edge of the city limits of Wildomar, California. The project site with the proposed equipment configuration, are shown in Figure 1. The adjacent properties, including property zoning, and the closest residential receptors, are shown in Figure 2. Much of the area is zoned "C-1/C-P" Commercial with two adjacent areas zoned "R-R" Rural Residential (north and west of the site). There are no noise-sensitive residential dwellings located directly adjacent to the location of the proposed equipment.

**Figure 1.** Location of the Chiquito Proposed BESS Site and Equipment Configuration.



Reference: Chiquito BESS Noise Analysis

Figure 2. Property Lines, Zoning, and Location of Noise-Sensitive Residential Receptors.



The proposed project will involve a total of forty-nine (49) battery modules with associated inverters (49 units) and GSUs (49 units). There also will be one (1) large transformer on the site. There are no sensitive residences directly adjacent to the project site. There is a landscaping business zoned as commercial property to the north and a vacant lot zoned commercial to the east of the project site. There is an existing public utility substation to the south (zoned rural residential) and an area zoned rural residential to the west that appears to be a non-occupied area. There will be a chain link fence surrounding the equipment on the Chiquito BESS site.

#### DESIGN CRITERIA

Title 9, Public Peace and Welfare, Chapter 9.48, Noise Regulations Table 1, “Sound Level Standards” –in the City of Wildomar Municipal Code<sup>1</sup> states the following:

*No person shall create any sound or allow the creation of any sound, on any property that causes the exterior sound levels on any other occupied property to exceed the sound level standards set forth in Table 1.*

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<sup>1</sup> <http://gcode.us/codes/wildomar/?view=desktop>, last accessed April 14, 2022.

Reference: Chiquito BESS Noise Analysis

<b>Table 1: Sound Level Standards (dBAmax)</b>			
<b>Noise Level Descriptor</b>	<b>Receiving Land Use Category</b>	<b>Daytime (7:00 a.m to 10:00 p.m.)</b>	<b>Nighttime (10:00 p.m. to 7:00 a.m.)</b>
<i>Maximum Level, dBA</i>	<i>RR-Rural Residence</i>	45	45
<i>Maximum Level, dBA</i>	<i>Commercial</i>	65	55

Section 9.48.050 “Sound level measurement methodology” states the following: *Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the enforcement officials identified in Section 9.48.080 of this chapter. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually. (Ord. 18 § 2, 2008, RCC § 9.52.050).*

**ANALYSIS CONDITIONS AND RESULTS**

The following conditions and assumptions were included in the exterior noise analysis:

- The predicted noise levels were calculated using the SoundPLAN acoustic modeling software. SoundPLAN uses standardized prediction techniques (per ISO 9613) and accounts for distance, topography, vegetation, and the effect of shielding and reflections produced by buildings and acoustic barriers.
- All receivers were positioned at 5’ above ground level.
- Transformer and inverter units were modeled as a point source.
- Battery modules were modeled as an area source.
- Overall Noise Data is presented in Appendix A. Where data was not provided, typical, generic equipment noise data was used based on the size and typical operating speeds of the equipment.
- All units were assumed to be operating at full capacity, continuously.
- Noise from the project site was analyzed to the adjacent properties.
- The proposed fence around the site was assumed to be a 6’ high open chain link fence with no acoustic properties.

Using the provided sound level data, the configuration of the equipment on-site shown in Figure 1, and the assumptions above, the modeled noise levels at the property lines are shown in the table below. The noise contour map is included in Figure 3 at the end of this memo.

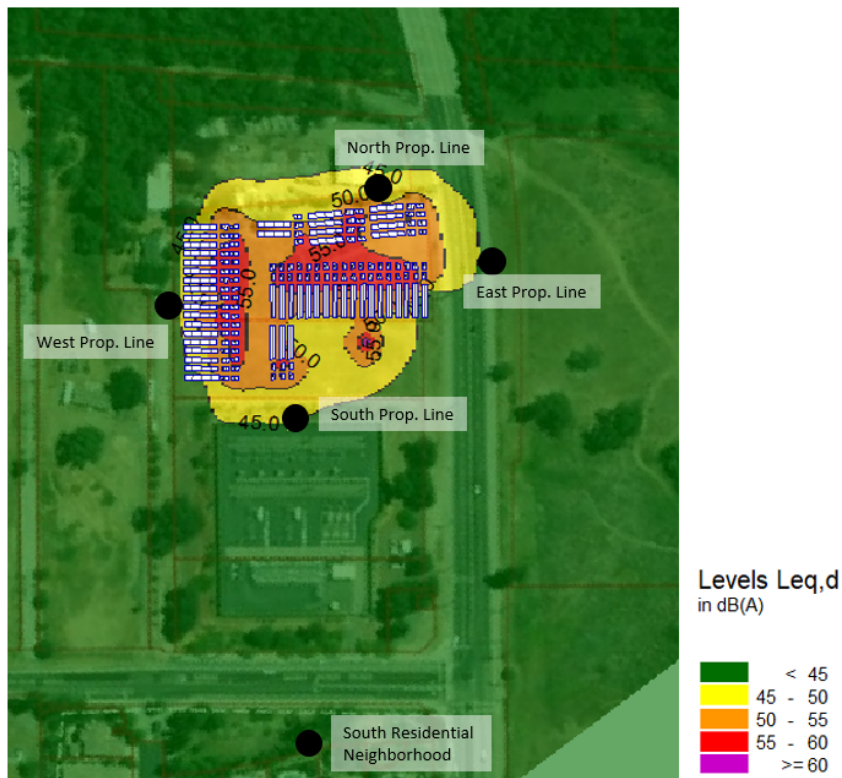
Reference: Chiquito BESS Noise Analysis

Property Locations	Predicted Sound Pressure Level SPL (dBA)	Maximum Sound Level Standard Day (Night)
Adj. North property line (27 ft) Shared with Commercial Zoned Property	47	65 (55)
Adj. South property line (75 ft) Shared with Rural Residential Zoned Property	45	45 (45)
Receiver South Residential Neighborhood (568 ft)	31	45 (45)
Adj. East property line (95 ft) Shared with Commercial Zoned Property	44	65 (55)
Adj. West property line (33 ft) Shared with Rural Residential Zoned Property	44	45 (45)

The estimated noise levels at the property lines and noise sensitive properties are not expected to exceed the City of Wildomar daytime and nighttime noise thresholds.

Figure 3. Noise Contour Map of the Chiquito BESS Site to Adjacent Property Lines

## Noise Contour Map



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**Reference: Chiquito BESS Noise Analysis**

This concludes Stantec's method and comments resulting from an analysis of exterior noise from a proposed equipment installation at the Chiquito BESS project site in Wildomar, California to the neighboring properties. Please do not hesitate to contact us with any questions or if further information is required.

**Stantec Consulting Services Inc.**



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### APPENDIX A: Equipment Sound Levels

Equipment	Overall Sound Power Level dBA	63	125	250	500	1000	2000	4000	8000	Notes
Transformer	80	73	73	73	73	73	73	73	73	Client provided Overall PWL; NEMH documentation
3.5 MVA GSU	62	55	55	55	55	55	55	55	55	Client provided Overall PWL; EATON chart
Inverter	<79*	72	72	72	72	72	72	72	72	Client provided SPL; Leaflet_Freemaq_PCSK_Multi_PCSK
Battery Module	70	69	69	69	65	62	60	62	65	Octave Band PWL Based on similar unit: OMAT Sutter BESS

\*Sound Pressure Level measured 1 m from back of unit