SECTION 4.6

NOISE

This section defines technical terminology used in the analysis of noise; identifies federal, state and local regulations applicable to noise; and describes the environmental setting with regard to existing ambient noise levels. This section also analyzes potential noise impacts associated with construction, operation and decommissioning of the proposed Battery Energy Storage System. The information in this section is based on the *Noise Assessment, Campo Verde Battery Storage System for Campo Verde Solar Facility, County of Imperial* prepared by Ldn Consulting, Inc. (Ldn, 2016c). This document is provided on the attached CD of Technical Appendices as **Appendix F** of this SEIR.

DEFINITIONS AND TERMINOLOGY

The following discussion includes a variety of acronyms used to describe noise. To facilitate understanding of this section, the following glossary of terms is provided as an introduction to the environmental setting for noise. While some of the terms are technical in nature, these acronyms and abbreviations are essential to describe and characterize noise.

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs.

Measurements

A-weighting/dBA. Because the human ear is unable to differentiate differences in sound levels at all frequencies, a special frequency-dependent rating scale, referred to as A-weighted sound pressure level, or dBA, has been developed to relate noise to human sensitivity. A-weighting compensates for the variability in perceived noise levels by weighing some sound frequencies as more than others. The A-weighted sound level adequately describes the instantaneous noise whereas community noise is measured using dBA.

Community Noise Equivalent Level (CNEL). The Community Noise Equivalent Level (CNEL) is the 24-hour A-weighted average for sound with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

For example, noise samples taken between the hours of 7 p.m. and 10 p.m. are boosted by 5 dB to reflect increased sensitivity to noise in evening hours. Similarly, noise samples taken during the overnight and early morning hours between 10 p.m. and 7 a.m. are weighted by 10 dB to reflect even greater sensitivity to noise during the hours when most people would be sleeping. The CNEL scale is used by Imperial County for land use/noise compatibility assessment.

Corona Affect (Corona). Phenomenon associated with the electrical ionization of the air that occurs near the surface of the energized conductor and suspension hardware due to very high electric field strength. This is audible power line noise that is generated from electric Corona discharge, which is usually experienced as a random crackling or hissing sound.

Day Night Sound Level (Ldn). Representing the Day/Night sound level, this measurement is a 24-hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for night time noise. Typically, Ldn is measured using A weighting.

Decibel (dB). The decibel (dB) is the standard unit of measurement of noise. The decibel measurement is logarithmic which means that an increase of one decibel equates to a tenfold increase in the noise level. A noise level of zero (0) dB is barely audible and is considered the threshold of human hearing while noise levels in excess of 120 dB approach the pain threshold (e.g. jet engine noise). In between these extremes, a quiet rural area with would have sound levels of approximately 20 dB and normal speech has a sound level of approximately 60 dB.

The smallest change in sound level detectable by the human ear is approximately 3 dB. The average person perceives a change in sound level of 10 dB as a doubling (or halving) of the level of loudness.

Equivalent sound level (L_{eq}). The true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Leq. The equivalent sound level, or L_{eq}, represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval. Leq refers to the true equivalent sound level averaged over a sample length of time.

Sound Pressure Level (SPL). A ratio of one sound pressure to a reference pressure (L_{ref}) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log (L/L_{ref}).

Minimum Sound Level (L_{min}). Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}). Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Octave Band. An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band. A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

Localized Noise

Sound from a small localized source (a "point" source) radiates uniformly outward as it travels away from the source. The sound level attenuates or drops-off at a rate of 6 dBA for each doubling of distance.

Mobile Noise

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore, the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiate in an almost oblique fashion from the source and decrease at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. In contrast, fixed or point sources radiate outward uniformly as it travels

away from the source. Point source sound levels attenuate or decrease at a rate of 6 dBA for each doubling of distance.

Noise Attenuation

Noise attenuation refers to the decline in noise level that occurs in association with increased distance from the receptor. Sounds generated from a point source typically attenuate or decrease at a rate of 6 dBA for each doubling of distance. For example, a noise level of 87 dBA measured at 50 feet from the noise source would be reduced to 81 dBA at 100 feet from the source and be further reduced to 75 dBA at 200 feet from the source. When the noise source is a continuous line (e.g., vehicle traffic on a highway), the noise levels radiate in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions (e.g. concrete, asphalt and hard pack dirt) and at a rate of 4.5 dBA for soft site conditions (e.g. areas having slight grade changes, landscaped areas and vegetation). Barriers, obstructions, and weather conditions can all affect how noise travels.

Noise Reduction Methods

The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods could be required to reduce noise levels to an acceptable level.

4.6.1 REGULATORY FRAMEWORK

A. FEDERAL

The Noise Control Act of 1972 (P.L. 92-574)

The Noise Control Act and several other federal laws require the federal government to set and enforce uniform noise standards for aircraft and airports, interstate motor carriers and railroads, workplace activities, medium and heavy-duty trucks. Most federal noise standards focus on preventing hearing loss by limiting exposure to sounds of 90 dBA and higher. However, some are stricter and focus on limiting exposure to quieter levels that are annoying to most individuals and can diminish one's quality of life.

Occupational Safety and Health Act of 1970

The Federal Occupational Safety and Health Administration (OSHA) regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an 8-hour work shift (29 Code of Regulations [CFR] 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices testing employees for hearing loss on a periodic basis.

B. STATE

The California Occupational Safety and Health Administration (CalOSHA) has codified employee noise exposure limits as part of the State Occupational Noise Exposure Regulations (California Code of Regulations, Title 8, Section 5095–5099). The CalOSHA regulations are the same as the Federal OSHA standards in terms of dBA and duration.

The Governor's Office of Planning and Research published the *State of California General Plan Guidelines 2003* to provide direction on preparation of the various elements of a General Plan. With regard to noise, "Appendix C - Guidelines for the Preparation and Content of the Noise Element of the General Plan" provides guidance for the acceptability of projects within specific noise contours. The Guidelines identify various land use categories and Table 1 of the Guidelines

includes adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of a specific community. Imperial County used the adjustment factors to modify the state's Noise/Land Use Compatibility standards for the purpose of implementing the Noise Element of its General Plan.

C. LOCAL

County of Imperial General Plan

The Noise Element of the Imperial County General Plan identifies and defines existing and future environmental noise levels from sources of noise within or adjacent to the County; establishes goals and objectives to address these impacts, and provides Implementation Programs to implement these goals and objectives. **Table 4.6-1** summarizes the Project's consistency with the applicable General Plan noise policies. While this SEIR analyzes the Project's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Imperial County Board of Supervisors ultimately determines consistency with the General Plan.

TABLE 4.6-1
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Policies	Consistent with General Plan?	Analysis
Noise Element		
Programs and Policies		
Acoustical Analysis of Proposed Projects The County shall require the analysis of proposed discretionary projects which may generate excessive noise or which may be impacted by existing excessive noise levels, including but not limited to the following: An analysis shall be required for any project which would be located, all or in part, in a Noise Impact Zone as specified above. An analysis shall be required for any project which has the potential to generate noise in excess of the Property Line Noise Limits stated in Table 9. An analysis shall be required for any project which, although not located in a Noise Impact Zone, has the potential to result in a significant increase in noise levels to sensitive receptors in the community. An acoustical analysis and report shall be prepared by a person deemed qualified by the Director of Planning. The report shall describe the existing noise environment, the proposed project, the projected noise impact	Yes	A Noise Assessment was prepared for the project by Ldn Consulting, Inc., (Ldn, 2016c). Short-term construction and long-term operational noise levels were found to be less than established thresholds. Thus, the proposed Project is consistent with this policy.

TABLE 4.6-1
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Policies	Consistent with General Plan?	Analysis
and, if required, the proposed mitigation to ensure conformance with applicable standards.		
2) Noise/Land Use Compatibility. Where acoustical analysis of a proposed project is required, the County shall identify and evaluate potential noise/land use conflicts that could result from the implementation of the project. Projects which result in noise levels that exceed the "Normally Acceptable" criteria of the Noise/Land Use Compatibility Guidelines, Table 7, shall include mitigation measures to eliminate or reduce to an acceptable level the adverse noise impacts.	Yes	Refer to analysis of Policy 1.
5) New Noise Generating Projects. The County shall identify and evaluate projects which have the potential to generate noise in excess of the Property Line Noise Limits. An acoustical analysis must be submitted which demonstrates the project's compliance.	Yes	Refer to analysis of Policy 1.
6) Project Which Generate Off-site Traffic Noise. The acoustical analysis shall identify and evaluate projects which will generate traffic and increase noise levels on off-site roadways. If the project site has the potential to cause a significant noise impact to sensitive receptors along those roadways, the acoustical analysis report shall consider noise reduction measures to reduce the impact to a level less than significant.	Yes	Refer to analysis of Policy 1.

Operational Standards

The Property Line Noise Limits listed in Table 9 of the County's General Plan Noise Element and the County's Ordinance, Title 9, Division 7 (Noise Abatement and Control) Section 90702.00 Subsection A provides acceptable Sound level limits based on the property zoning. **Table 4.6-2** summarizes the applicable property line sound level limits that shall apply to noise generation from one property to an adjacent property. The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standards may be appropriate. These standards do not apply to construction noise.

TABLE 4.6-2
PROPERTY LINE NOISE LEVEL LIMITS

Zone	Time	Applicable Limit One-hour Average Sound Level
Residential Zones	7 a.m. to 10 p.m.	50 dB
	10 p.m. to 7 a.m.	45 dB
Multi-residential Zones	7 a.m. to 10 p.m.	55 dB
	10 p.m. to 7 a.m.	50 dB
Commercial Zones	7 a.m. to 10 p.m.	60 dB
	10 p.m. to 7 a.m.	55 dB
Light Industrial/Industrial Park Zones	Anytime	70 dB
General Industrial Zones	Anytime	75 dB
When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dB L_{eq}.		
The sound level limit between two zoning districts (different land uses) shall be measured at the property line between the properties.		
Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of subsection A of this section, measured at or beyond six feet from the boundary of the easement upon which the equipment is located.		
This section does not apply to noise generated by helicopters at heliports or helistops authorized by a conditional use permit.		
This section does not apply to noise generated by standard agricultural field operating practices such as planting and harvesting of crops. The County of Imperial has a Right to Farm Ordinance (1031) which serves as recognition to agricultural practices to new development. Agricultural/industrial operations shall comply with the noise levels prescribed under the general industrial zones		

Source: County of Imperial Ordinance, Title 9, Division 7 (Noise Abatement and Control) in Ldn 2012c.

These standards are intended to be enforced through the County's code enforcement program on the basis of complaints received from persons impacted by excessive noise. It must be acknowledged that a noise nuisance may occur even though an objective measurement with a sound level meter is not available. In such cases, the County may act to restrict disturbing, excessive, or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in an area.

County of Imperial Construction Standards

Construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dB Leq, when averaged over an eight (8) hour period, and measured at the nearest sensitive receptor. This standard assumes a construction period, relative to an individual sensitive receptor of days or weeks. In cases of extended length construction times, the standard may be tightened so as not to exceed 75 dB Leq when averaged over a one (1) hour period.

Significant Increase of Ambient Noise Levels

The increase of noise levels generally results in an adverse impact to the noise environment. The Noise/Land Use Compatibility Guidelines are not intended to allow the increase of ambient noise levels up to the maximum without consideration of feasible noise reduction measures. The following guidelines are established by the County of Imperial for the evaluation a of significant noise impact.

a. If the future noise level after the project is completed will be within the "normally acceptable" noise levels shown in the Noise/Land Use Compatibility Guidelines, but will result in an increase of 5 dB CNEL or greater, the project will have a potentially significant noise impact and mitigation measures must be considered.

b. If the future noise level after the project is completed will be greater than the "normally acceptable" noise levels shown in the Noise/Land Use Compatibility Guidelines, a noise increase of 3 dB CNEL or greater shall be considered a potentially significant noise impact and mitigation measures must be considered.

Guidelines for the Determination of Significance

The County Ordinance, Title 9, Division 7 (Noise Abatement and Control) states it is unlawful for any person to make or cause any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of their property exceeds the applicable limits provided above in **Table 4.6-2**. The Project and surrounding properties are zoned as A-2, General Agriculture; A-2-R - General Agriculture, Rural Zone; and A-3, Heavy Agriculture.

To be conservative, for the purposes of this analysis the most restrictive applicable sound limits identified in Section 90702.00 of the Noise Ordinance will be applied to accommodate the planning of not just existing but potential future residential uses that could be adjacent to the proposed Project. Section 90702.00 of the Noise Ordinance sets a sound level limit of 50 dBA Leq for daytime hours of 7 a.m. to 10 p.m. and 45 dBA Leq during the noise sensitive nighttime hours of 10 p.m. to 7 a.m. for residential noise sensitive land uses. Most of the Battery Energy Storage System components will only operate during the daytime hours but a few may operate during nighttime or early morning hours (such as HVAC systems) and therefore the most restrictive and conservative approach is to apply the 45 dBA Leq nighttime standard at the property lines.

Vibration Standards

The County has not yet adopted vibration criteria. The United States Department of Transportation Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration. For purposes of identifying potential project-related vibration impacts, the FTA criteria will be used. The human reaction to various levels of vibration is highly subjective. The upper end of the range shown for the threshold of perception, or roughly 65 VdB, may be considered annoying by some people. Vibration below 65 VdB may also cause secondary audible effects, such as a slight rattling of doors, suspended ceilings/fixtures, windows, and dishes, any of which may result in additional annoyance. **Table 4.6-3** shows the FTA groundborne vibration and noise impact criteria for human annoyance.

TABLE 4.6-3
VIBRATION AND NOISE IMPACT CRITERIA (HUMAN ANNOYANCE)

	Groundborne Vibration Impact Levels (VdB re 1 microinch/second)			Groundborne Noise Impact Levels (dB re 20 micropascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: United States Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* June 2006, in Ldn 2016c.

[1] "Frequent Events" are defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter truck lines have this many operations.

[3] "Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines

[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[5] Vibration-sensitive equipment is not sensitive to groundborne noise.

TABLE 4.6-4
VIBRATION IMPACT CRITERIA (STRUCTURAL DAMAGE)

Building Category	PPV (in/sec)	VdB
I. Reinforced-concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: United States Department of Transportation Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, *June 2006.*
Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

4.6.2 ENVIRONMENTAL SETTING

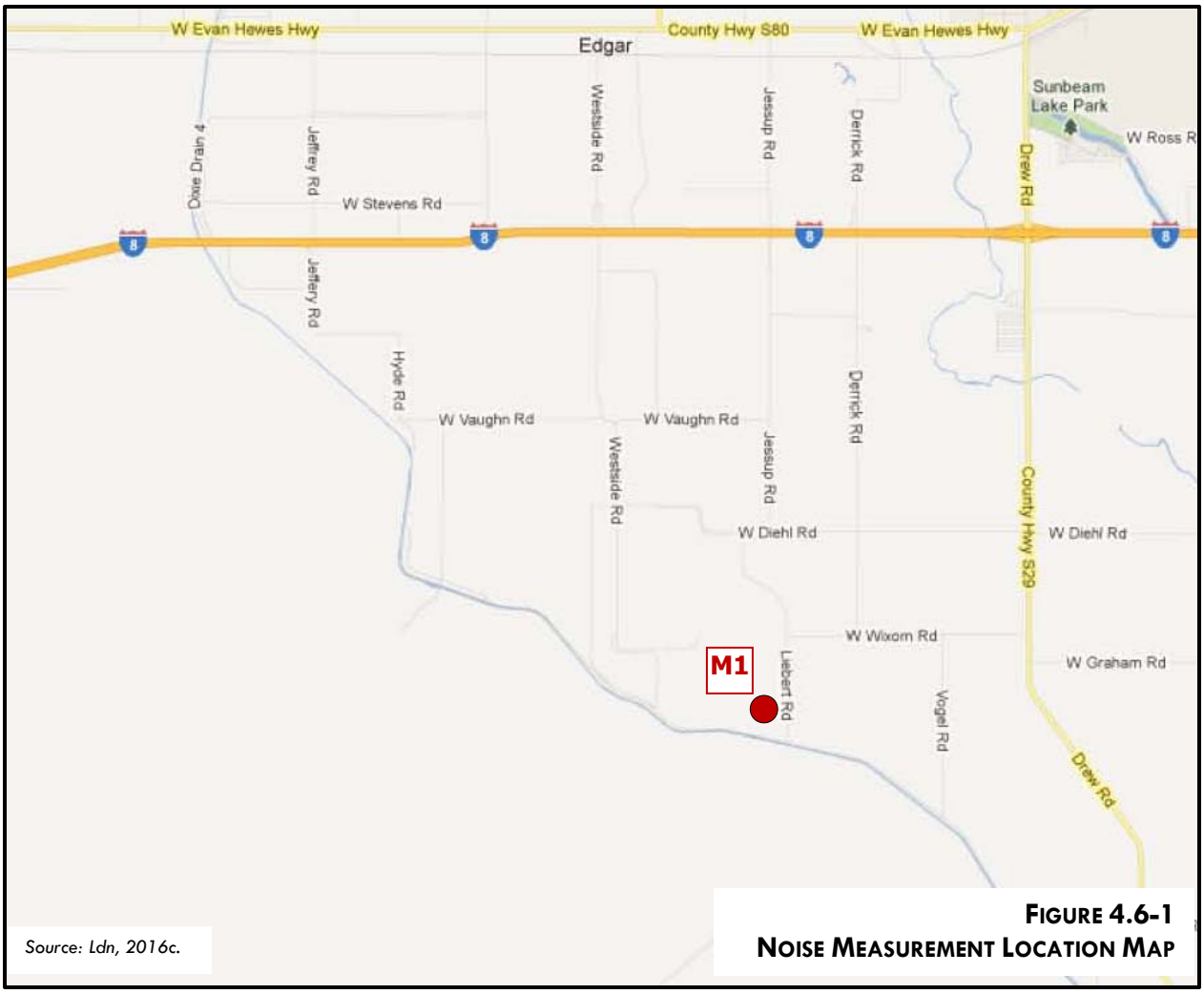
The noise analysis provided in this section is summarized from *Noise Assessment, Campo Verde Battery Storage System for Campo Verde Solar Facility, County of Imperial* prepared by Ldn Consulting, Inc. (Ldn 2016c). This document is provided on the attached CD of Technical Appendices as **Appendix F** of this SEIR.

The Project is a proposed within the boundaries of the Campo Verde Solar Project located in the approximately 7 miles southwest of the community of El Centro, California. The Project site is south of I-8 and west of Drew Road and northeast of the Westside Main Canal. The Project site is located in the Salton Sea Air Basin (SSAB).

On-site Ambient Noise

To determine the existing noise environment and to assess potential noise impacts, measurements were taken on the Project site having a direct line of site to the adjacent roadways. The noise measurements were recorded on September 15, 2016 by Ldn Consulting between approximately 3:30 p.m. and 3:45 p.m. The noise monitoring location is provided graphically in **Figure 4.6-1**. Noise measurements gathered at the Project site were taken using a Larson-Davis Model LxT Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

The noise measurement location was determined based on site access and noise impact potential. Monitoring location 1 (M1) was located roughly 30-feet from Liebert Road east of the site. **Table 4.6-5** shows the results of the noise measurements. The noise measurements were monitored for a period of 15 minutes. The existing noise levels in the Project area consisted primarily of existing agricultural operations near the Project site and on-site operations of the Campo Verde Solar Project. The ambient Leq noise levels measured in the area of the Project site during the mid-day were found to be between below 50 dBA Leq and 90% (L90) of the noise levels were 36 dBA.



Source: Ldn, 2016c.

FIGURE 4.6-1
NOISE MEASUREMENT LOCATION MAP

The noise levels and the distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in **Table 4.6-5** for Year 2016 without Project traffic (i.e. existing conditions). As shown, the noise level for all segments is below 60 dBA CNEL. Thus, the existing traffic noise in the Project area is relatively low.

TABLE 4.6-5
EXISTING TRAFFIC NOISE LEVELS (WITHOUT PROJECT)

Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Drew Road				
North of Wixom Road	381	55	52.7	33
South of Wixom Road	334	55	52.1	30
Wixom Road				
From Liebert Road to Drew Road	174	40	46.2	12

[1] *LOS Engineering, Inc. 2016, Ldn 2016c.*

4.6.3 IMPACTS AND MITIGATION MEASURES

A. STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines, as listed in Appendix G. The proposed Project would result in a significant impact to noise if it would result in any of the following:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

e) For a project located within 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?

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

B. ISSUES SCOPED OUT

Note that two CEQA significance criteria were scoped out as part of the CEQA Appendix G Environmental Checklist Form. Therefore, no impact is identified for this issue area. Criteria "e" and "f" were also eliminated because the Project site is not located within two miles of a public airport or a private airstrip. Thus, the Project site would not be exposed to excessive aircraft noise. No impacts have been identified for these issue areas.

C. METHODOLOGY

Construction Noise

Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and scrapers can reach relatively high levels. Grading activities typically represent one of the highest potential sources of construction noise. However, minimal grading will be necessary because the area surrounding the Campo Verde Substation was previously graded and compacted. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment at a distance of 50 feet can range from 60 dBA for a small tractor up to 100 dBA for rock breakers. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 87 dBA measured at 50 feet from the noise source would be reduced to 81 dBA at 100 feet from the source and be further reduced to 75 dBA at 200 feet from the source.

Calculations of the expected construction noise impacts were completed using a point-source noise prediction model. The essential model input data for these performance equations include the

source levels of each type of equipment, relative source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day, also referred to as the duty-cycle and any transmission loss from topography or barriers. To determine the worst-case noise levels for the grading operations, no topographic attenuation or barrier reductions were included.

Off-site Traffic Related Noise

Off-site Project-related roadway segment noise levels were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, December, 1978). The FHWA Model uses the traffic volume, vehicle mix, and speed to compute the equivalent noise level. A spreadsheet calculation was used which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these equivalent noise levels and summing them gives the CNEL for the traffic projections. The noise contours are then established by extrapolating the noise levels until the distance to the desired noise contour(s) are found.

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore, the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiate in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions.

Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas and vegetation. Soft site conditions, based on the existing ground conditions and agricultural use, were used to develop the noise contours and analyze noise impacts along all roadway segments. The future traffic noise model utilizes a typical, conservative vehicle mix of 95% autos, 3% medium trucks and 2% heavy trucks for all analyzed roadway segments. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model.

Based on the County's Guidelines, Project-related roadway noise levels would be considered significant if the future noise level with the Project will be within the "normally acceptable" noise levels shown in the Noise/Land Use Compatibility Guidelines, but will result in an increase of 5 dBA CNEL or greater. Or, if the future noise levels with the Project will be greater than the "normally acceptable" noise levels shown in the Noise/Land Use Compatibility Guidelines, a noise increase of 3 dBA CNEL or greater shall be considered a potentially significant noise impact and mitigation measures must be considered.

Phase 1 (Year 2016) and Phase 2 Construction Traffic Noise Impacts

To determine if roadway noise level increases during the construction of Phase 1 (planned to be constructed in late 2016) and Phase 2 (planned for 2018) of the Project will create noise impacts, the noise levels for the existing conditions were compared with the noise level increase from the Project's peak related construction traffic. The worst-case construction-related noise increases would occur when comparing the existing conditions prior to construction to the beginning of construction. To be conservative, the construction phase's peak traffic volume was utilized. Utilizing the Project's traffic assessment (LOS 2016b) noise contours were developed for the following traffic scenarios:

Existing Year 2016: Current noise conditions without the construction of the Project.

Existing Year 2016 Plus Project Phase 1: Current noise conditions plus the peak construction-related traffic of the Project.

Existing Year 2016 vs. Existing Year 2016 Plus Project Phase 1: Comparison of the Project construction-related traffic noise level increases in the vicinity of the Project site.

Year 2018: Noise conditions without construction of the Project.

Year 2018 Plus Project Phase 2: Noise conditions plus the peak construction-related traffic of the Project.

Year 2018 vs. Year 2018 Plus Project Phase 2: Comparison of Project construction-related traffic noise level increases in the vicinity of the Project site.

Operational Noise

Sound from a small localized source (a "point" source) radiates uniformly outward as it travels away from the source. The sound level attenuates or drops-off at a rate of 6 dBA for each doubling of distance. A drop-off rate of 6 dBA per doubling of distance was used for all operational pieces of equipment. Using a point-source noise prediction model, calculations of the expected operational noise levels and potential impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and any vertical separations, the amount of time the equipment is operating in a given day, also referred to as the duty-cycle and any transmission loss from topography or barriers. To determine the worst-case noise levels for the operations, no topographic attenuation, duty-cycle reductions or barrier reductions were used.

D. PROJECT IMPACTS AND MITIGATION MEASURES

Noise Levels in Excess of Standards/Substantial Temporary Noise Increase

Impact 4.6.1 Heavy equipment and traffic generated during construction would generate short-term increases in noise on and in the vicinity of the Project site. However, based on the number of pieces of equipment and distance to the property line, as well as the low Phase 1 and Phase 2 construction traffic volumes, noise levels would not exceed County standards. Therefore, impacts associated with noise levels in excess of standards or a substantial temporary noise increase as a result of Phase 1 and Phase 2 Project construction are considered **less than significant.**

Construction Noise Impacts

The Phase 1 and Phase 2 Project construction combined are expected last approximately 12 months and includes all site preparation, installation of structures, equipment and supporting utilities. The noise levels used in this analysis for construction are based upon the anticipated list of equipment provided by the Applicant and shown in **Table 4.6-6**. Most of the construction activities will consist of grading the site and the trenching of utilities prior to placement of the structures and batteries. The equipment is anticipated to be spread out over the site with all the equipment located over 800 feet from the same property line.

TABLE 4.6-6
CONSTRUCTION NOISE LEVELS

Construction Equipment	Quantity	Duty Cycle (Hours/Day)	Source Level @ 50-Feet (dBA)	Cumulative Noise Level @ 50-Feet (dBA Leq-8h)
Tractors/Loaders/Backhoes	2	6.5	73	75.1
Water Truck	1	6.5	70	69.1
Crane	2	6.5	75	77.1
Rough Terrain Forklifts	2	1.6	72	68.3
			Cumulative Levels @ 50 Feet (dBA)	79.9
			Distance to Property Line	800
			Noise Reduction Due to Distance	-24.0
			NEAREST PROPERTY LINE NOISE LEVEL	55.9
			County of Imperial Threshold	75
			IMPACT?	**NO**

Source: Ldn 2016c.

As shown in **Table 4.6-6,** if all the equipment was operating in the same location (which is not physically possible), at a distance of 800 feet from the nearest property line, the point source noise attenuation from construction activities is -24 dBA. This would result in an anticipated worst-case eight-hour average combined noise level of well below 75 dBA at the property line. As a result, Phase 1 and Phase 2 construction the noise levels will comply with the County of Imperial's 75 dBA standard at all Project property lines. Therefore, impacts associated with noise levels in excess of standards or a substantial temporary noise increase as a result of project construction are considered **less than significant.**

Off-site Traffic Related Noise Impacts

Phase 1 (Year 2016) Construction Traffic Noise Impacts

Table 4.6-7 shows the noise levels for the Existing Year 2016 Plus Project Construction Traffic Scenario. The noise levels modeled in the table do not take into account any noise barriers or topography that may affect ambient noise levels thus representing a worst-case scenario.

TABLE 4.6-7
EXISTING YEAR 2016 + PROJECT PHASE 1 TRAFFIC NOISE LEVELS

Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 100-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Drew Road				
North of Wixom Road	400	55	57.4	34
South of Wixom Road	341	55	56.7	30
Wixom Road				
From Liebert Road to Drew Road	240	40	52.1	15

Source: Ldn 2016.
[1] LOS Engineering, Inc. 2016.

Table 4.6-8 presents the comparison of the Existing Year 2016 without and with Project Phase 1 traffic-related noise levels. As shown, the overall roadway segment noise levels will increase from 0.1 dBA CNEL to 1.4 dBA CNEL during the construction of the Phase 1 based on the anticipated Project-related construction traffic.

TABLE 4.6-8
EXISTING YEAR 2016 VS. EXISTING YEAR 2016 + PROJECT PHASE 1 TRAFFIC NOISE LEVELS

Roadway Segment	Existing Noise Level @ 100-Feet (dBA CNEL)	Existing Plus Project Noise Level @ 100-Feet (dBA CNEL)	Project Related Noise Increase (dBA CNEL)	County Noise Increase Threshold	Potential Impact?
Drew Road					
North of Wixom Road	52.7	52.9	0.2	5	No
South of Wixom Road	52.1	52.2	0.1	5	No
Wixom Road					
From Liebert Road to Drew Road	46.2	47.6	1.4	5	No

Source: Ldn 2016c.
Note: Sound Levels provided are worst-case and do not take into account topography or shielding from barriers.

As shown in the last column of **Table 4.6-8,** the Project does not create short-term noise increases during the Phase 1 peak construction of more than 5 dBA CNEL on any roadway segment. The noise levels are below the 60 dBA CNEL threshold and in the "normally acceptable" category. No sensitive receptors would be directly impacted by construction traffic noise due to the proposed Project's construction traffic. Decommissioning noise levels are assumed to be similar to construction noise levels. Operational noise levels are discussed under Impact 4.6.3. Therefore, construction noise impacts associated with Phase 1 construction and decommissioning traffic are considered **less than significant.**

Phase 2 (Year 2018) Construction Traffic Noise Impacts

Table 4.6-9 summarizes the noise levels and the distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site in Year 2018 prior to construction of Phase 2. Note that the values given do not take into account any noise barriers or topography that may affect ambient noise levels thus representing a worst-case scenario.

TABLE 4.6-9
YEAR 2018 TRAFFIC NOISE LEVELS (WITHOUT PROJECT)

Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 100-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Drew Road				
North of Wixom Road	402	55	52.9	34
South of Wixom Road	353	55	52.4	31
Wixom Road				
From Liebert Road to Drew Road	184	40	46.4	12

[1] *LOS Engineering, Inc. 2016, Ldn 2016c.*

Table 4.6-10 shows Year 2018 Plus Project Phase 2 (Year 2018) Traffic Noise Levels. Again, note that the values given do not take into account the effect of any noise barriers or topography that may affect ambient noise levels.

TABLE 4.6-10
YEAR 2018 + PROJECT PHASE 2 (YEAR 2018) TRAFFIC NOISE LEVELS

Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 100-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Drew Road				
North of Wixom Road	515	55	54.0	40
South of Wixom Road	366	55	52.5	32
Wixom Road				
From Liebert Road to Drew Road	310	40	48.7	18

[1] *LOS Engineering, Inc. 2016, Ldn 2016c.*

Table 4.6-11 presents the comparison of Year 2018 without and with Project Phase 2 (Year 2018) Traffic Noise Levels. The overall roadway segment noise levels will increase from 0.1 dBA CNEL to 2.3 dBA CNEL during the construction of Phase 2 based on the anticipated Project-related construction traffic.

TABLE 4.6-11
YEAR 2018 VS. YEAR 2018 + PROJECT PHASE 2 TRAFFIC NOISE LEVELS

Roadway Segment	Existing Noise Level @ 100-Feet (dBA CNEL)	Existing Plus Project Noise Level @ 100-Feet (dBA CNEL)	Project Related Noise Level Increase (dBA CNEL)	County Noise Increase Threshold	Potential Impact?
Drew Road					
North of Wixom Road	52.9	54.0	1.1	5	No
South of Wixom Road	52.4	52.5	0.1	5	No
Wixom Road					
From Liebert Road to Drew Road	46.4	48.7	2.3	5	No

Source: Ldn 2016c.
Note: Sound Levels provided are worst-case and do not take into account topography or shielding from barriers.

As shown in the last column of **Table 4.6-11,** the Project does not create a short-term noise increase of more than 5 dBA CNEL on any roadway segment during Phase 2 peak construction. The noise levels are below the 60 dBA CNEL threshold and in the "normally acceptable" category. No sensitive receptors would be directly impacted by Phase 2 construction traffic noise due to the proposed Project's construction traffic. Decommissioning noise levels are assumed to be similar to construction noise levels. Operational noise levels are discussed under Impact 4.6.3. Therefore, construction noise impacts associated with Phase 2 construction and decommissioning traffic are considered **less than significant.**

Exposure to Excessive Groundborne Vibration or Groundborne Noise

Impact 4.6.2 Construction of the proposed Project would result in some groundborne vibration caused by heavy equipment. However, vibration levels would not exceed FTA thresholds and no residential structures are located in the vicinity of the Project to suffer damage or annoyance. Therefore, Project impacts associated with excessive groundborne vibration or groundborne noise are considered **less than significant.**

While Imperial County has not yet adopted vibration criteria, the United States Department of Transportation Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration. For purposes of identifying potential project-related vibration impacts, the FTA criteria is used in this analysis.

The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). Project construction activities would result in PPV levels below the FTA's criteria for vibration induced structural damage. The FTA criterion for infrequent vibration induced annoyance is 80 Vibration Velocity (VdB) for residential uses.

Table 4.6-12 lists the average vibration levels that could be experienced at adjacent land uses from the temporary construction activities. As shown, construction activities would generate levels of vibration that would not exceed the FTA criteria for nuisance for nearby residential uses. In addition, there are no vibration-sensitive uses located adjacent to, or in the vicinity of, the Project site. The nearest offsite uses are agricultural and located over 800 feet from any construction activities. Therefore, project construction activities would not result in vibration induced structural damage or vibration induced annoyance to adjacent land uses. The same would be expected in association with Project decommissioning. No vibration would be generated during Project operations. Therefore, Project impacts associated with excessive groundborne vibration or groundborne noise are considered **less than significant.**

TABLE 4.6-12
VIBRATION LEVELS FROM CONSTRUCTION ACTIVITIES

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS Velocity at 25 Feet (in/sec)	Approximate Velocity Level at 800 Feet (VdB)	Approximate RMS Velocity at 800 Feet (in/sec)
Small bulldozer	58	0.003	12.8	0.0000
Jackhammer	79	0.035	33.8	0.0002
Loaded trucks	86	0.076	40.8	0.0004
Large bulldozer	87	0.089	41.8	0.0005
FTA Criteria			80	0.2
Significant Impact?			**No**	**No**

Source: Ldn 2016c.

Noise Levels in Excess of Standards/Substantial Permanent Noise Increase

Impact 4.6.3 Operational noise would be generated by the HVAC units proposed as part of Phase 1 and Phase 2 of the Battery Energy Storage System. However, the noise levels generated would not exceed the County's Property Line Noise Limits. Therefore, the proposed Project would result in a **less than significant impact** with regard to noise levels in excess of standards or a substantial permanent noise level increase.

Project Operational Noise Impacts

Operation of the battery system does not generate noise. However, operation of HVAC equipment used to cool the batteries would generate noise. Phase 1 will have two 50 ton HVAC units and Phase 2 will have up to eight 50 ton HVAC units for climate control. These HVAC units would have a noise level of 65 dBA at a distance of 7 meters (23 feet) from the manufacturer's enclosure. **Figure 4.6-2** illustrates the proposed location of the HVAC units.

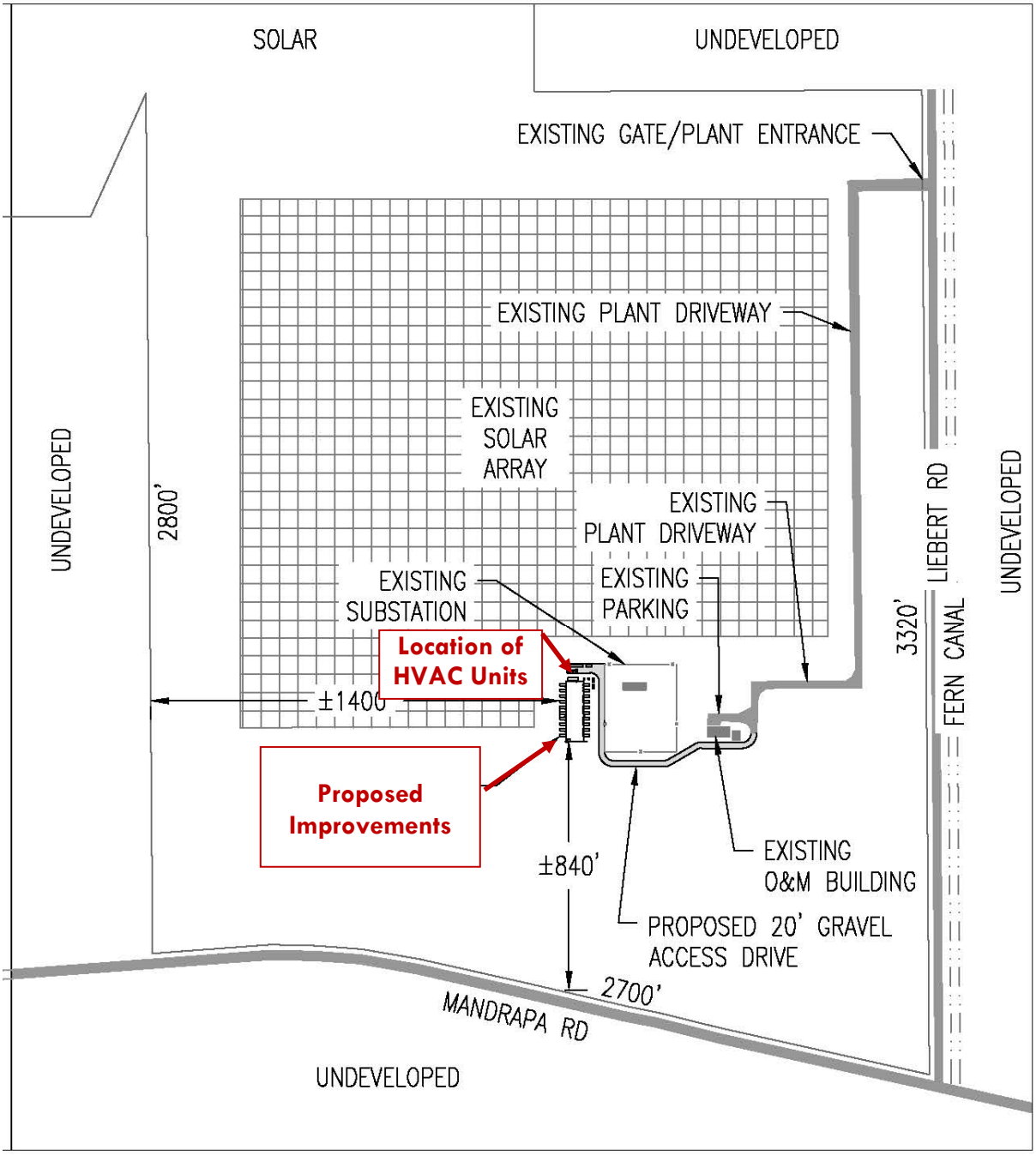
The proposed Project's HVAC units will be located at least 840 feet from the nearest property line to the south (please refer to **Figure 4.6-1** above). As stated above, the HVAC units have a noise level of 65 dBA at a distance of 23 feet. Cumulatively, the ten units would have a combined noise level of 75 dBA at 23 feet. All the units will typically not operate at the same time or for the entire hour. To be conservative, it was assumed all units would operate at the same time. As shown in **Table 4.6-13**, the reduction in the noise level at a distance of 840 feet is -31.3 dBA resulting in a noise level of 43.7 dBA at the nearest property.

TABLE 4.6-13
HVAC NOISE – NEAREST PROPERTY LINE

Source	Cumulative Noise Level @23-Feet (dBA)[1]	Distance to Nearest Property Line (Feet)	Noise Reduction due to distance (dBA)	Resultant Noise Level @ Property Line (dBA Leq)	Property Line Standard (dBA Leq)	Impact?
HVAC	75	840	-31.3	43.7	45	**No**

Source: Ldn 2016c.

Based on the empirical data, manufacturer's specifications and the distances to the property lines the unshielded noise levels from the proposed HVAC units were found to be below the County's most restrictive nighttime Property Line Noise Limit of 45 dBA. Therefore, the proposed Project would result in a **less than significant impact** with regard to noise levels in excess of standards or a substantial permanent noise level increase.



Source: Ldn 2016c.

FIGURE 4.6-2
PROPOSED EQUIPMENT LOCATIONS

4.6.4 CUMULATIVE SETTING, IMPACTS AND MITIGATION MEASURES

A. CUMULATIVE SETTING

The geographic scope for cumulative noise impacts is based on the traffic analysis which examined a total of one intersection and three roadway segments in the study area. The selected intersections and roadway segments and freeway segments were confirmed by County staff and are listed in Tables 4.7-2, Table 4.7-3, 4.7-8, 4.7-9, 4.7-12, 4.7-13, 4.7-14, 4.7-16, 4.6-17, 4.7-18, 4.7-19 and 4.7-20 in Section 4.7, Transportation and Circulation. The cumulative projects are identified Table 3.0-1 in Chapter 3.0, Introduction to the Environmental Analysis and Assumptions Used. Noise levels within the vicinity of the Project site primarily consist of traffic along area roadways.

B. CUMULATIVE METHODOLOGY

Phase 1 (2016) Construction and Cumulative Traffic Noise Impacts

The noise levels for the peak construction period of the Project and other planned and permitted projects were compared with existing Year 2016 conditions. This was done to determine if cumulative off-site noise level increases associated with the peak construction of Phase 1 (planned to begin construction at the end of 2016), in combination with other planned or permitted projects in the vicinity, will create noise impacts. To be conservative, the construction phase's peak traffic volume was utilized. Using the *Campo Verde Battery Storage System County of Imperial (South of I-8 and West of Drew Road) Draft Traffic Impact Analysis* (TIA) (LOS 2016b), noise contours were developed for the following traffic scenarios.

Existing Year 2016 Plus Project Phase 1 Plus Cumulative Projects: Current day noise conditions plus the peak construction period of the Project and other permitted or planned projects.

Existing Year 2016 vs. Existing Year 2016 Plus Project Phase 1 Plus Cumulative: Comparison of the existing noise levels and the related noise level increases from the combination of the proposed Project peak construction traffic and all other planned or permitted projects in the vicinity of the site.

Phase 2 (2018) Construction and Cumulative Traffic Noise Impacts

The noise levels for the peak construction period of the Project and other planned and permitted projects were compared with Year 2018 conditions. This was done to determine if cumulative off-site noise level increases associated with the peak construction of Phase 2 (planned to start and end construction in Year 2018), in combination with other planned or permitted projects in the vicinity, will create noise impacts. To be conservative, the construction phase's peak traffic volume was used in the analysis. Using information from the TIA (LOS 2016b), noise contours were developed for the following traffic scenarios:

Year 2018 Plus Project Phase 1 Plus Cumulative Projects: Current day noise conditions plus the peak construction period of the Project and other permitted or planned projects.

Year 2018 vs. Year 2018 Plus Project Phase 2 Plus Cumulative: Comparison of the existing noise levels and the related noise level increases from the combination of the proposed Project peak construction traffic and all other planned or permitted projects in the vicinity of the site.

The existing noise levels and the distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in **Table 4.6-2** above for the Existing Year 2016 Scenario.

C. CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Project-Related Noise Impacts

Impact 4.6.4 Construction of Phase 1 and Phase 2 of the Battery Energy Storage System would contribute construction traffic to area roadways. However, the increase in traffic noise would be less than cumulatively considerable. The Project would not generate any operational noise, traffic noise or groundborne vibration noise. Decommissioning noise impacts would be similar to those of Project construction. Therefore, cumulative Project-related noise impacts are considered **less than cumulatively considerable**.

Traffic Noise Phase 1

Table 4.6-14 summarizes the cumulative noise conditions for Year 2016 plus Project Phase 1 Plus Cumulative Traffic Noise Levels. No noise barriers or topography that may affect noise levels were incorporated into the calculations to present a worst-case scenario.

TABLE 4.6-14
YEAR 2016 + PROJECT PHASE 1 + CUMULATIVE TRAFFIC NOISE LEVELS

Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 100-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Drew Road				
North of Wixom Road	858	55	56.2	56
South of Wixom Road	759	55	55.7	52
Wixom Road				
From Liebert Road to Drew Road	240	40	47.6	15

[1] *LOS Engineering, Inc. 2016, Ldn 2016c.*

Table 4.6-15 compares Existing Year 2016 and Existing Year 2016 plus Project and Cumulative noise levels.

TABLE 4.6-15
YEAR 2016 VS. 2016 + PROJECT PHASE 1 + CUMULATIVE TRAFFIC NOISE LEVELS

Roadway Segment	Existing 2016 Noise Level @ 100-Feet (dBA CNEL)	2016 Plus Project Plus Cumulative Noise Level @ 100-Feet (dBA CNEL)	Cumulative Related Noise Level Increase (dBA CNEL)	County Noise Increase Threshold	Potential Impact?
Drew Road					
North of Wixom Road	52.9	56.2	3.5	5	No
South of Wixom Road	52.4	55.7	3.6	5	No
Wixom Road					
From Liebert Road to Drew Road	46.4	47.6	1.4	5	No

Ldn 2016c.

Sound Levels provided are worst-case and do not take into account topography or shielding from barriers.

As can be seen in the last column of **Table 4.6-15**, the Project does not create a short-term noise increases during the Phase 1 peak construction of more than 5 dBA CNEL on any roadway segment. All noise levels are below the 60 dBA CNEL threshold and in the "normally acceptable" category. Thus, Phase 1 construction traffic noise would result in a less than cumulative considerable contribution to cumulative traffic noise levels. Likewise, no sensitive receptors would be impacted by cumulative construction traffic noise due to the proposed Project's Phase 1 construction traffic. Therefore, cumulative construction traffic noise during Phase 1 would result in **less than cumulatively considerable** traffic noise impacts.

Traffic Noise Phase 2

The existing noise levels and the distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in **Table 4.6-9** above for the Without Project Year 2018 Scenario. **Table 4.6-16** summarizes Year 2018 Plus Project (Phase 2) Plus Cumulative Traffic Noise Levels. No noise barriers or topography that may affect noise levels were incorporated in the calculations.

TABLE 4.6-16
YEAR 2018 + PROJECT PHASE 2 + CUMULATIVE TRAFFIC NOISE LEVELS

Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 100-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Drew Road				
North of Wixom Road	515	55	54.0	40
South of Wixom Road	366	55	52.5	32
Wixom Road				
From Liebert Road to Drew Road	310	40	48.7	18

Source: Ldn 2016c.
[1] LOS 2016b.

Table 4.6-17 compares Year 2018 to Year 2018 Plus Project Plus Cumulative Traffic Noise Levels.

TABLE 4.6-17
YEAR 2018 VS. YEAR 2018 + PROJECT PHASE 2 + CUMULATIVE TRAFFIC NOISE LEVELS

Roadway Segment	Year 2018 Noise Level @ 100-Feet (dBA CNEL)	Year 2018 Plus Project Plus Cumulative Noise Level @ 100-Feet (dBA CNEL)	Cumulative Related Noise Level Increase (dBA CNEL)	County Noise Increase Threshold	Potential Impact?
Drew Road					
North of Wixom Road	52.9	56.2	3.5	5	No
South of Wixom Road	52.4	55.7	3.6	5	No
Wixom Road					
From Liebert Road to Drew Road	46.4	47.6	1.4	5	No

Source: Ldn 2016c.
Sound Levels provided are worst-case and do not take into account topography or shielding from barriers.

As shown in the last column of **Table 4.6-18**, the Project does not create short-term noise increases during the Phase 2 peak construction of more than 5 dBA CNEL on any roadway segment. All noise levels are below the 60 dBA CNEL threshold and in the "normally acceptable" category. Thus, Phase 2 construction traffic noise would result in a less than cumulatively considerable contribution to cumulative traffic noise levels. Likewise, no sensitive receptors would be impacted by cumulative construction traffic noise due to the proposed Project's Phase 2 construction traffic. Therefore, cumulative construction traffic noise during Phase 2 would result in **less than cumulatively considerable** traffic noise impacts.

Cumulative Operational Traffic Noise

Operations and maintenance of the Battery Energy Storage Facility will be monitored by the six existing operators currently on-site at the Campo Verde Solar Project. No additional full-time employees are proposed to operate the Battery Energy Storage System. Maintenance of the battery internal infrastructure will be infrequent and highly specialized. A focused team will be brought in for maintenance of internal battery infrastructure. Thus, there is no anticipated new on-going trip generation for operation and maintenance of the Battery Energy Storage System. Therefore, the proposed Project's contribution to cumulative noise levels would be less than cumulatively considerable. Likewise, cumulative operational noise would result in a **less than cumulatively considerable impact.**

Cumulative Decommissioning Noise Impacts

It is reasonable to assume that noise impacts from decommissioning activity will be similar to construction noise. Accordingly, the noise contribution of the Battery Energy Storage System during decommissioning is expected to be **less than cumulatively considerable.** Likewise, cumulative decommissioning noise would result in a **less than cumulatively considerable impact.**

Cumulative Groundborne Vibration Impacts

Construction of the proposed Project would result in some groundborne vibration caused by heavy equipment. However, as shown in Table 4.6-12, vibration levels would not exceed FTA thresholds. Furthermore, there are no residential structures located in the vicinity of the Project to suffer damage or annoyance. Therefore, Project construction activities would not result in vibration induced structural damage or vibration induced annoyance to adjacent land uses. The same would be expected in association with Project decommissioning. No vibration would be generated during Project operations. Therefore, the proposed Project's contribution to cumulative groundborne vibration or groundborne noise would be **less than cumulatively considerable.** Likewise, Project impacts associated with excessive groundborne vibration or groundborne noise are considered **less than cumulatively considerable.**

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.