Appendix M

Noise Technical Memorandum

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TECHNICAL MEMORANDUM

To: RPCA Solar 15, LLC
From: Olivia Chan and Mayra Garcia, Kimley-Horn and Associates, Inc.
Date: October 30, 2024
Subject: Lear Avenue Solar Project – Noise Technical Memorandum

PURPOSE

The purpose of this technical memorandum is to evaluate potential short- and long-term noise and groundborne vibration impacts as a result of the Lear Avenue Solar Project (Project), located in unincorporated San Bernardino County (County), California.

PROJECT LOCATION

The Project would comprise 62 acres[1] of an 80-acre parcel (County Assessor Parcel Number [APN] 0612-131-01) generally located at the southeast corner of the intersection of Mesa Drive and Lear Avenue (Project Site). The Project Site is bordered by Mesa Drive to the north, Shoshone Valley Road to the east, Cove View Road to the south, and Lear Avenue to the west. Regional access to the Project Site is provided via State Route 62 (SR-62) to the south (see **Figure 1: Regional Vicinity map**). Local access to the Project Site would be accessed via Lear Avenue located west of and adjacent to the Project Site (see **Figure 2: Local Vicinity Map**).

PROJECT DESCRIPTION

RPCA Solar 15, LLC (Applicant) proposes to construct and operate a single-axis tracker ground-mounted photovoltaic (PV) community solar and battery energy storage system (BESS) with up to 9.9 megawatts of alternating current (MWac) in capacity. The Applicant is requesting a Conditional Use Permit (CUP) from the County. The Project would consist of the following components: solar modules, BESS, underground electrical conductors, Balance of System Equipment, access roads, and fencing. The Project would be interconnected to an existing electrical distribution system owned by Southern California Edison (SCE) located along the western Project Site boundary.

[1] The modeling completed for this analysis was done for a larger Project Site (71 acres). The Project has since been refined to be 62 acres. Therefore, the analysis provided herein is considered conservative.

Figure 1: REGIONAL VICINITY MAP

Lear Avenue Solar Project

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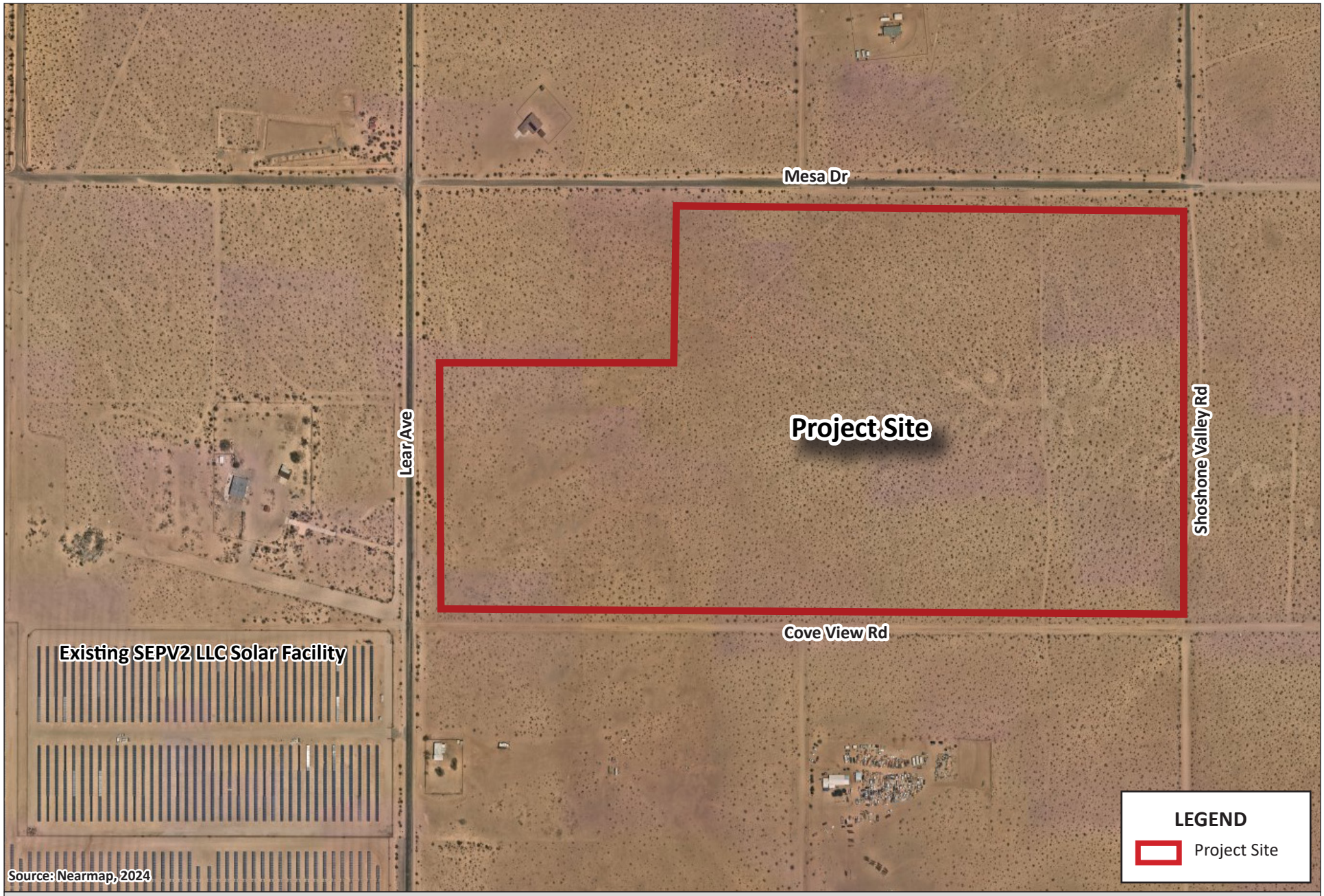

Figure 2: LOCAL VICINITY MAP
Lear Avenue Solar Project

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The Project would include solar modules and string inverters. The modules would be manufactured off-site and delivered by truck in wooden crates or cardboard boxes. The solar modules would be fully enclosed in metal and glass frames and would rotate throughout the day to maximize sun exposure. The frames of solar modules would be mounted on steel posts, which would be driven or screwed into the ground to a depth between 10 and 15 feet. The posts would be made from galvanized or corrosion-resistant metal to minimize the potential for corrosion over the lifespan of the Project. The foundations securing the solar modules would be designed to withstand high winds and snow loads. To protect equipment from potential ponding or overland stormwater flow, all equipment skids and pads would be elevated at a minimum of 12 inches above the 100-year flood elevation. The overall height of the solar array would be no more than 15 feet tall.

The BESS would store electrical energy produced by the Project during the day and flexible dispatch it to the grid when it is most needed, typically in the evening. The BESS would be comprised of six battery banks located in the southwest corner of the PV array. Each battery bank would be approximately the size of a standard shipping container. The BESS would include redundant safety measures, such as hydrogen detection, active ventilation, fire detection and remote shutdown, fireproof insulation, and internal fire suppression technology.

Underground electrical conductors would be installed in trenches at a depth in compliance with the National Electric Code. The conductors would be buried in either a polyvinylchloride (PVC) conduit or equivalent.

The Balance of System Equipment, including, but not limited to, inverters, AC combiner boxes, transformers, and/or medium voltage switchgear may be installed near the solar array within the Project's fence line. The Balance of System Equipment would be installed on H-Frames and concrete pads and in compliance with equipment manufacturer instructions. Low voltage conductors connecting the solar modules to the Balance of System Equipment would be run underground in conduit. The medium voltage conductors would mostly run underground in a similar fashion to low voltage wiring. A portion of the medium voltage conductor would ultimately come above ground and be strung along new distribution poles on the Project Site, ultimately terminating at the electrical distribution system along Lear Avenue, maintained by SCE.

Site access would be provided via a new driveway constructed from Lear Avenue. Where necessary, the access roads would be upgraded using gravel and geotextile fabric and extended into the Project's fence line. A perimeter access road would encircle the whole solar array. Additionally, two internal access roads would cross the entire width of the Project. The roads would be wide enough to accommodate emergency vehicles (20 feet wide and 15 feet wide for the perimeter and internal access roads, respectively) and designed in compliance with County building and fire department standards. Approximately 15 feet of space would be maintained between each row of solar modules for operations and maintenance access. The access roads would be placed such that the farthest panel is no further than 240 feet from the center of the fire road and would connect directly to the BESS.

The Project would be enclosed in a six-foot-tall chain link fence with one foot of barbed wire on top in compliance with the National Electric Code. The fence would have at least one vehicle access gate at the boundary of the array. The vehicle access gate would remain locked, except during operations and maintenance activities. A Knox box would be installed at the entrance gate to provide 24-hour access for emergency responders.

Construction

Project construction is anticipated to be completed over a period of approximately nine months, beginning as early as January 2025 and ending as early as October 2025. Project construction activities generally fall into three main categories: (1) demolition, (2) site preparation (vegetation clearing), (3) grading, (4) paving, (5) system installation, and (6) testing, commissioning, and cleanup.[2] The on-site construction workforce is expected to peak at approximately 50 individuals during the construction period. Construction personnel will be divided between civil and electrical services.

Operations

The Project would operate year-round. The Project would be unmanned, and no employees would report to the Project Site daily. Typical operations and maintenance (O&M) activities during Project operations include, but are not limited to, facility monitoring; administration and reporting; remote operations of inverters, BESS system, and other equipment; repair and maintenance of solar facilities; landscape maintenance; and periodic panel and inverter washing. It is estimated that the Project would require 6maintenance-related visits per year and up to 4 solar panel and inverter washing visits per year resulting in a total of 10 operational roundtrips per year (20 one-way trips).

During Project O&M, it is anticipated that minimal water would be required for solar panel and inverter washing. Water consumption for washing panels and inverters is expected to be approximately 0.2 acre-feet (AF) of water per year, and all water would be trucked in from an offsite source. Water washing is by deluge and no chemicals or other materials are used.

Decommissioning

At the end of the Project's operational term, the Applicant may determine that the Project should be decommissioned and deconstructed. The Applicant will work with the County to ensure decommissioning complies with all applicable local, State, and federal requirements and best management practices (BMPs). The Project would include BMPs to ensure the collection and recycling of modules and to avoid the potential for modules to be disposed of as municipal waste. Pursuant to San Bernardino County Development Code Section 84.29.070 (Decommissioning Requirements), following the operational life of the Project, the Project owner shall perform site closure activities to meet federal, State, and local requirements for the rehabilitation and revegetation of the Project Site after decommissioning.

[2] Note that the modeling does not account for testing, commissioning, and cleanup as heavy-duty construction equipment would not be utilized.

Equipment would be de-energized prior to removal, salvaged (where possible), placed in appropriate shipping containers, and secured in a truck transport trailer for shipment off site to be recycled or disposed of at an appropriately licensed disposal facility. Site infrastructure would be removed, including fences and concrete pads that may support the inverters and related equipment. The exterior fencing would be removed, and materials would be recycled to the extent feasible. Project internal and access roads would be restored to their pre-construction condition to the extent feasible unless the landowner elects to retain the improved roads for access throughout the property. A collection, reuse, and recycling program would be utilized to promote reuse and recycling of Project components and minimize disposal in landfills.

ACOUSTIC FUNDAMENTALS

Sound and Environmental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g., air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. In acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this ambient noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to virtually continuous noise from, for example, traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large and awkward range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold (20 micropascals) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness. **Table 1: Typical Noise Levels** provides typical noise levels.

Table 1: Typical Noise Levels		
Common Outdoor Activities	**Noise Level (dBA)**	**Common Indoor Activities**
	– 110 –	Rock Band
Jet fly-over at 1,000 feet		
	– 100 –	
Gas lawnmower at 3 feet		
	– 90 –	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	– 80 –	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	**– 70 –**	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	**– 60 –**	
		Large business office
Quiet urban daytime	**– 50 –**	Dishwasher in next room
Quiet urban nighttime	**– 40 –**	Theater, large conference room (background)
Quiet suburban nighttime		
	– 30 –	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	– 20 –	
		Broadcast/recording studio
	– 10 –	
Lowest threshold of human hearing	**– 0 –**	Lowest threshold of human hearing
Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.		

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) represents the continuous sound pressure level over the measurement period, while the day-night noise level (L_{dn}) and Community Noise Equivalent Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of an average level (L_{eq}) that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in **Table 2: Definitions of Acoustical Terms**.

Table 2: Definitions of Acoustical Terms	
Term	**Definitions**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.

Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports.

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA sound levels and the way the human ear perceives sound. For this reason, the dBA sound level has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the

standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound and twice as loud as a 60 dBA sound.[3] When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions.[4] Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics.[5] No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA.[6] The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by weighted average noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20

[3] Federal Highway Administration (FHWA), Noise Fundamentals, 2017, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed January 3, 2024.

[4] Ibid.

[5] California Department of Transportation (Caltrans), Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, page 2-29.

[6] James P. Cowan, Handbook of Environmental Acoustics, 1994.

dBA and quiet, suburban, residential streets with noise levels around 40 dBA.[7] Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in A-weighted noise levels (dBA), the following relationships should be noted[8]:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA is typically considered substantial.
- A 10 dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on People

Hearing Loss. While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.[9]

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[7] Compiled from James P. Cowan, Handbook of Environmental Acoustics, 1994 and Cyril M. Harris, Handbook of Noise Control, 1979.

[8] Compiled from California Department of Transportation, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013, and FHWA, Noise Fundamentals, 2017.

[9] Federal Interagency Committee on Noise, Federal Agency Review of Selected Airport Noise Analysis Issues, August 1992.

Groundborne Vibration

Sources of groundborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in **Table 3** should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Maximum PPV (in/sec)	Vibration Annoyance Potential Criteria	Vibration Damage Potential Threshold Criteria	FTA Vibration Damage Criteria
0.008	--	Extremely fragile historic buildings, ruins, ancient monuments	--
0.01	Barely Perceptible	--	--
0.04	Distinctly Perceptible	--	--
0.10	Strongly Perceptible	Fragile buildings	--
0.12	--	--	Buildings extremely susceptible to vibration damage
0.2	--	--	Non-engineered timber and masonry buildings
0.25	--	Historic and some old buildings	--

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations			
Maximum PPV (in/sec)	**Vibration Annoyance Potential Criteria**	**Vibration Damage Potential Threshold Criteria**	**FTA Vibration Damage Criteria**
0.3	--	Older residential structures	Engineered concrete and masonry (no plaster)
0.4	Severe	--	--
0.5	--	New residential structures, Modern industrial/commercial buildings	Reinforced-concrete, steel or timber (no plaster)
PPV = peak particle velocity; in/sec = inches per second; FTA = Federal Transit Administration			
Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual, 2020 and Federal Transit Administration, Transit Noise and Vibration Assessment Manual, 2018.			

EXISTING NOISE SETTING

Existing Stationary Noise Levels

The Project Site is located within a rural area. The primary sources of stationary noise in the Project vicinity are related to existing operations at the existing solar facility adjacent to the southwest of the Project Site. The noise associated with these sources may represent a single-event noise occurrence, short-term, or long-term/continuous noise.

Existing Ambient Noise Levels

To quantify existing ambient noise levels in the Project vicinity, Kimley-Horn conducted four noise measurements on October 19, 2023; refer to **Table 4: Noise Measurements** and **Figure 3: Noise Measurement Locations**. The noise measurement sites were representative of typical existing noise exposure within the Project vicinity. The ten-minute measurements were taken between 9:54 a.m. and 10:58 a.m. These short-term (L_{eq}) measurements are considered representative of the noise levels in the Project vicinity.

Table 4: Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Time
1	Southwest of the Project Site, along Lear Avenue and Cove View Road	69.7	24.9	82.8	98.6	9:54 a.m.
2	Northwest of the Project Site along Lear Avenue	72.7	26.1	87.9	103.4	10:18 a.m.
3	Northwest corner of the Project Site along Mesa Drive and Lear Ave.	69.5	27.1	84.6	102.6	10:37 a.m.
4	South of the Project Site along Cove View Road	40.5	23.5	56.9	75.80	10:58 a.m.
Source: Kimley-Horn and Associates, October 19, 2023 (refer to **Appendix A: Noise Data**).						

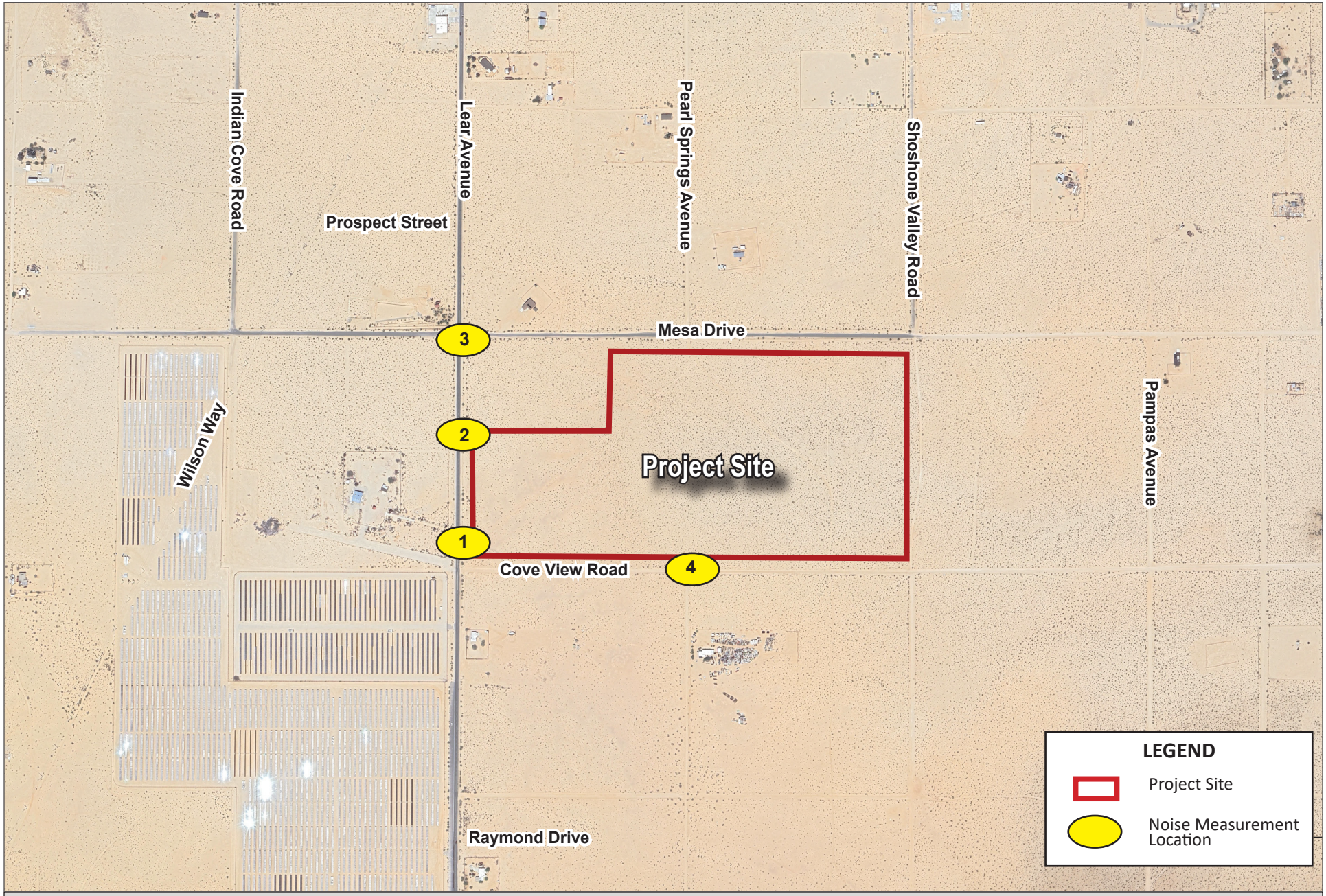

Figure 3: Noise Measurement Locations
Lear Avenue Solar Project

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Meteorological conditions consisted of clear skies, warm temperatures, with light wind speeds (0 to 5 miles per hour), and low humidity. Measured daytime noise levels ranged from 40.5 to 72.7 dBA L_{eq}. Noise monitoring equipment used for the ambient noise survey consisted of a Brüel & Kjær Hand-held Analyzer Type 2250 equipped with a Type 4189 pre-polarized microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters.

Noise Sensitive Receptors

Noise-sensitive land uses are generally considered to include single and multiple family residential areas, group homes, parks, and open space lands where quiet is a basis for use. Additional land uses such as schools, churches, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. The nearest sensitive receptor to the Project Site is a residential use located approximately 168 feet to the north of the Project Site; refer to **Figure 3**. The next sensitive receptor is a residential use located approximately 420 feet south from the Project Site.

REGULATORY FRAMEWORK

Federal

Occupational Safety and Health Administration (OSHA)

With the Occupational Safety and Health Act of 1970, Congress created OSHA to ensure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education, and assistance. The Act requires protection against the effects of noise exposure for employees when sound levels exceed 90 dBA over an eight-hour period. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment is required. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds an eight-hour time-weighted average sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

State

California Noise Control Act of 1973

California Health and Safety Code (HSC) Sections 46000 through 46080, known as the California Noise Control Act, find that excessive noise is a serious hazard to public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. The California Noise Control Act also finds that there is a continuous and increasing bombardment of noise in urban, suburban, and rural areas. The California Noise Control Act declares that the State has a responsibility to protect the health and welfare of its citizens through the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians that is free from noise that jeopardizes their health or welfare.

State Office of Planning and Research

The State Office of Planning and Research's *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The *Noise Element Guidelines* contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Local

San Bernardino County Countywide Plan / Policy Plan

The County's Countywide Plan, adopted on October 27, 2020, serves as a set of plans and tools for the County's unincorporated communities and complements the Countywide vision. The Countywide Plan consists of the Policy Plan, Business Plan, and Community Action Guides, together with the supporting environmental clearance. The Policy Plan is a component of the Countywide Plan that is an update and expansion of the County's General Plan for the unincorporated areas. The following goals and policies are applicable to the Project:

Hazards Element

Goal HZ-2: Human-Generated Hazards: People and the natural environment protected from exposure to hazardous materials, excessive noise, and other human-generated hazards.

Policy HZ-2.7. *Truck delivery areas.* We encourage truck delivery areas to be located away from residential properties and require associated noise impacts to be mitigated.

Policy HZ-2.9. *Control sound at the source.* We prioritize noise mitigation measures that control sound at the source before buffers, soundwalls, and other perimeter measures.

San Bernardino County Code of Ordinances

The San Bernardino County Code of Ordinances Section 83.01.080, *Noise*, establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses. The following sections of the Development Code are applicable to the Project.

§ 83.01.080 – Noise.

(c) Noise Standards for Stationary Noise Sources.

(1) Noise Standards. Table 83-2 (**Table 5: Noise Standards for Stationary Noise Sources**) *describes the noise standards for emanations from a stationary noise source, as it affects adjacent properties:*

Table 5: San Bernardino County Noise Standards for Stationary Noise Sources		
Affected Land Uses (*Receiving Noise)*	**7:00 a.m. – 10:00 p.m. L_{eq}**	**10:00 p.m. – 7 :00 a.m. L_{eq}**
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)
Notes: L_{eq} = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours. dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear. L_{dn} = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way L_{dn} takes into account the lower tolerance of people for noise during nighttime periods.		
Source: San Bernardino County Code of Ordinances, Section 83.01.080, Table 83-2.		

(2) Noise Limit Categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) Noise Standards for Adjacent Mobile Noise Sources. Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (**Table 6: Noise Standards for Adjacent Mobile Noise Sources**).

(e) Increases in Allowable Noise Levels. If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable

noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) Reductions in Allowable Noise Levels. If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (**Table 5**) *shall be reduced by five dB(A).*

(g) Exempt Noise. The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

Table 6: Noise Standards for Adjacent Mobile Noise Sources

Land Use		L_{dn} (or CNEL) dB(A)[4]	
Categories	**Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single and multi-family, duplex, mobile homes	45	60[3]
Commercial	Hotel, motel, transient housing	45	60[3]
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

1. The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.
2. The outdoor environment shall be limited to:
   - Hospital/office building patios
   - Hotel and motel recreation areas
   - Mobile home parks
   - Multi-family private patios or balconies
   - Park picnic areas
   - Private yard of single-family dwellings
   - School playgrounds
3. An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.
4. CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

Source: San Bernardino County Code of Ordinances, Section 83.01.080, Table 83-3.

§ 83.01.090 Vibration.

(a) Vibration Standard. No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces

a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line.

(b) Vibration Measurement. Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) Exempt Vibrations. The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

(2) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) THRESHOLDS

In accordance with Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project may have a significant adverse impact related to noise and vibration if one or more of the following would occur:

Threshold a): Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (refer to Impact NOI-1);

Threshold b): Generation of excessive groundborne vibration or groundborne noise levels (refer to Impact NOI-2); or

Threshold c): For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels (refer to Impact NOI-3).

IMPACT ANALYSIS

NOI-1 Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Construction Activities

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the nearest sensitive receptors in the vicinity of the construction site. The nearest sensitive receptor is a residential use located approximately 168 feet to the

north of the Project Site. It is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to the sensitive receptor.

Project construction is anticipated to be completed over a period of approximately nine months.[10] The Project involves construction activities associated with demolition, site preparation, grading, paving, and construction/installation, and PV Vendor trips. **Table 7: Typical Construction Noise Levels**, reflects maximum sound levels (L_{max}) that could be expected from the equipment-types listed at a reference distance of 50 feet from the noise source, which are the highest individual sound occurring at an individual time period. Operating cycles for the listed types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other sources of construction noise could include random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

Table 7: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source (L_{max})
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	80
Mounted Impact Hammer (hoe ram)	90
Paver	85
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Scraper	85
Shovel	82
Truck	84

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual, September 2018; Federal Highway Administration, Roadway Construction Noise Model User's Guide, January 2006.*

[10] Note that the modeling does not account for testing, commissioning, and cleanup as heavy-duty construction equipment would not be utilized.

The FHWA Roadway Construction Noise Model (RCNM) was used to calculate the worst-case construction noise levels at the nearest sensitive receptor in the vicinity of the Project Site during construction. The modeled receptor location represents the closest existing receiving land use to Project construction activities.

The noise levels calculated in **Table 8: Project Construction Noise Levels** show estimated noise levels for the worst-case construction noise scenario without accounting for attenuation from intervening barriers, structures, or topography. The nearest noise sensitive receptor (residential use) is located approximately 168 feet to the north of the Project Site. Following FTA methodology, when calculating construction noise, all equipment is assumed to operate at the center of the Project because equipment would operate throughout the Project Site and not at a fixed location for extended periods of time. Therefore, the distance used in the RCNM model for the Project Site was 1,242 feet for the nearest sensitive receptor (i.e., residential use) to the north of the Project Site.

Other receptors in the Project vicinity would be located further away and would experience lower construction noise levels than the closest receptor modeled. All construction equipment was assumed to operate simultaneously to represent a worst-case noise scenario as construction activities would routinely be spread throughout the construction site and would operate at different intervals.

Table 8: Project Construction Noise Levels

Construction Phase	Land Use	Receptor Location			Noise Threshold [2] (dBA L_{eq})	Exceeded?
		Direction	Distance (feet)	Worst Case Modeled Exterior Noise Level (dBA L_{eq})		
Demolition	Residential	North	1,242	58.5	80	**No**
Site Preparation	Residential	North	1,242	54.1	80	**No**
Grading	Residential	North	1,242	56.8	80	**No**
Construction/Installation	Residential	North	1,242	69.8	80	**No**
PV Panel Vendor Trips	Residential	North	1,242	52.1	80	**No**
Paving	Residential	North	1,242	45.1	80	**No**

1. Per the methodology described in the FTA Transit Noise and Vibration Impact Assessment Manual (September 2018), distances are measured from the nearby sensitive receptor property line to the center of the Project construction site.
2. The County does not have a quantitative noise threshold for construction and only limits the hours of the construction activities. Therefore, the FTA's residential construction noise threshold is conservatively used in this analysis (FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018).

Source: Federal Highway Administration, Roadway Construction Noise Model, 2006. Refer to **Appendix A** for noise modeling results.

San Bernardino County Code of Ordinances Section 83.01.080 exempts construction activities from the noise standard providing that such activities take place between the hours of 7:00 a.m. to 7:00 p.m. except Sundays and Federal holidays. Construction would primarily occur during daylight hours, Monday through Saturday, between 7:00 a.m. and 7:00 p.m., as required to meet the construction schedule. The San Bernardino County Code of Ordinances does not establish quantitative exterior construction noise

standards. While the San Bernardino County Code of Ordinances does not establish quantitative construction noise standards, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour L_{eq}) for residential uses to evaluate construction noise impacts at the nearest sensitive receptor.[11]

As depicted in **Table 8**, the closest sensitive receptor could be exposed to temporary and intermittent noise levels up to 69.8 dBA, which would not exceed the FTA's residential construction noise standard of 80 dBA L_{eq}. As previously noted, noise levels presented in **Table 8** are conservative, as these noise levels assume the simultaneous operation of all construction equipment at the same precise location. More likely, construction equipment would be used throughout the Project Site and would not be concentrated at one location within the Project Site. Therefore, impacts would be less than significant.

Construction Traffic

Construction activities would also cause increased noise along access routes to and from the Project Site due to movement of equipment and workers, as well as hauling trips. On-site soils are expected to balance, and no import or export of soils is anticipated. It is anticipated that construction worker trips would be a maximum of 40 total daily roundtrips, water truck trips would consist of a maximum of 11 daily roundtrips and vendor trips would consist of 2 daily roundtrips (PV vendor trips).[12,13] As a result, mobile source noise would increase along access routes to and from the Project Site during construction. However, mobile traffic noise from construction trips would be temporary and would cease upon completion of Project construction. While the San Bernardino County Code of Ordinances does not establish quantitative construction noise standards, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour L_{eq}) for residential uses to evaluate off-site construction traffic noise impacts along roadways adjacent to the Project Site.[14] A heavy-duty truck passing by a receptor is assumed to generate a noise level of 70 dBA at 50 feet.[15] Conservatively assuming that all 26 one-way truck trips would pass the same receptor within a 15-minute time period, noise levels along roadways would be approximately 64.7 dBA L_{eq}. This would not exceed the FTA's residential construction noise standard of 80 dBA L_{eq}. Further, San Bernardino County Code of Ordinances Section 83.01.080 exempts construction activities from the noise standard providing that such activities take place between the hours of 7:00 a.m. to 7:00 p.m. except Sundays and Federal holidays. Therefore, upon compliance with the FTA noise standard and compliance with the County's allowable construction hours, short-term noise impacts from construction traffic would be less than significant.

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[11] Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual, Table 7-2, September 2018, page 179.

[12] Worker trips are based on the peak construction workforce (70 individuals) with the San Bernardino County Occupancy rate for home-work applied (Source: Southern California Association of Governments, Year 2000 Post-Census Regional Travel Survey, Table 12, dated 2003.)

[13] Water truck trips and vendor trips (construction materials and PV panels) are based on similarly sized solar sites.

[14] Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual, Table 7-2, September 2018, page 179.

[15] University of Washington Department of Environmental and Occupational Health Sciences, Noise Navigator Sound Level Database, July 6, 2010.

Operations

Project O&M activities would include permanent and temporary noise sources associated with the solar PV systems, electrical collection lines, BESS, and maintenance activities.

Solar PV Systems

The solar PV arrays would include operation of single-axis tracking systems. Single-axis tracking systems employ a motor mechanism that would allow the arrays to track the path of the sun throughout the day. In the morning, the panels would face the east. Throughout the day, the panels would slowly move to the upright position at noon and on to the west at sundown. The panels would reset to the east in the evening or early morning to receive sunlight at sunrise. The Project would include solar modules which could operate simultaneously.

Noise from each tracker motor is approximately 40 dBA at 10 feet from the source.[16] During daylight hours, the tracking system motors would operate for a short period of time (normally two seconds) and pause for a longer period of time (about five minutes) before operating again. After sunset and before sunrise the next day, the array must reset to face easterly; this reset motion occurs once daily and takes approximately three minutes. The nearest sensitive noise receptor to any tracker would be the residential use located approximately 168 feet north of the Project Site. At this distance, noise levels associated with solar PV array tracker would be inaudible. Impacts would be less than significant.

Inverters and Transformers

Additional permanent noise sources from the Project Site would include small-scale inverters, AC combiner boxes, medium voltage transformers, and or medium voltage switchgear, and BESS. Small-scale inverters typically generate 65 dBA at 1 meter (3.28 feet)[17] and medium voltage transformers typically generate 63 dBA at 1 meter (3.28 feet).[18] As the nearest sensitive receptor could be located approximately 168 feet north from the Project Site boundary line, small-scale inverter and medium voltage transformer noise levels would be inaudible at the nearest sensitive receptor.

Electrical Collection Lines

The Project includes installation of underground electric collection lines. Therefore, noise levels associated with electrical collection lines would be inaudible at the nearest sensitive receptor, located approximately 168 feet north of the Project Site. Impacts would be less than significant.

[16] San Bernardino County, Desert Breeze Solar Project Draft Environmental Impact Report, September 2023, https://www.sbcounty.gov/uploads/LUS/Environmental/DESERT_BREEZE_SOLAR/_Desert%20Breeze%20Solar%20Project%20Draft%20EIR.pdf, accessed January 3, 2024.

[17] San Bernardino County, Desert Breeze Solar Project Draft Environmental Impact Report.

[18] National Electrical Manufacturers Association, *NEMA TR 1-2013 Transformers, Step Voltage Regulators and Reactors,* 2014.

Battery Energy Storage System (BESS)

The primary noise source associated with BESS operations would be the use of heating, ventilation, and air conditioning units (the BESS does not generate noise itself). The Project includes a BESS, which would require approximately multiple heating, ventilation, and air conditioning units to operate simultaneously. Based on standard HVAC units for other energy storage projects, a reference level of 51 dBA at a distance of 50 feet during full operation has been assumed.[19,20] The BESS would be located in the southwest area of the Project Site. Therefore, a distance of 354 feet, measured from the southwest corner of the Project Site to the nearest sensitive receptor property line to the south, was used for the used for the calculated BESS HVAC noise levels. At this distance, noise levels from the BESS heating, ventilation, and air conditioning units are estimated at approximately 34.0 dBA. Therefore, the Project would not exceed County daytime or nighttime noise standards of 55 dBA L_{eq} and 45 dBA L_{eq}, respectively. Impacts would be less than significant, and no mitigation is required.

Maintenance

Panel Washing Noise. The Project would require panel washing up to four times per year. Panel washing activities would not require power washing equipment and would consist of hand washing. Noise related to the water trucks is discussed below. Therefore, negligible noise levels from panel washing would result. Impacts would be less than significant.

Vehicular Noise. The Project would generate periodic operational vehicle trips internal to the Project Site for required maintenance activities that would not increase personnel daily trips external to the site when compared to existing conditions. Project maintenance activities would be minimal, with an estimated 6 maintenance-related visits per year and up to 4 solar panel and inverter washing visits per year. Therefore, the Project is expected to generate a total of approximately 10 operational roundtrips per year (20 one-way trips). These activities are not expected to occur on a daily basis and would not generate a significant amount of traffic or crate a substantial increase of vehicular noise in the area. Any increase in traffic would be minimal and sporadic and only occur during daytime hours. On a worst-case day, one maintenance truck and one water truck would travel to the Project Site at the same time. Assuming that two passenger vehicles, one medium-duty truck, and one heavy-duty truck would visit the Project Site at the same time, a noise level of 36.6 dBA would be generated at approximately 100 feet. This noise level would not exceed the County's daytime threshold of 55 dBA; therefore, impacts from vehicular noise would be less than significant.

Decommissioning

When the Project is decommissioned, equipment operation and site restoration activities would result in a temporary increase in ambient noise levels in the Project vicinity. Given the fact that much of the construction equipment necessary to construct the Project would also be required for Project decommissioning, it is reasonable to assume that noise generated from decommissioning activities would

[19] Kern County Planning and Natural Resources Department, *Acoustical Assessment for the AVEP Project*, August 5, 2020.
[20] The reference noise level has been adjusted to account for four HVAC units. See **Appendix A**.

be similar in nature to construction activities. Similar to the construction noise analysis above, Project decommissioning would potentially result in increased noise levels compared to existing conditions. It is assumed that decommissioning activities would be similar to construction activities. As discussed above, Project construction (and similarly, decommissioning) would not exceed the FTA's residential construction noise standard of 80 dBA L_{eq}. Further, the San Bernardino County Code of Ordinances Section 83.01.080 exempts construction activities from the noise standard providing that such activities take place between the hours of 7:00 a.m. to 7:00 p.m. except Sundays and Federal holidays. Therefore, upon compliance with the FTA noise standard and upon compliance with the County's allowable construction hours (Code of Ordinances Section 83.01.080), short-term noise impacts from decommissioning activities would be less than significant.

Impact Determination: Less Than Significant Impact with Mitigation Incorporated.

Mitigation Measures: No mitigation is required.

NOI-2 Would the Project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction

Project construction would include demolition, site preparation, grading, construction/installation, PV vendor trips, and paving (access road installation) and would not require blasting. While these construction activities would result in groundborne vibration, such groundborne vibration would attenuate rapidly from the source and would not generally be perceptible beyond the boundaries of the Project Site.

The FTA has published standard vibration velocities for construction equipment operations. The types of construction vibration impact include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. Caltrans and the FTA have identified various vibration damage criteria for different building classes. As the closest receptor is a residential use, this evaluation uses the FTA architectural damage criterion for continuous vibrations at non-engineered timber and masonry buildings of 0.2 in/sec PPV and the human annoyance criterion of 0.04 in/sec PPV; refer to **Table 3**. The vibration produced by construction equipment, is illustrated in **Table 9: Typical Vibration Levels for Common Construction Equipment**.

Table 9: Typical Vibration Levels for Common Construction Equipment

Equipment	Reference PPV at 25 feet (in/sec)	Approximate PPV at 168 feet (in/sec)[1]
Vibratory Compactor/Roller	0.210	0.012
Large bulldozer	0.089	0.005
Loaded trucks	0.076	0.004

Table 9: Typical Vibration Levels for Common Construction Equipment		
Small bulldozer	0.003	<0.001

Notes:

1. Calculated using the following formula:
   PPV equip = PPVref x $(25/D)^{1.5}$
   where: PPV (equip) = the peak particle velocity in inch-per-second of the equipment adjusted for the distance
   PPV (ref) = the reference vibration level in inch-per-second from Table 7-4 of the FTA Transit Noise and Vibration Impact Assessment Manual
   D = the distance from the equipment to the receiver

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.

Groundborne noise and vibration decreases rapidly with distance. As indicated in **Table 9**, based on the FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range <0.001 to 0.012 inch/sec PPV at 168 feet (measured from the Project Site to the nearest structure) north of the Project Site. At this distance, vibration velocities would be imperceptible (i.e., up to 0.012 in/sec PPV for a vibratory roller at the Project Site). Therefore, the 0.2 in/sec PPV architectural damage significance threshold and the 0.04 in/sec PPV human annoyance criteria would not be exceeded as a result of Project construction activities. Thus, no sources of groundborne vibration or groundborne noise would be expected to affect sensitive receptors in the Project vicinity, and there would not be any potential for excessive exposure of persons to or generation of groundborne vibration levels. Impacts would be less than significant.

Operations

The Project would have operation and maintenance components, such as heating, ventilation, and air conditioning systems for the BESS, maintenance vehicles, backup generator, small-scale inverters, and medium voltage transformers, that would not generate noticeable groundborne vibration levels. Project operations would not involve any sources capable of generating perceptible levels of vibration in the surrounding area. There would be no permanent source or potential to change vibration levels, except during unscheduled maintenance or repair activities, which would be similar to construction activities. According to the FTA, regular maintenance trucks generate vibration velocities of up to 0.076 in/sec PPV a distance of 25 feet (refer **Table 9**).[21] Pursuant to the San Bernardino County Code of Ordinances Section 83.01.090, groundborne vibration shall not exceed 0.2 in/sec PPV at the nearest property line within a residential, commercial, and industrial land use zoning district. Land use zoning districts surrounding the Project Site include Resource Conservation (RC) and Rural Living (RL), which allow residential uses.[22] Although residential land use zoning districts surround the Project Site, regular maintenance trucks would not generate groundborne vibration levels exceeding the County's 0.2 in/sec PPV vibration threshold at any structures located along roadways in the Project vicinity. As the nearest vibration-sensitive receptor is located approximately 168 feet north from the Project Site and approximately 138 feet from the nearest

[21] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018

[22] The RC (Resource Conservation) land use zoning district provides sites for open space and recreational activities, single-family homes on very large parcels and similar and compatible uses. The RL (Rural Living) land use zoning district provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses.

roadway, operational vibration levels at the nearest off-site receptors would be imperceptible. Thus, the County's 0.2 in/sec PPV vibration threshold would not be exceeded, and impacts would be less than significant.

Decommissioning

When the Project is decommissioned, equipment operation and site restoration activities could result in temporary vibration impacts at close distances. Given the fact that much of the construction equipment necessary to construct the Project would also be required for Project decommissioning, it is reasonable to assume that vibration generated from decommissioning activities would be similar in nature to construction activities. As with the construction activities described above, decommissioning activities would not be expected to generate groundborne noise that would affect sensitive receptors in the Project vicinity, and there would not be any potential for excessive exposure of persons to or generation of groundborne vibration levels. Impacts would be less than significant.

Impact Determination: Less Than Significant Impact.

Mitigation Measures: No mitigation is required.

NOI-3 For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

The nearest airport to the Project Site is the Twentynine Palms Airport located approximately 11 miles to southeast. The Project Site is not located within the vicinity of a private airstrip or related facilities. No impact would occur in this regard.

Impact Determination: No Impact.

Mitigation Measures: No mitigation is required.

CUMULATIVE IMPACTS

Construction Noise

The Project's construction activities would not result in a substantial temporary increase in ambient noise levels at the nearest sensitive receptors. Construction noise would be periodic and temporary noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction project noise impacts if construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant and would be required to comply with the San Bernardino County Code of Ordinances. The combination of the Project together with other related present and reasonably foreseeable future developments in the Project vicinity could involve actions with the potential to result in noise impacts. However, construction noise impacts for each cumulative project would be mitigated through compliance with the County's standards and ordinances, and any necessary mitigation measures identified through the County's development review process. Thus, construction noise impacts would not be cumulatively considerable, and impacts would be less than significant.

Operational Noise

Project operation would not result in a substantial permanent increase in ambient noise levels from on-site stationary or off-site mobile traffic noise sources. Similarly, cumulative projects in the Project vicinity would be subject to the development review process, which could include conditions of approval or mitigation measures, as necessary, to minimize the exposure of sensitive receptors and other receiving land uses to excessive noise to the furthest extent possible. Therefore, operational noise impacts would not be cumulatively considerable, and impacts would be less than significant.

Decommissioning Noise

Cumulative projects in the Project vicinity would likely be operational and contribute to the overall ambient noise and vibration conditions prior to Project decommissioning activities. Thus, temporary noise and vibration impacts from decommissioning activities associated with the Project would not likely combine with other cumulative projects in close proximity and at the same time. As noted above, it is reasonable to assume that noise and vibration generated from decommissioning activities would be similar in nature to construction activities, which would not exceed applicable thresholds and would result in less than significant impacts. Cumulative projects would be subject to County noise standards. Therefore, cumulative noise and vibration impacts during Project decommissioning activities would not be cumulatively considerable, and impacts would be less than significant.

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Appendix A

Noise Data

Noise Measurement Field Data

Project:	RPCA Lear Solar	**Job Number:**	
Site No.:	ST-1	**Date:**	10/19/2023
Analyst:	Moody	**Time:**	9:54 AM
Location:	Cars, traffic, insects		
Noise Sources:	File Ing. 083		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
69.7	24.9	82.8	98.6

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	82
Wind (mph):	4 <5
Sky:	Clear
Bar. Pressure:	29.98 inHg
Humidity:	20%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.083.s
File Name on PC	LxTse_0005586-20231019 095606-lng.083.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-10-19 09:56:06
Stop	2023-10-19 10:11:06
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-10-19 09:53:12
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	**C**	**Z**
Under Range Peak	**79.1**	76.1	81.1 dB
Under Range Limit	**25.3**	26.0	31.7 dB
Noise Floor	16.1	16.8	22.5 dB

	First	**Second**	**Third**
Instrument Identification	Kimley-Horn & Associates, Inc.	1100 W.Town & Country Rd, 700	714.939.1030

Results

LAeq	69.7 dB	
LAE	99.2 dB	
EA	933.254 µPa²h	
LApeak (max)	2023-10-19 10:01:00	98.6 dB
LASmax	2023-10-19 10:07:41	82.8 dB
LASmin	2023-10-19 10:06:23	24.9 dB
SEA	-99.9 dB	

	Exceedance Counts	**Duration**
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	69.7	69.7	-99.9	69.7	69.7	-99.9	-99.9	dB

LCeq	72.6 dB
LAeq	69.7 dB
LCeq - LAeq	2.9 dB
LAleq	73.0 dB
LAeq	69.7 dB
LAleq - LAeq	3.3 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	69.7		72.6			
LS(max)	82.8	2023/10/19 10:07:41				
LS(min)	24.9	2023/10/19 10:06:23				
LPeak(max)	98.6	2023/10/19 10:01:00				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	77.6 dB
LA 10.00	75.3 dB
LA 33.30	62.5 dB
LA 50.00	54.7 dB
LA 66.60	48.7 dB
LA 90.00	33.8 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**	**6.3**	**8.0**	**10.0**
Direct	2019-10-29 12:18:45	-28.39	2.58	5.73	0.93
PRMLxT1L	2023-10-19 09:53:09	-28.77	63.35	59.53	59.80
PRMLxT1L	2023-10-18 08:47:49	-28.76	60.66	66.81	57.10
PRMLxT1L	2023-10-10 09:33:58	-28.85	60.24	58.27	55.95
PRMLxT1L	2023-08-31 10:04:48	-28.76	61.03	61.98	57.52
PRMLxT1L	2023-08-14 09:21:22	-28.80	71.99	60.72	64.53
PRMLxT1L	2023-08-02 08:47:34	-28.78	52.32	54.78	54.24
PRMLxT1L	2023-08-02 08:45:53	-28.81	63.42	57.07	62.26
PRMLxT1L	2023-07-13 12:40:44	-28.75	66.48	69.97	55.31
PRMLxT1L	2023-07-13 09:51:44	-28.90	59.31	60.71	58.62
PRMLxT1L	2023-07-13 09:23:44	-28.90	60.41	60.71	59.50
PRMLxT1L	2023-06-27 08:29:08	-28.80	62.55	58.54	56.17

12.5	**16.0**	**20.0**	**25.0**	**31.5**	**40.0**	**50.0**	**63.0**	**80.0**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**6300**	**8000**	**10000**	**12500**	**16000**	**20000**
0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
60.05	59.26	51.90	50.02	52.03	48.84	46.55	50.54	47.61	46.89	46.07	45.77	45.37	39.84	35.92	36.51	38.46	31.89	29.71	113.97	49.24	18.70	66.40	18.70	58.20	18.79	27.05	21.17	22.20	23.65	25.46	27.63	30.59
46.30	57.17	55.11	55.89	53.05	53.68	53.49	49.95	48.72	51.85	50.42	45.92	44.31	43.65	44.93	48.98	39.89	33.44	29.04	114.07	49.09	18.68	66.54	19.32	58.34	19.83	27.38	21.02	22.40	23.99	25.67	27.85	30.51
51.16	53.85	49.38	57.60	52.63	59.92	61.16	59.63	57.88	61.60	61.48	60.16	55.35	54.35	50.96	52.97	51.43	38.31	38.40	113.89	48.91	25.20	66.07	19.31	58.70	19.97	27.63	21.27	22.26	23.67	25.43	27.73	30.42
60.54	55.29	55.45	52.03	56.13	51.43	52.86	50.08	46.64	44.05	42.29	40.24	37.71	31.00	27.38	25.45	24.01	16.34	28.63	114.03	49.13	18.74	66.81	19.33	58.08	19.61	27.07	21.34	22.67	24.08	25.72	28.04	30.76
70.08	63.71	67.13	60.17	57.01	58.38	57.73	57.84	53.97	43.98	41.61	39.62	31.13	30.71	31.16	26.66	22.48	18.46	28.88	113.96	49.06	19.58	66.31	19.22	58.61	19.98	27.20	21.45	22.57	24.00	25.60	27.84	30.65
61.95	67.23	63.90	60.11	66.50	67.18	65.63	67.81	58.63	62.44	62.97	59.45	56.82	56.57	49.11	41.87	44.95	39.11	31.91	114.01	49.20	19.78	66.22	20.13	58.78	19.78	27.29	21.19	22.83	23.65	25.47	27.96	30.70
59.06	64.40	63.93	61.00	59.31	57.80	60.57	63.65	73.88	60.21	63.97	56.12	59.45	55.95	51.94	48.19	48.57	41.68	32.21	113.92	49.05	20.13	66.18	19.50	58.69	19.68	27.63	21.29	22.46	23.81	25.75	27.85	30.58
57.78	62.25	60.41	52.04	59.64	56.55	53.66	55.01	52.17	53.95	53.05	57.87	52.77	50.89	49.51	49.22	47.27	41.20	32.67	114.13	49.64	22.14	66.59	19.40	59.22	19.80	28.04	21.49	22.96	24.29	26.12	28.35	30.63
58.55	59.70	61.21	55.40	52.93	54.87	52.65	50.34	53.26	56.31	49.85	55.07	47.59	42.80	42.90	36.42	37.06	30.68	29.45	113.98	49.32	18.75	66.17	19.46	59.00	19.93	27.68	21.66	22.12	23.76	25.78	27.67	30.87
63.74	60.22	56.73	57.65	53.07	53.21	54.90	55.01	51.50	56.50	51.18	46.63	44.37	45.45	40.66	36.44	31.18	28.12	28.93	113.89	49.22	20.28	65.88	19.60	58.94	19.28	27.57	21.28	22.65	23.74	25.74	27.87	30.71
61.21	48.58	46.35	57.62	53.72	60.54	57.94	56.79	54.45	51.06	47.79	42.98	39.91	36.82	39.43	37.83	26.63	25.08	29.05	114.00	48.90	19.00	66.00	19.76	58.87	20.08	27.50	21.16	22.32	23.59	25.56	28.00	30.62

Noise Measurement Field Data

Project:	RPCA Lear Solar	**Job Number:**	
Site No.:	ST-2	**Date:**	10/19/2023
Analyst:	Moody	**Time:**	10:18 AM
Location:			
Noise Sources:	Traffic, cars, insects		
Comments:	**File ING.084**		

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
72.7	26.1	87.9	103.4

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	83
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.97 inHg
Humidity:	19%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.084.s
File Name on PC	LxTse_0005586-20231019 101842-lng.084.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-10-19 10:18:42
Stop	2023-10-19 10:33:42
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-10-19 09:53:09
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	**C**	**Z**
Under Range Peak	**79.1**	76.1	81.1 dB
Under Range Limit	**25.3**	26.0	31.7 dB
Noise Floor	16.1	16.8	22.5 dB

	First	**Second**	**Third**
Instrument Identification	Kimley-Horn & Associates, Inc.	1100 W.Town & Country Rd, 700	714.939.1030

Results

LAeq	72.7 dB	
LAE	102.2 dB	
EA	1.862 mPa²h	
LApeak (max)	2023-10-19 10:33:20	103.4 dB
LASmax	2023-10-19 10:33:21	87.9 dB
LASmin	2023-10-19 10:30:51	26.1 dB
SEA	-99.9 dB	

	Exceedance Counts	**Duration**
LAS > 85.0 dB	4	6.5 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	72.7	72.7	-99.9	72.7	72.7	-99.9	-99.9	dB

LCeq	77.6 dB
LAeq	72.7 dB
LCeq - LAeq	4.9 dB
LAleq	76.2 dB
LAeq	72.7 dB
LAleq - LAeq	3.5 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	72.7		77.6			
LS(max)	87.9	2023/10/19 10:33:21				
LS(min)	26.1	2023/10/19 10:30:51				
LPeak(max)	103.4	2023/10/19 10:33:20				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	80.3 dB
LA 10.00	77.6 dB
LA 33.30	65.6 dB
LA 50.00	58.3 dB
LA 66.60	48.7 dB
LA 90.00	35.4 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**	**6.3**	**8.0**	**10.0**	**12.5**	**16.0**	**20.0**	**25.0**	**31.5**	**40.0**	**50.0**	**63.0**	**80.0**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**6300**	**8000**	**10000**	**12500**	**16000**	**20000**
Direct	2019-10-29 12:18:45	-28.39	2.58	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-10-19 09:53:09	-28.77	63.35	59.53	59.80	60.05	59.26	51.90	50.02	52.03	48.84	46.55	50.54	47.61	46.89	46.07	45.77	45.37	39.84	35.92	36.51	38.46	31.89	29.71	113.97	49.24	18.70	66.40	18.70	58.20	18.79	27.05	21.17	22.20	23.65	25.46	27.63	30.59
PRMLxT1L	2023-10-18 08:47:49	-28.76	60.66	66.81	57.10	46.30	57.17	55.11	55.89	53.05	53.68	53.49	49.95	48.72	51.85	50.42	45.92	44.31	43.65	44.93	48.98	39.89	33.44	29.04	114.07	49.09	18.68	66.54	19.32	58.34	19.83	27.38	21.02	22.40	23.99	25.67	27.85	30.51
PRMLxT1L	2023-10-10 09:33:58	-28.85	60.24	58.27	55.95	51.16	53.85	49.38	57.60	52.63	59.92	61.16	59.63	57.88	61.60	61.48	60.16	55.35	54.35	50.96	52.97	51.43	38.31	38.40	113.89	48.91	25.20	66.07	19.31	58.70	19.97	27.63	21.27	22.26	23.67	25.43	27.73	30.42
PRMLxT1L	2023-08-31 10:04:48	-28.76	61.03	61.98	57.52	60.54	55.29	55.45	52.03	56.13	51.43	52.86	50.08	46.64	44.05	42.29	40.24	37.71	31.00	27.38	25.45	24.01	16.34	28.63	114.03	49.13	18.74	66.81	19.33	58.08	19.61	27.07	21.34	22.67	24.08	25.72	28.04	30.76
PRMLxT1L	2023-08-14 09:21:22	-28.80	71.99	60.72	64.53	70.08	63.71	67.13	60.17	57.01	58.38	57.73	57.84	53.97	43.98	41.61	39.62	31.13	30.71	31.16	26.66	22.48	18.46	28.88	113.96	49.06	19.58	66.31	19.22	58.61	19.98	27.20	21.45	22.57	24.00	25.60	27.84	30.65
PRMLxT1L	2023-08-02 08:47:34	-28.78	52.32	54.78	54.24	61.95	67.23	63.90	60.11	66.50	67.18	65.63	67.81	58.63	62.44	62.97	59.45	56.82	56.57	49.11	41.87	44.95	39.11	31.91	114.01	49.20	19.78	66.22	20.13	58.78	19.78	27.29	21.19	22.83	23.65	25.47	27.96	30.70
PRMLxT1L	2023-08-02 08:45:53	-28.81	63.42	57.07	62.26	59.06	64.40	63.93	61.00	59.31	57.80	60.57	63.65	73.88	60.21	63.97	56.12	59.45	55.95	51.94	48.19	48.57	41.68	32.21	113.92	49.05	20.13	66.18	19.50	58.69	19.68	27.63	21.29	22.46	23.81	25.75	27.85	30.58
PRMLxT1L	2023-07-13 12:40:44	-28.75	66.48	69.97	55.31	57.78	62.25	60.41	52.04	59.64	56.55	53.66	55.01	52.17	53.95	53.05	57.87	52.77	50.89	49.51	49.22	47.27	41.20	32.67	114.13	49.64	22.14	66.59	19.40	59.22	19.80	28.04	21.49	22.96	24.29	26.12	28.35	30.63
PRMLxT1L	2023-07-13 09:51:44	-28.90	59.31	60.71	58.62	58.55	59.70	61.21	55.40	52.93	54.87	52.65	50.34	53.26	56.31	49.85	55.07	47.59	42.80	42.90	36.42	37.06	30.68	29.45	113.98	49.32	18.75	66.17	19.46	59.00	19.93	27.68	21.66	22.12	23.76	25.78	27.67	30.87
PRMLxT1L	2023-07-13 09:23:44	-28.90	60.41	60.71	59.50	63.74	60.22	56.73	57.65	53.07	53.21	54.90	55.01	51.50	56.50	51.18	46.63	44.37	45.45	40.66	36.44	31.18	28.12	28.93	113.89	49.22	20.28	65.88	19.60	58.94	19.28	27.57	21.28	22.65	23.74	25.74	27.87	30.71
PRMLxT1L	2023-06-27 08:29:08	-28.80	62.55	58.54	56.17	61.21	48.58	46.35	57.62	53.72	60.54	57.94	56.79	54.45	51.06	47.79	42.98	39.91	36.82	39.43	37.83	26.63	25.08	29.05	114.00	48.90	19.00	66.00	19.76	58.87	20.08	27.50	21.16	22.32	23.59	25.56	28.00	30.62

Noise Measurement Field Data

Project:	RPCA Lear Solar	**Job Number:**	
Site No.:	ST-3	**Date:**	10/19/2023
Analyst:	Moody	**Time:**	10:37 AM
Location:			
Noise Sources:	Cars, tractor, insects, birds, pedestrians		
Comments:	**File: ING. 085**		

Results (dBA):

Leq:	**Lmin:**	**Lmax:**	**Peak:**
69.5	27.1	84.6	102.6

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	85
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.97 inHg
Humidity:	18%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.085.s
File Name on PC	LxTse_0005586-20231019 103806-lng.085.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-10-19 10:38:06
Stop	2023-10-19 10:53:06
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-10-19 09:53:09
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	**C**	**Z**
Under Range Peak	**79.1**	76.1	81.1 dB
Under Range Limit	**25.3**	26.0	31.7 dB
Noise Floor	16.1	16.8	22.5 dB

	First	**Second**	**Third**
Instrument Identification	Kimley-Horn & Associates, Inc.	1100 W.Town & Country Rd, 700	714.939.1030

Results

LAeq	69.5 dB	
LAE	99.0 dB	
EA	891.250 µPa²h	
LApeak (max)	2023-10-19 10:51:17	102.6 dB
LASmax	2023-10-19 10:51:17	84.6 dB
LASmin	2023-10-19 10:45:26	27.1 dB
SEA	-99.9 dB	

	Exceedance Counts	**Duration**
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	69.5	69.5	-99.9	69.5	69.5	-99.9	-99.9	dB

LCeq	74.0 dB
LAeq	69.5 dB
LCeq - LAeq	4.5 dB
LAleq	72.4 dB
LAeq	69.5 dB
LAleq - LAeq	2.9 dB

	A		**C**		**Z**	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	69.5		74.0			
LS(max)	84.6	2023/10/19 10:51:17				
LS(min)	27.1	2023/10/19 10:45:26				
LPeak(max)	102.6	2023/10/19 10:51:17				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	77.4 dB
LA 10.00	74.1 dB
LA 33.30	60.5 dB
LA 50.00	53.8 dB
LA 66.60	46.0 dB
LA 90.00	34.1 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**	**6.3**	**8.0**	**10.0**	**12.5**	**16.0**	**20.0**	**25.0**	**31.5**	**40.0**	**50.0**	**63.0**	**80.0**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**6300**	**8000**	**10000**	**12500**	**16000**	**20000**
Direct	2019-10-29 12:18:45	-28.39	2.58	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-10-19 09:53:09	-28.77	63.35	59.53	59.80	60.05	59.26	51.90	50.02	52.03	48.84	46.55	50.54	47.61	46.89	46.07	45.77	45.37	39.84	35.92	36.51	38.46	31.89	29.71	113.97	49.24	18.70	66.40	18.70	58.20	18.79	27.05	21.17	22.20	23.65	25.46	27.63	30.59
PRMLxT1L	2023-10-18 08:47:49	-28.76	60.66	66.81	57.10	46.30	57.17	55.11	55.89	53.05	53.68	53.49	49.95	48.72	51.85	50.42	45.92	44.31	43.65	44.93	48.98	39.89	33.44	29.04	114.07	49.09	18.68	66.54	19.32	58.34	19.83	27.38	21.02	22.40	23.99	25.67	27.85	30.51
PRMLxT1L	2023-10-10 09:33:58	-28.85	60.24	58.27	55.95	51.16	53.85	49.38	57.60	52.63	59.92	61.16	59.63	57.88	61.60	61.48	60.16	55.35	54.35	50.96	52.97	51.43	38.31	38.40	113.89	48.91	25.20	66.07	19.31	58.70	19.97	27.63	21.27	22.26	23.67	25.43	27.73	30.42
PRMLxT1L	2023-08-31 10:04:48	-28.76	61.03	61.98	57.52	60.54	55.29	55.45	52.03	56.13	51.43	52.86	50.08	46.64	44.05	42.29	40.24	37.71	31.00	27.38	25.45	24.01	16.34	28.63	114.03	49.13	18.74	66.81	19.33	58.08	19.61	27.07	21.34	22.67	24.08	25.72	28.04	30.76
PRMLxT1L	2023-08-14 09:21:22	-28.80	71.99	60.72	64.53	70.08	63.71	67.13	60.17	57.01	58.38	57.73	57.84	53.97	43.98	41.61	39.62	31.13	30.71	31.16	26.66	22.48	18.46	28.88	113.96	49.06	19.58	66.31	19.22	58.61	19.98	27.20	21.45	22.57	24.00	25.60	27.84	30.65
PRMLxT1L	2023-08-02 08:47:34	-28.78	52.32	54.78	54.24	61.95	67.23	63.90	60.11	66.50	67.18	65.63	67.81	58.63	62.44	62.97	59.45	56.82	56.57	49.11	41.87	44.95	39.11	31.91	114.01	49.20	19.78	66.22	20.13	58.78	19.78	27.29	21.19	22.83	23.65	25.47	27.96	30.70
PRMLxT1L	2023-08-02 08:45:53	-28.81	63.42	57.07	62.26	59.06	64.40	63.93	61.00	59.31	57.80	60.57	63.65	73.88	60.21	63.97	56.12	59.45	55.95	51.94	48.19	48.57	41.68	32.21	113.92	49.05	20.13	66.18	19.50	58.69	19.68	27.63	21.29	22.46	23.81	25.75	27.85	30.58
PRMLxT1L	2023-07-13 12:40:44	-28.75	66.48	69.97	55.31	57.78	62.25	60.41	52.04	59.64	56.55	53.66	55.01	52.17	53.95	53.05	57.87	52.77	50.89	49.51	49.22	47.27	41.20	32.67	114.13	49.64	22.14	66.59	19.40	59.22	19.80	28.04	21.49	22.96	24.29	26.12	28.35	30.63
PRMLxT1L	2023-07-13 09:51:44	-28.90	59.31	60.71	58.62	58.55	59.70	61.21	55.40	52.93	54.87	52.65	50.34	53.26	56.31	49.85	55.07	47.59	42.80	42.90	36.42	37.06	30.68	29.45	113.98	49.32	18.75	66.17	19.46	59.00	19.93	27.68	21.66	22.12	23.76	25.78	27.67	30.87
PRMLxT1L	2023-07-13 09:23:44	-28.90	60.41	60.71	59.50	63.74	60.22	56.73	57.65	53.07	53.21	54.90	55.01	51.50	56.50	51.18	46.63	44.37	45.45	40.66	36.44	31.18	28.12	28.93	113.89	49.22	20.28	65.88	19.60	58.94	19.28	27.57	21.28	22.65	23.74	25.74	27.87	30.71
PRMLxT1L	2023-06-27 08:29:08	-28.80	62.55	58.54	56.17	61.21	48.58	46.35	57.62	53.72	60.54	57.94	56.79	54.45	51.06	47.79	42.98	39.91	36.82	39.43	37.83	26.63	25.08	29.05	114.00	48.90	19.00	66.00	19.76	58.87	20.08	27.50	21.16	22.32	23.59	25.56	28.00	30.62

Noise Measurement Field Data

Project:	RPCA Lear Solar	**Job Number:**	
Site No.:	ST-4	**Date:**	10/19/2023
Analyst:	Moody	**Time:**	10:58 AM
Location:	Construction, cars, plane, motorcycle, insects		
Noise Sources:			
Comments:	**File Ing.086**		

Results (dBA):

Leq:	**Lmin:**	**Lmax:**	**Peak:**
40.5	23.5	56.9	75.8

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	86
Wind (mph):	<5
Sky:	Clear
Bar. Pressure:	29.97 inHg
Humidity:	17%

Photo:

Kimley»Horn

Summary

File Name on Meter	lng.086.s
File Name on PC	LxTse_0005586-20231019 105850-lng.086.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2023-10-19 10:58:50
Stop	2023-10-19 11:13:50
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2023-10-19 09:53:09
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	122.6 dB

	A	C	Z
Under Range Peak	**79.1**	76.1	81.1 dB
Under Range Limit	**25.3**	26.0	31.7 dB
Noise Floor	16.1	16.8	22.5 dB

	First	Second	Third
Instrument Identification	Kimley-Horn & Associates, Inc.	1100 W.Town & Country Rd, 700	714.939.1030

Results

LAeq	40.5 dB	
LAE	70.0 dB	
EA	1.122 µPa²h	
LApeak (max)	2023-10-19 10:59:11	75.8 dB
LASmax	2023-10-19 10:59:54	56.9 dB
LASmin	2023-10-19 11:04:14	23.5 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**	
	40.5	40.5	-99.9	40.5	40.5	-99.9	-99.9	dB

LCeq	55.4 dB
LAeq	40.5 dB
LCeq - LAeq	14.9 dB
LAleq	42.5 dB
LAeq	40.5 dB
LAleq - LAeq	2.0 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	40.5		55.4			
LS(max)	56.9	2023/10/19 10:59:54				
LS(min)	23.5	2023/10/19 11:04:14				
LPeak(max)	75.8	2023/10/19 10:59:11				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	43.6 dB
LA 10.00	41.8 dB
LA 33.30	37.6 dB
LA 50.00	35.5 dB
LA 66.60	32.3 dB
LA 90.00	28.4 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**	**6.3**	**8.0**	**10.0**	**12.5**	**16.0**	**20.0**	**25.0**	**31.5**	**40.0**	**50.0**	**63.0**	**80.0**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**6300**	**8000**	**10000**	**12500**	**16000**	**20000**
Direct	2019-10-29 12:18:45	-28.39	2.58	5.73	0.93	0.50	3.86	9.51	0.44	-3.11	1.43	6.00	2.05	-3.57	7.95	14.24	0.02	5.29	13.46	6.91	5.51	6.87	6.62	5.46	4.67	7.03	8.87	9.88	11.23	13.40	11.42	40.36	23.45	16.13	16.83	19.76	18.96	19.66
PRMLxT1L	2023-10-19 09:53:09	-28.77	63.35	59.53	59.80	60.05	59.26	51.90	50.02	52.03	48.84	46.55	50.54	47.61	46.89	46.07	45.77	45.37	39.84	35.92	36.51	38.46	31.89	29.71	113.97	49.24	18.70	66.40	18.70	58.20	18.79	27.05	21.17	22.20	23.65	25.46	27.63	30.59
PRMLxT1L	2023-10-18 08:47:49	-28.76	60.66	66.81	57.10	46.30	57.17	55.11	55.89	53.05	53.68	53.49	49.95	48.72	51.85	50.42	45.92	44.31	43.65	44.93	48.98	39.89	33.44	29.04	114.07	49.09	18.68	66.54	19.32	58.34	19.83	27.38	21.02	22.40	23.99	25.67	27.85	30.51
PRMLxT1L	2023-10-10 09:33:58	-28.85	60.24	58.27	55.95	51.16	53.85	49.38	57.60	52.63	59.92	61.16	59.63	57.88	61.60	61.48	60.16	55.35	54.35	50.96	52.97	51.43	38.31	38.40	113.89	48.91	25.20	66.07	19.31	58.70	19.97	27.63	21.27	22.26	23.67	25.43	27.73	30.42
PRMLxT1L	2023-08-31 10:04:48	-28.76	61.03	61.98	57.52	60.54	55.29	55.45	52.03	56.13	51.43	52.86	50.08	46.64	44.05	42.29	40.24	37.71	31.00	27.38	25.45	24.01	16.34	28.63	114.03	49.13	18.74	66.81	19.33	58.08	19.61	27.07	21.34	22.67	24.08	25.72	28.04	30.76
PRMLxT1L	2023-08-14 09:21:22	-28.80	71.99	60.72	64.53	70.08	63.71	67.13	60.17	57.01	58.38	57.73	57.84	53.97	43.98	41.61	39.62	31.13	30.71	31.16	26.66	22.48	18.46	28.88	113.96	49.06	19.58	66.31	19.22	58.61	19.98	27.20	21.45	22.57	24.00	25.60	27.84	30.65
PRMLxT1L	2023-08-02 08:47:34	-28.78	52.32	54.78	54.24	61.95	67.23	63.90	60.11	66.50	67.18	65.63	67.81	58.63	62.44	62.97	59.45	56.82	56.57	49.11	41.87	44.95	39.11	31.91	114.01	49.20	19.78	66.22	20.13	58.78	19.78	27.29	21.19	22.83	23.65	25.47	27.96	30.70
PRMLxT1L	2023-08-02 08:45:53	-28.81	63.42	57.07	62.26	59.06	64.40	63.93	61.00	59.31	57.80	60.57	63.65	73.88	60.21	63.97	56.12	59.45	55.95	51.94	48.19	48.57	41.68	32.21	113.92	49.05	20.13	66.18	19.50	58.69	19.68	27.63	21.29	22.46	23.81	25.75	27.85	30.58
PRMLxT1L	2023-07-13 12:40:44	-28.75	66.48	69.97	55.31	57.78	62.25	60.41	52.04	59.64	56.55	53.66	55.01	52.17	53.95	53.05	57.87	52.77	50.89	49.51	49.22	47.27	41.20	32.67	114.13	49.64	22.14	66.59	19.40	59.22	19.80	28.04	21.49	22.96	24.29	26.12	28.35	30.63
PRMLxT1L	2023-07-13 09:51:44	-28.90	59.31	60.71	58.62	58.55	59.70	61.21	55.40	52.93	54.87	52.65	50.34	53.26	56.31	49.85	55.07	47.59	42.80	42.90	36.42	37.06	30.68	29.45	113.98	49.32	18.75	66.17	19.46	59.00	19.93	27.68	21.66	22.12	23.76	25.78	27.67	30.87
PRMLxT1L	2023-07-13 09:23:44	-28.90	60.41	60.71	59.50	63.74	60.22	56.73	57.65	53.07	53.21	54.90	55.01	51.50	56.50	51.18	46.63	44.37	45.45	40.66	36.44	31.18	28.12	28.93	113.89	49.22	20.28	65.88	19.60	58.94	19.28	27.57	21.28	22.65	23.74	25.74	27.87	30.71
PRMLxT1L	2023-06-27 08:29:08	-28.80	62.55	58.54	56.17	61.21	48.58	46.35	57.62	53.72	60.54	57.94	56.79	54.45	51.06	47.79	42.98	39.91	36.82	39.43	37.83	26.63	25.08	29.05	114.00	48.90	19.00	66.00	19.76	58.87	20.08	27.50	21.16	22.32	23.59	25.56	28.00	30.62

Project: RPCA Lear

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Single-Family Residential	1,242	0	N
2	Single-Family Residential	1,571	0	S
3			0	
4			0	
5			0	
6			0	
7			0	

Construction Phase	Equipment Type	No. of Equip.	Acoustical Usage Factor	Reference Noise Level at 50ft per Unit, Lmax	RECEPTOR 1 Noise Level at Receptor 1, Lmax	RECEPTOR 1 Noise Level at Receptor 1, Leq	RECEPTOR 2 Noise Level at Receptor 2, Lmax	RECEPTOR 2 Noise Level at Receptor 2, Leq
Demolition								
	Dozer	2	40%	82	56.8	52.8	54.8	50.8
	Excavator	3	40%	81	57.6	53.6	55.5	51.5
	Concrete Saw	1	20%	90	61.7	54.7	59.7	52.7
Combined LEQ						**58.5**		**56.5**
Site Preparation								
	Tractor	1	40%	84	56.1	52.1	54.1	50.1
	Dozer	1	40%	82	53.8	49.8	51.8	47.8
			#N/A	#N/A	0.0	0.0	0.0	0.0
Combined LEQ						**54.1**		**52.1**
Grading								
	Excavator	2	40%	81	55.8	51.8	53.8	49.8
	Dozer	2	40%	82	56.8	52.8	54.8	50.8
	Pickup Truck	1	40%	75	47.1	43.1	45.1	41.1
	Front End Loader	1	40%	79	51.2	47.2	49.2	45.2
	Roller	2	20%	80	55.1	48.1	53.1	46.1
Combined LEQ						**56.8**		**54.8**
Construction/Installation								
	Crane	1	16%	81	52.7	44.7	50.7	42.7
	Impact Pile Driver	2	20%	101	76.4	69.4	74.4	67.4
	All Other Equipment > 5 HP	1	50%	85	57.1	54.1	55.1	52.0
	Tractor	1	40%	84	56.1	52.1	54.1	50.1
	Excavator	1	40%	81	52.8	48.8	50.8	46.8
	Pickup Truck	1	40%	75	47.1	43.1	45.1	41.1
	Concrete Mixer Truck	1	40%	79	50.9	46.9	48.9	44.9
	Dozer	1	40%	82	53.8	49.8	51.8	47.8
	Slurry Trenching Machine	1	50%	80	52.5	49.5	50.5	47.4
	Front End Loader	2	40%	79	54.2	50.2	52.2	48.2
Combined LEQ						**69.8**		**67.7**
PV Panel Vendor Trips								
	Tractor	1	40%	84	56.1	52.1	54.1	50.1
Combined LEQ						**52.1**		**50.1**
Paving								
	Roller	1	20%	80	52.1	45.1	50.1	43.1
Combined LEQ						**45.1**		**43.1**

Source for Ref. Noise Levels: RCNM, 2005

Construction Truck Pass-By Noise

Source	Noise Level	Reference Dist. (feet)	Dist. to Receptor (feet)	Distance Attenuation	Duration (minutes)
Truck passby (arrival, departure)	70	50	50	70.0	4.42
				Total*	4.42

Trucks
26.0

Results		
Truck Pass-by Noise Levels at 50 feet from Roadway Centerline		Exceeds Daytime Noise Standard?
Metric	Exterior	Exterior
$L_{eq(15\text{-}min)}$	64.7	No
L_{max}	70.0	No

** Duration assumes 0.17 minutes per truck during a pass-by event.*

Reference Level Source: University of Washington, Dept of Environmental and Occupational Health Sciences, Noise Navigator Sound Level Database, July 6, 2010

Project: Lear Solar
BESS

Noise Level Per unit = L1 - 10 LOG (n)

Reference Noise Level (L1):[1]	68	dBA_1
Number of Sources (n):	150	(total number of HVAC units)
Reference Level Per Unit:	46.2	dBA_2

1. Reference Noise Level Source: Kern County Planning and Natural Resources Department, Acoustical Assessment for the AVEP Project, August 5, 2020

The reference noise level is based on simultaneous operation of approximately 150 HVAC units for a facility greater than 600 acres in size with a storage capacity of 1,000 MW.

2. Calculated with the inverse square law:

where: dBA_1 = Reference Noise Level, dBA_2 = Estimated Noise Level

3. Conservatively assumes all units are the same distance from the receptor.

Noise Level Multiplication

$$L_\Sigma = 10 \cdot \log_{10}(n) + L_1$$

Reference Noise Level:[1]	46.2	dBA per unit
Reference Distance:	50	feet
Number of Sources:	3	(total number of HVAC units)
Total Noise Level (at 50 feet):	51.0	dBA
Distance to Receptor:	354	feet
Noise Level at Receptor:[2, 3]	34.0	dBA

1. Reference Noise Level Source: Kern County Planning and Natural Resources Department, Acoustical Assessment for the AVEP Project, August 5, 2020

The reference noise level is based on simultaneous operation of approximately 150 HVAC units for a facility greater than 600 acres in size with a storage capacity of 1,000 MW.

2. Calculated with the inverse square law:

where: dBA_1 = Reference Noise Level, dBA_2 = Estimated Noise Level, d_1 = Reference Distance, and d_2 = Receptor Location Distance

3. Conservatively assumes all units are the same distance from the receptor.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name: Lear Solar Project
Project Number: Operational Trips
Scenario: Horizon Year
Ldn/CNEL: CNEL

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

							Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1			1	20	4	35	0	25.0%	25.0%	36.6	-	-	-	-

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

Equipment		PPV at 25 feet (in/sec)	Calculated distance (feet)	Approximate L_V (VdB) at 25 feet	Calculated distance (feet)
			100		**100**
Pile Driver (impact)	upper range	1.518	0.1898	112	94
	typical	0.644	0.0805	104	86
Pile Driver (sonic)	upper range	0.734	0.0918	105	87
	typical	0.17	0.0213	93	75
Clam shovel drop (slurry wall)		0.202	0.0253	94	76
Hydromill (slurry wall)	in soil	0.008	0.0010	66	48
	in rock	0.017	0.0021	75	57
Vibratory Roller		0.21	0.0263	94	76
Hoe Ram		0.089	0.0111	87	69
Large bulldozer		0.089	0.0111	87	69
Caisson drilling		0.089	0.0111	87	69
Loaded trucks		0.076	0.0095	86	68
Jackhammer		0.035	0.0044	79	61
Small bulldozer		0.003	0.0004	58	40
Rock Breaker		0.059	0.0074		

$L_v(D) = L_v(25\ feet) - (30 \times \log_{10}(D/25\ feet))$

Source: FTA, Noise and Vibration Manual, 2006. Page 12-11.

	PPV at 50 ft	
Blasting	0.4	0.1414

Notes:
1. Calculated using the following formula:
PPV equip = PPVref x (25/D)1.5

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from Table 12-2 of the FTA Transit Noise and Vibration Impact Assessment Guidelines
D = the distance from the equipment to the receiver

Custom

Equipment	PPV at 25 feet (in/sec)	Calculated distance (feet)	Calculated distance (feet)
		168	
Large bulldozer	0.089	0.005	
Loaded trucks	0.076	0.004	
Small bulldozer	0.003	0.00017	
Vibratory compactor/roller	0.21	0.012	