SECTION 4.8

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 reclamation of the proposed Project. The information in this section is based on the Project construction equipment identified in the "Air Pollutant Emission Assessment, Seville 4 Solar Project Construction and Operations, Imperial County, California" memo (EMA 2017c), included in **Appendix D** provided on the attached CD of Technical Appendices of this EIR. Predicted noise levels were calculated utilizing the Federal Highway Administration's Roadway Construction Model (2006) (ECORP 2017c). Modeling outputs can be found in Appendix 4.8-A included in **Appendix H** provided on the attached CD of Technical Appendices of this EIR.

FUNDAMENTALS OF SOUND AND ENVIRONMENTAL NOISE

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. 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 a subjective reaction to different types of sounds. Noise is typically defined as airborne sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. A typical noise environment consists of a base of steady background noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background 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.

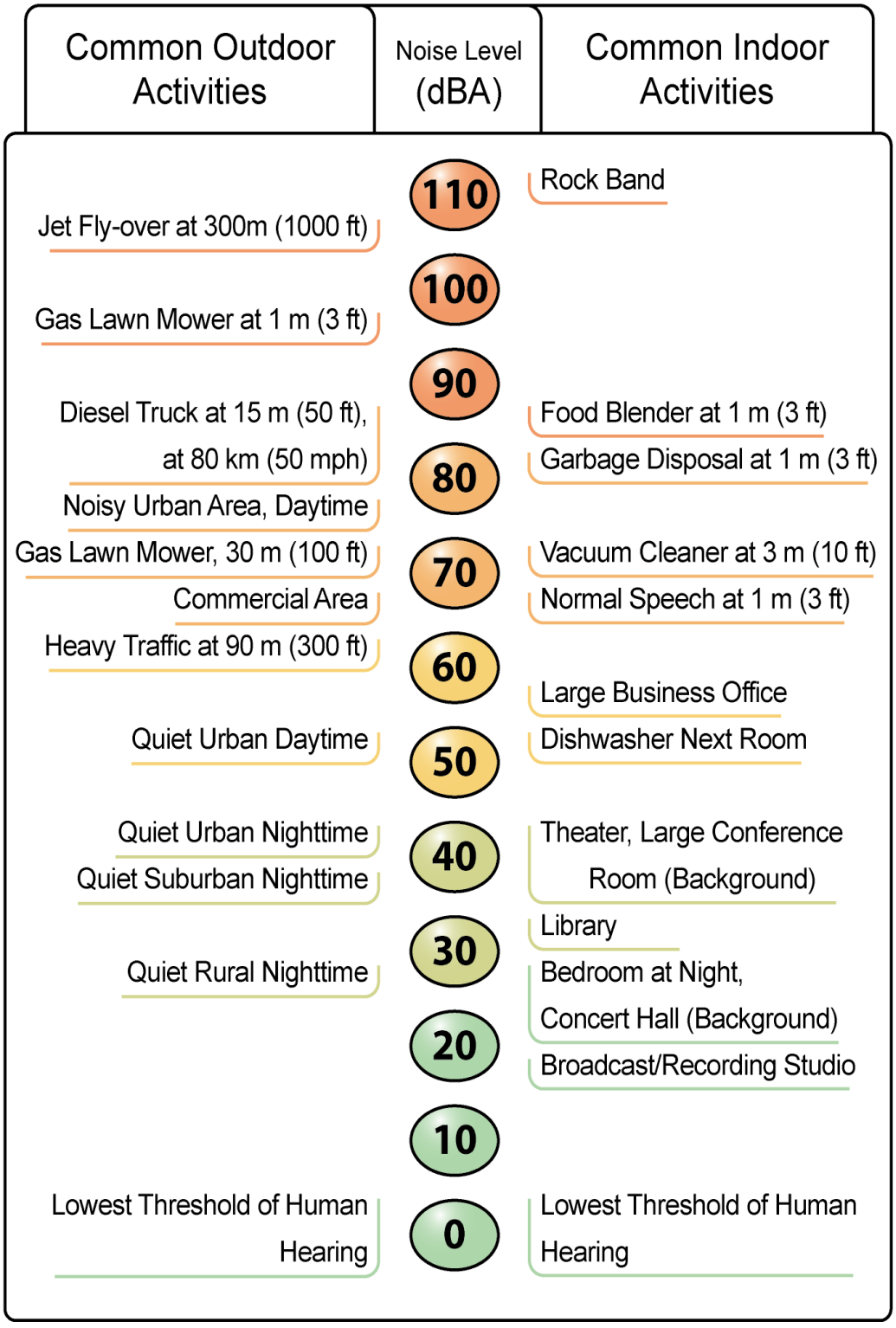
Measuring sound directly in terms of pressure would require a large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel 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.

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 A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

A. ADDITION OF DECIBELS

The decibel 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. 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 (FTA 2006). For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound

pressure by 3 dB). Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB. Typical noise levels associated with common noise sources are depicted in **Figure 4.8-1**.



Source: Caltrans 2012.

FIGURE 4.8-1
COMMON NOISE LEVELS

B. SOUND PROPAGATION AND ATTENUATION

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. 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 (FHWA 2011). 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. Thus, an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed for soft surfaces. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed (FHWA 2011).

Receptors located downwind from a source can be exposed to increased noise levels during windy conditions relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

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 (FHWA 2006). In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. 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.

C. NOISE DESCRIPTORS

The decibel 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 L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined in **Table 4.8-1**.

The A-weighted decibel 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. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

TABLE 4.8-1
COMMON ACOUSTICAL DESCRIPTORS

Descriptor	Definition
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 sound 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.

D. 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 median 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 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. 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 in understanding this analysis:

- 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. For ground vehicles, a noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.

E. FUNDAMENTALS OF ENVIRONMENTAL GROUNDBORNE VIBRATION

Sources of earthborne 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 4.8-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table 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 section (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

F. NOISE-SENSITIVE RECEPTORS

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

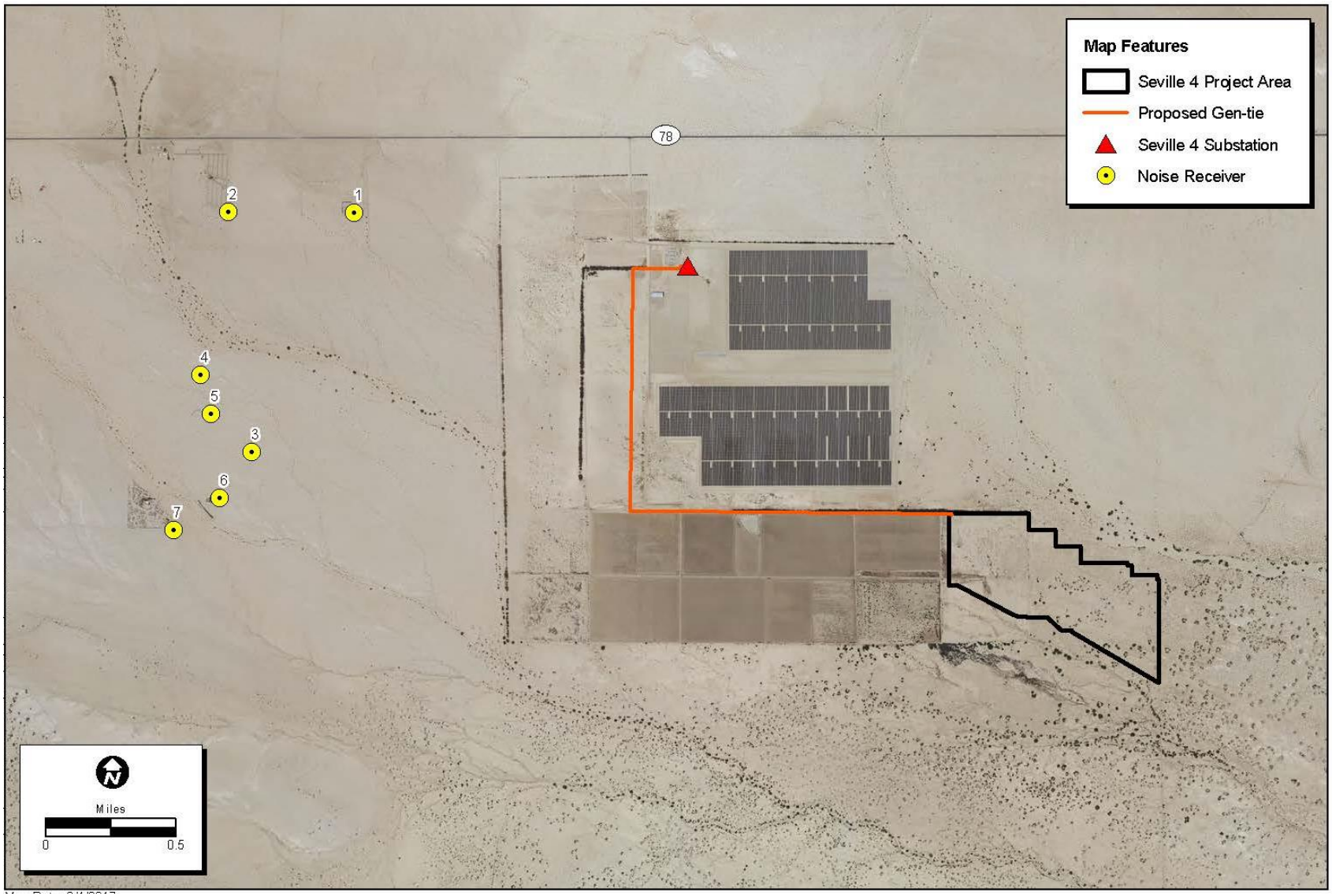
TABLE 4.8-2
HUMAN REACTION AND DAMAGE TO BUILDINGS FOR CONTINUOUS OR FREQUENT INTERMITTENT VIBRATION LEVELS

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: Caltrans 2004.

Nearby noise-sensitive land uses consist predominantly of rural residential land uses, generally located west of the Project area. These receptors were previously identified as part of the Seville Solar Farm Complex EIR (SCH. No. 2013091039). The nearest sensitive receptor that could be affected by the Project is a residence located approximately 0.9 miles west of the western boundary of the construction site footprint (i.e., location of gen-tie construction 1.5 miles northwest of the Project site). This same residence (Noise Receiver #1) is also the nearest residence to the proposed solar energy generating facility, located approximately 2.5 miles to the west-northwest (Noise Receivers #6 and #7 are also located approximately 2.5 west of the solar energy generating facility). Refer to **Figure 4.8-2** for the locations of all Project vicinity sensitive receptors.

THIS PAGE INTENTIONALLY LEFT BLANK.



Source: ECORP 2017c.

FIGURE 4.8-2
NOISE RECEPTORS IN THE VICINITY OF THE PROJECT

4.8.1 REGULATORY FRAMEWORK

A. FEDERAL

Occupational Safety and Health Act of 1970

The Federal Occupational Safety and Health Administration (OSHA) regulates on-site 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 and testing employees for hearing loss on a periodic basis.

B. STATE

State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The *State of California General Plan Guidelines* (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order 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.

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 4.8-3** summarizes the Project's consistency with the applicable General Plan noise policies. While this EIR 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 4.8-3
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Goals, Objectives, Policies and/or Programs	Consistent with General Plan?	Analysis
NOISE ELEMENT		
Project/Land Use Planning		
Goal 2: Review proposed Projects for noise impacts and require design which will provide acceptable indoor and outdoor noise environments.	Yes	A Roadway Construction Noise Model (RCNM) was prepared which examined the effects of construction noise generated by the proposed Project. The findings are discussed in the impact analysis included in this section. Therefore, the proposed Project is consistent with this goal.

TABLE 4.8-3
IMPERIAL COUNTY GENERAL PLAN CONSISTENCY ANALYSIS

General Plan Goals, Objectives, Policies and/or Programs	Consistent with General Plan?	Analysis
Objective 2.2 Provide acoustical analysis guidelines which minimize the burden on project proponents and project reviewers.	Yes	The County of Imperial Noise Element includes noise standards by which projects are assessed. The proposed Project was analyzed using these standards and found to be below established noise thresholds with regard to short-term construction and long-term traffic noise and long-term operational noise. Therefore, the proposed Project is consistent with this objective.
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	Long-term operational noise impacts of the proposed Project were found to be below County property line noise standards. Therefore, the proposed Project is consistent with Program and Policy 2.
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 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, including reduction of the intensity of the proposed Project, construction of noise attenuation walls and/or landscaped earth berms, or other changes in project design or its proposed access. For non-residential projects, reduced hours of operation may also be required.	Yes	Long-term traffic noise (refer to Impact 4.8.3) was analyzed for the proposed Project and determined to be less than significant with no mitigation required. Therefore, the proposed Project is consistent with Program and Policy 6.

Land Use Compatibility Noise Criteria

The Noise Element of the County's General Plan identifies goals, objectives, and policies and programs to reduce noise-related impacts and land use compatibility conflicts. For determination of land use compatibility, the Noise Element identifies noise criteria for various land-use designations based on the average-daily noise descriptor (i.e., CNEL). **Table 4.8-4** summarizes the County of Imperial's land use compatibility noise standards.

TABLE 4.8-4
COUNTY OF IMPERIAL LAND USE COMPATIBILITY NOISE CRITERIA

Land Use Category	Average-Daily Noise Level (dBA CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential	<60	60-70	70-75	>75
Transient Lodging-Motels, Hotels	<60	60-75	70-80	>80
Schools, Libraries, Churches, Hospitals, Nursing Homes	<60	60-70	70-80	>80
Auditoriums, Concert Halls, Amphitheaters	--	<70	--	>70
Sports Arena, Outdoor Spectator Sports	--	<70	70-75	>75
Playgrounds, Neighborhood Parks	<70	--	70-75	>75
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<70	--	70-80	>80
Office Buildings, Business Commercial and Professional	<65	65-75	75-80	>80
Industrial, Manufacturing, Utilities, Agriculture	<70	70-75	75-80	>80

Source: Imperial County 2015.

Notes:
***Normally Acceptable**: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.*
***Conditionally Acceptable**: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.*
***Normally Unacceptable**: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.*
***Clearly Unacceptable**: New construction or development clearly should not be undertaken.*

Property Line Noise Standards

The County of Imperial General Plan also establishes maximum allowable average-hourly noise limits for various land use designations (refer to **Table 4.8-5**). These noise standards are to be applied at the property line of the noise-generating land use. In instances where the adjoining land use designations differ from that of the noise-generating land use, the more restrictive noise standard shall apply. Where 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 dBA L_{eq}. It is important to note that these standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. These standards do not apply to construction noise.

TABLE 4.8-5
COUNTY OF IMPERIAL PROPERTY LINE NOISE STANDARDS

Land Use Zone	Time Period	Average-Hourly Noise Level (dBA L_{eq})
Residential	7 a.m. - 10 p.m. 10 p.m. - 7 a.m.	50 45
Multi-residential	7 a.m. - 10 p.m. 10 p.m. - 7 a.m.	55 50
Commercial	7 a.m. -10 p.m. 10 p.m. - 7 a.m.	60 55
Light Industrial/Industrial Park	Any time	70
General Industrial	Any time	75

Source: Imperial County 2015.
Notes: 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 dBA Leq.

Construction Noise Standards

The County of Imperial General Plan Noise Element also establishes noise limitations pertaining to construction-related activities. Per the requirements of the Noise Element, construction noise from a single piece of equipment or a combination of equipment shall not exceed 75 dBA 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 dBA Leq when averaged over a one (1) hour period. Construction equipment operation shall be limited to the hours of 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 5 p.m. Saturday. No commercial construction operations are permitted on Sunday or holidays. In cases of a person constructing or modifying a residence for himself/herself, and if the work is not being performed as a business, construction equipment operations may be performed on Sundays and holidays between the hours of 9 a.m. and 5 p.m. Such non-commercial construction activities may be further restricted where disturbing, excessive, or offensive noise causes discomfort or annoyance to reasonable persons of normal sensitivity residing in an area.

Significant Increase of Ambient Noise Levels

The County of Imperial General Plan Noise Element also establishes guidelines for the evaluation of project-generated increases in ambient noise levels. Projects resulting in increases in ambient noise levels, as identified below, would typically be considered to have a potentially significant noise impact (Imperial County 2015):

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.

County of Imperial Noise Abatement and Control Ordinance

The County of Imperial Noise Abatement and Control Ordinance (Title 9, Division 7) identifies property line noise limitations that are consistent with those identified in the County of Imperial General Plan Noise Element (refer to **Table 4.8-4**). As noted above, the noise limits are applied at the property line of the noise-generating land use. In instances where the adjoining land use designations differ from that of the noise-generating land use, the more restrictive noise standard shall apply (Imperial County 2017a).

Groundborne Vibration

There are no federal, state, or local regulatory standards for ground-borne vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, the California Department of Transportation (Caltrans) has developed vibration criteria based on potential structural damage risks and human annoyance.

At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely result in structural damage. For most structures, a PPV threshold of 0.5 inches per second is sufficient to avoid structure damage, with the exception of fragile historic structures or ruins. For the protection of fragile, historic, and residential structures, Caltrans recommends a more conservative threshold of 0.2 inches per second PPV. This same threshold would represent the level at which vibrations would be potentially annoying to people in buildings.

4.8.2 ENVIRONMENTAL SETTING

A. SEVILLE 4 SOLAR PROJECT

Nearby noise-sensitive land uses consist predominantly of rural residential land uses, generally located west of the project site. The nearest sensitive receptor to the Project site is a residence located approximately 0.9 miles west of the western boundary of the construction site footprint (i.e., location of gen-tie construction). This same residence is also the nearest residence to the proposed solar energy generating facility, at approximately 2.5 miles to the west. The proposed Seville 4 Substation would be located approximately 1.1 miles from this residence.

Ambient Noise Environment

The noise environment in the proposed Project area is defined primarily by vehicular traffic on SR 78. To a lesser extent, occasional aircraft overflights also contribute on to ambient noise levels in the Project area. No major commercial noise sources were identified within the Project area. **Table 4.8-6** summarizes calculated existing traffic noise levels and distances to existing average-daily noise contours (in CNEL) for SR 78.

TABLE 4.8-6
EXISTING TRAFFIC NOISE LEVELS

Roadway	CNEL at 50 Feet from Near-Travel-Lane Centerline[1]	CNEL at 100 Feet from Near-Travel-Lane Centerline[1]	CNEL at 500 Feet from Near-Travel-Lane Centerline[1]	CNEL at 1,000 Feet from Near-Travel-Lane Centerline[1]
SR 78	56.9	52.3	41.8	37.3

Source: Traffic noise levels were calculated using the Federal Highway Administration's roadway noise prediction model.

Existing traffic noise levels at the nearest residence to Project construction site footprint (i.e., location of gen-tie construction) is approximately 35.6 dBA.

In 2013 (September 18 and 19), seven short-term ambient noise measurements and one long-term (24-hour) noise measurement was conducted in the Project vicinity as part of the *Seville Solar Farm Complex*

Draft Environmental Impact Report prepared by Imperial County (2014). Since 2013, there has been no land use development in the Project vicinity. Furthermore, daily traffic counts on SR 78 have remained static (Caltrans 2016). Therefore, the noise measurements taken in 2013 are still applicable to characterizing the existing ambient noise environment. These noise measurements were conducted using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter positioned at a height of approximately 5 feet above ground level (Imperial County 2014). **Table 4.8-7** summarizes measured off-site ambient noise levels.

TABLE 4.8-7
SUMMARY OF MEASURED OFF-SITE AMBIENT NOISE LEVELS

Location	Monitoring Period		Noise Levels (dBA)		
	Start Date & Time	Duration	L_{eq}	L_{max}	CNEL
M1: Blu In Café, Approximately 50 feet from SR 78 Centerline	09/18/13, 13:30 p.m.	15 minutes	62.3	80.9	--
	09/19/13, 10:07 a.m.	18 minutes	62.7	81.6	--
M2: SR 78, Approximately 95 feet from Road Centerline	09/18/13, 15:30 p.m.	30 minutes	55.3	74.0	--
	09/19/13, 8:00 a.m.	60 minutes	59.1	78.1	--
	09/19/13, 9:00 a.m.	60 minutes	58.2	77.4	--
M3: SR 78, Approximately 85 feet from Road Centerline	09/19/13, 6:30 a.m.	15 minutes	59.2	77.8	--
	09/19/13, 10:40 a.m.	15 minutes	58.4	78.5	--
	09/18/13-09/19/13	24 hours	--	--	61

Source: Imperial County 2014.

The noise environment in the Project area is also characterized by existing solar energy generating facilities (Seville 1 Solar and Seville 2 Solar), including an existing substation, electrical transmissions lines, and power conversion station. Transformer noise, associated with the existing substation, is typically described as a "humming" or "buzzing" noise which is caused by mechanical movement of the laminations located within the transformer core. Expansion of the core laminations occurs when the transformer is under load. When the transformer is not under load the core laminations return to their original state. Because movement of the core laminations occurs during both load and non-load conditions, transformers typically generate audible noise under both load and non-load conditions. During non-load conditions, the highest audible noise levels are typically approximately 2 dB less than noise generated while under load. The current operational noise levels associated with the existing substation transformers is approximately 70 dBA at a distance of 3 feet, while under load (Imperial County 2014).

One of the phenomena associated with high-voltage transmission lines, is Corona discharge. Corona is the electrical breakdown of the air into charged particles, which may result in audible noise. During Corona activity, the existing transmission lines to the northwest of the Project site sometimes generate a small amount of sound energy. Audible noise generated by Corona discharge is typically described as a crackling or humming sound. Audible Corona noise levels for a typical 230-kV line are approximately 25 dBA at locations within approximately 25 feet of the power line corridor (Imperial County 2014).

The existing power conversion station (PCS), located to the northwest of the Project site, includes two inverters and one transformer. The inverters are housed within an enclosed structure that assists to reduce operational noise from the inverters. The transformer is located at the exterior of the PCS enclosure. This PCS operates only during the daytime hours along with inverters, a transformer, and other mechanical equipment. The combined operational noise levels associated with the existing PCS is approximately 70 dBA L_{eq} at a distance of 10 feet (Imperial County 2014).

4.8.3 IMPACTS AND MITIGATION MEASURES

A. STANDARDS OF SIGNIFICANCE

Criteria for determining the significance of noise impacts were developed based on information contained in the CEQA Guidelines Appendix G. According to the guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or of 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 area or, where such a plan has not been adopted, within two miles of a public airport or a 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.

For purposes of this analysis and where applicable, the County of Imperial noise standards were used for evaluation of Project-related noise impacts. Thresholds of significance used in this analysis are discussed under each specific impact discussion.

B. ISSUES NOT ANALYZED

The Project is not located within two miles of a public airport or private airstrip. The nearest airport is the Ocotillo Airport, which is located approximately 6.75 miles northwest of the solar farm complex site. As a result, the Project site is not subject to high levels of aircraft noise. Implementation of the proposed Project would not affect airport operations nor result in increased exposure of noise-sensitive receptors to aircraft noise. For these reasons, exposure to aircraft noise levels would be considered less than significant and is not discussed further in this EIR.

C. METHODOLOGY

A combination of existing literature, noise level measurements, and accepted noise prediction and sound propagation algorithms were used to: 1) predict short-term construction noise levels; 2) predict long-term non-transportation noise levels; 3) predict long-term transportation source noise levels; and 4) evaluate groundborne vibration impacts.

Short-Term Construction Noise

Predicted noise levels at nearby noise-sensitive land uses were calculated utilizing typical noise levels and usage rates associated with construction equipment derived from the U.S. Department of Transportation, Federal Highway Administration's (FHWA's) *Roadway Construction Noise Model* (version 1.1) and representative data obtained from construction of similar projects. Modeling assumptions and calculations (ECORP 2017c) are provided in Appendix 4.8-A included in **Appendix H** provided on the attached CD of Technical Appendices of this EIR.

Long-term Operational Stationary-Source Noise

Predicted noise levels associated with on-site stationary noise sources and activities were calculated based on representative data obtained from existing literature and noise assessments prepared for similar projects. Operational noise levels were predicted assuming an average noise attenuation rate of 6 dB per doubling of distance from the source and an excess noise attenuation rate of 1.5 dB per 1,000 feet. Operational noise levels were calculated at the Project property lines and nearby land uses for comparison to the County noise standards. Modeling assumptions and calculations are provided in Appendix 4.8-A (ECORP 2017c) included in **Appendix H** provided on the attached CD of Technical Appendices of this EIR.

Long-term Traffic Noise

The proposed Project is not expected to have a regular on-site staff based at the Project site. Workers may occasionally be required to maintain the common access roads, and stormwater retention basin(s), clean the solar panels, and/or perform specific maintenance activities (e.g. weed abatement). If necessary, dust may be controlled during operations by the periodic application and maintenance of soil binders to exposed soil surfaces. On-site staff would access the Project site via SR 78. According to Caltrans' *2015 Traffic Volumes* (Caltrans 2016), the segment of SR 78 traversing the Project site accommodates an average of 780 vehicle trips daily. According to the 2013 California Department of Transportation (Caltrans) *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, doubling of traffic on a roadway would result in an increase of 3 dB (a barely perceptible increase). The Project's irregular daily trips would be nominal compared to the vehicle trips currently experienced on SR 78, and thus, would not result in a perceptible increase traffic noise levels.

Groundborne Vibration

No major existing sources of groundborne vibration have been identified in the proposed Project area. Groundborne vibration levels associated with construction-related activities were evaluated utilizing typical groundborne vibration levels rates associated with construction equipment obtained from the U.S. Department of Transportation, Federal Transit Administration's *Transit Noise and Vibration Impact Assessment Guidelines* (FTA 2006). Groundborne vibration impacts related to structural damage and human annoyance were evaluated taking into account the distance from construction activities to nearby land uses and the criteria typically applied for structural damage and human annoyance.

D. Project Impacts and Mitigation Measures

Noise Levels in Excess of Standards/Substantial Temporary Noise Increase

Impact 4.8.1 Activities associated with construction would increase short-term noise levels on the Project site and in the vicinity of the Project area. However, no County of Imperial noise standards would be exceeded during construction. Therefore, a **less than significant** impact would occur in association with temporary noise increases.

Short-Term Construction-Generated Noise

Construction noise associated with the proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for on-site construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could residences in the vicinity of the construction site. Refer to **Figure 4.8-2** for the locations of all Project vicinity sensitive receptors. At the nearest, Project construction

(associated with the proposed Gen-tie) would occur approximately 0.9 mile from Noise Receiver #1. Construction of the substation would occur approximately 1.1 miles from this same residence. However, it is acknowledged that construction activities would occur over the entirety of the Project site and would not be concentrated at the point closest to the sensitive receptors.

The specific equipment types that would be used during construction were obtained from construction equipment identified in the "Air Pollutant Emission Assessment, Seville 4 Solar Project Construction and Operations, Imperial County, California" memo (EMA 2017c), provided in included in **Appendix D** provided on the attached CD of Technical Appendices of this EIR. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings.

Other primary sources of acoustical disturbance would be random incidents which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). These estimations of noise levels take into account the distance to the receptor, attenuation from molecular absorption, and anomalous excess attenuation. During these activities, exterior noise levels could affect sensitive receptors in the Project vicinity.

Development of the Project would involve the construction of an access road, site grading and fence construction, racking facility installation, gen-tie line construction, substation construction, solar panel installation, system wiring and site trenching, and inverter facility installation.

Construction periods for several of these activities are expected to overlap. Specifically, proposed racking facility installation, gen-tie line construction, substation construction, and solar panel installation. Similarly, proposed substation construction, racking facility installation, solar panel installation, system wiring and site trenching, and inverter facility installation would also overlap.

Short-term construction noise impacts would be considered significant if the proposed Project would exceed applicable County noise standards. Per the requirements of the Noise Element, construction noise, from a single piece of equipment or a combination of equipment, shall not exceed 75 dBA 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.

Additionally, construction noise would be considered significant if it occurs outside of the hours of 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 5 p.m. Saturday, or on Sunday or holidays.

In order to estimate the worst-case construction noise levels that may occur at a noise-sensitive receptor, the combined construction equipment noise levels were calculated for all the phases of Project construction, accounting for overlapping phases. **Table 4.8-8** summarizes the anticipated short-term construction noise levels generated during Project construction. As depicted shown, vicinity residential land uses could be exposed to temporary and intermittent noise levels of 51.4 dBA at the loudest, which is below the County construction noise standard of 75 dBA.

TABLE 4.8-8
SUMMARY OF ESTIMATED ON-SITE CONSTRUCTION NOISE LEVELS

Receivers	Nearest Distance (feet)	Construction Activities	Estimated Exterior Construction Noise Level	Exceed County Construction Noise Standard?
1	5,200	Access Road Construction	41.6	No
		Grading / Fence Construction	49.1	
		Racking, Gen-Tie, Substation, Solar Panel Installation	51.4	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	51.3	
2	7,700	Access Road Construction	38.2	No
		Grading / Fence Construction	45.6	
		Racking, Gen-Tie, Substation, Solar Panel Installation	48.0	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	47.9	
3	7,000	Access Road Construction	39.0	No
		Grading / Fence Construction	46.5	
		Racking, Gen-Tie, Substation, Solar Panel Installation	48.8	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	48.7	
4	8,020	Access Road Construction	37.9	No
		Grading / Fence Construction	45.3	
		Racking, Gen-Tie, Substation, Solar Panel Installation	47.6	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	47.6	
5	7,870	Access Road Construction	38.0	No
		Grading / Fence Construction	45.5	
		Racking, Gen-Tie, Substation, Solar Panel Installation	47.8	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	47.7	

TABLE 4.8-8
SUMMARY OF ESTIMATED ON-SITE CONSTRUCTION NOISE LEVELS

Receivers	Nearest Distance (feet)	Construction Activities	Estimated Exterior Construction Noise Level	Exceed County Construction Noise Standard?
6	7,700	Access Road Construction	38.2	No
		Grading / Fence Construction	45.6	
		Racking, Gen-Tie, Substation, Solar Panel Installation	48.0	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	47.9	
7	8,660	Access Road Construction	37.2	No
		Grading / Fence Construction	44.6	
		Racking, Gen-Tie, Substation, Solar Panel Installation	47.0	
		Racking, Solar Panel Installation, Wiring & Trenching, Inverter Installation	46.9	

Source: Federal Highway Administration Roadway Construction Noise Model (2006).
See Appendix 4.8-A included in **Appendix D** for model outputs.
Notes: [1] Based on estimated construction equipment derived from the air quality analysis prepared for this project (see **Appendix D**)

As noted above, predicted noise levels associated with the various on-site construction activities would not exceed the County of Imperial noise standards. As previously identified, Imperial County establishes noise limitations pertaining to construction-related activities. Specifically, construction equipment operations are limited to the hours of 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 5 p.m. Saturday. No commercial construction operations are permitted on Sunday or holidays. For these reasons, impacts associated with noise from on-site construction activities are considered **less than significant**.

Construction Vehicle Traffic

Construction generated vehicle traffic would include a mix of light-duty automobiles and trucks, medium-duty trucks, and heavy-duty trucks. According to Chapter 2.0, Project Description, approximately 136 construction worker vehicles and 17 haul trucks would arrive at, and depart from, the Project site daily. **Table 4.8-9** summarizes predicted traffic noise levels for area roadways with and without the contribution of construction-generated vehicle traffic associated with the proposed Project.

TABLE 4.8-9
PREDICTED SHORT-TERM INCREASES IN TRAFFIC NOISE LEVELS

Roadway	CNEL/L_{dn} at 50 Feet from Near-Travel-Lane Centerline		Predicted Increase	Substantial Increase?*
	Without Project	With Project		
SR 78	56.9	58.2	1.3	No

Source: Traffic noise levels were calculated using the Federal Highway Administration's roadway noise prediction model.
**For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 5.0, or greater, where the noise levels, without Project implementation, are less than the County's "normally acceptable" noise standard. Where the noise level, without project implementation, equals or exceeds applicable noise standards, an increase of 3.0 dBA, or greater, would be considered a substantial increase. These criteria are intended to apply to long-term project operation, but are used in this analysis in the absence of applicable criteria for short-term activities.*

As indicated, construction activities would not result in a substantial increase (i.e. only 1.3 CNEL L_{dn}) in average-daily vehicle traffic noise levels along area roadways. For these reasons, impacts associated with short-term noise from construction vehicle traffic are considered **less than significant**.

Operation

Once the Project is operational, no construction activities or construction vehicle traffic are anticipated to be generated. The amount of activity and vehicle trips associated with maintenance would be substantially less than occurs during construction. Operational noise is discussed as part of Impact 4.8-3 and Impact 4.8-4, below.

Reclamation

Activities associated with reclamation include concrete removal; removal and dismantling of underground utilities; excavation and removal of soil; and final site contour. All equipment and facilities at the solar generation facility would be removed basically in reverse order of the manner in which installation occurred. Reclamation activities would likely generate noise levels similar to those occurring during construction and are likewise considered **less than significant**. After the Project site is cleared and contoured, it would be reclaimed to reclaimed to its end state to approximate the existing desert lands or idle farmland and is not anticipated to include any noise generating activities that would exceed county standards.

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.

Exposure to Groundborne Vibration

Impact 4.8.2 Ground-borne vibration levels associated with short-term Project construction and long-term operational activities would not exceed applicable groundborne vibration criterion at nearby land uses. This impact would be considered **less than significant.**

Construction & Reclamation

Increases in groundborne vibration levels attributable to the proposed Project would primarily be associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. This analysis of the proposed Project uses the Caltrans recommended standard of 0.2 inches per second peak particle velocity with respect to the prevention of structural damage for normal buildings. This is also the level at which vibrations may begin to annoy people in buildings. Therefore, groundborne vibration levels would be considered significant if predicted short-term construction or long-term operational groundborne vibration levels attributable to the proposed Project would exceed 0.2 inches per second PPV at the nearest offsite existing structure. **Table 4.8-10** summarizes groundborne vibration levels associated with representative construction equipment**.**

TABLE 4.8-10
REPRESENTATIVE VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment Type	Peak Particle Velocity at 20 Feet (inches per second)
Large Bulldozer	0.123
Caisson Drilling	0.123
Loaded Trucks	0.105
Rock Breaker	0.082
Jackhammer	0.048
Small Bulldozer/Tractor	0.004

Source: FTA 2006; Caltrans 2004.

The nearest off-site structure to the Project site (associated with Noise Receiver #1) is over 0.9 mile from the construction site boundary. Based on the vibration levels presented in **Table 4.8-9**, ground vibration generated by heavy-duty equipment would not be anticipated to exceed approximately 0.123 in/sec PPV at 20 feet. Therefore, the use of virtually any type of construction equipment would not result in a groundborne vibration velocity level above 0.2 in/sec and predicted vibration levels at the nearest off-site structures. As a result, groundborne vibration impacts would be considered **less than significant** during Project construction.

Operation

Long-term operational activities associated with the proposed Project would not involve the use of any equipment or processes that would result in potentially significant levels of groundborne vibration. Thus, groundborne vibration impacts would be considered **less than significant** during operation of the proposed Project.

Mitigation Measures

None required.

Significance After Mitigation

Not Applicable.

Long-Term Exposure to Increased Traffic Noise

Impact 4.8.3 Long-term operation of the proposed Project would not result in a substantial increase in traffic noise levels. This impact would be considered **less than significant.**

Construction

Construction activities would occur for a limited duration prior to Project operation. Refer to the discussion of construction noise under Impact 4.8-1, above.

Operation

Long-term operational noise impacts would be considered significant if the proposed Project would result in a substantial increase in ambient noise levels that would exceed the County noise standards for land use compatibility (refer to **Table 4.8-3**). For assessment of transportation impacts, a substantial increase in noise levels is typically defined as an increase of 5.0 dB or greater where the noise levels without project implementation are less than the applicable noise standard. Where the noise level without project

implementation equals or exceeds applicable noise standards, an increase of 3.0 dBA, or greater, would be considered a substantial increase. As previously described, the nearest sensitive receptor that could be affected by the Project is a residence located approximately 0.9 miles west of the western boundary of the construction site footprint (i.e., location of gen-tie construction 1.5 miles northwest of the Project site). This same residence (Noise Receiver #1) is also the nearest residence to the proposed solar energy generating facility, located approximately 2.5 miles to the west-northwest. Existing noise levels at this nearest residence, predominately from traffic, is approximately 35.6 dBA CNEL. Therefore, exterior noise levels at this nearest existing residential land use is currently experiencing noise levels below the County's "normally acceptable" noise standard of 55 dBA CNEL. As a result, a substantial increase in noise levels at these locations would typically be defined as an increase of 5.0 dB or greater.

The proposed Project is not expected to have a regular on-site staff based at the Project site. Workers may occasionally be required to maintain the common access roads, and stormwater retention basin(s), clean the solar panels, and/or perform specific maintenance activities (e.g. weed abatement). On-site staff would access the Project site via SR 78. According to Caltrans' *2015 Traffic Volumes* (Caltrans 2016), the segment of SR 78 traversing the Project site accommodates an average of 780 vehicle trips daily. According to the 2013 California Department of Transportation (Caltrans) *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, doubling of traffic on a roadway would result in an increase of 3 dB (a barely perceptible increase). The Project's irregular daily trips would be nominal compared to the vehicle trips currently experienced on SR 78, and thus, would not result in a perceptible increase traffic noise levels. As a result, less than significant impacts would occur with regard to long-term exposure to increased traffic noise during Project operations.

Reclamation

After the Project site is cleared and contoured, it would be reclaimed to its end state to approximate the existing desert lands or idle farmland. No long-term exposure to increased traffic noise would be generated in association with reclaiming the Project site to idle farmland. As a result, **less than significant** impacts with regard to long-term exposure to increased traffic noise during reclamation.

Mitigation Measures

None required.

Significance After Mitigation

Not Applicable.

Long-Term Exposure to Increased Stationary-Source Noise

Impact 4.8.4 Long-term operation of the proposed Project is not anticipated to exceed applicable noise standards at the Project site's property line. Therefore, long-term exposure to increased stationary-source noise is considered a **less than significant impact.**

The proposed Project would operate continuously, seven days per week. Noise generated by Project operations would be associated with the on-site transformers, inverters, and substation, and power conversion stations (PCSs). The Project would be equipped with either Fixed-Frame PV module arrays or horizontal single-axis tracker (HSAT) systems to orient the solar panels toward the sun. Operation of the electrical motors used to power the HSATs would generate intermittent noise. In addition, given the low background noise levels, Corona discharge may be somewhat detectable in the immediate vicinity of the proposed solar development Gen-tie Line. Other operational noise sources would include on-site vehicle operations and intermittent maintenance activities.

Long-term operational noise impacts would be considered significant if the proposed Project would result in non-transportation noise levels that would exceed applicable County noise standards at nearby noise-sensitive land uses. **Table 4.8-4**, above, summarizes the County of Imperial noise limitations for stationary sources. When the ambient noise level is equal to or exceeds the Property Line noise standard, the applicable noise standard is the ambient noise level (in dBA Leq) plus 3 dB. In instances where the adjoining land use designations differs from that of the noise-generating land use, the more restrictive noise standard shall apply (Imperial County 2015).

Based on the nature of the Project, the "General Industrial" land use designation, as identified in **Table 4.8-3** above, is considered most closely representative of the proposed land use (i.e. a solar farm). As a result, Project-generated noise levels that would exceed 75 dBA Leq at the property line Project site would be considered to have a potentially significant impact. To ensure a conservative analysis, irrespective of existing zoning designation, operational noise levels that would exceed the County's applicable daytime and nighttime noise standards at the nearest residential land use (i.e., 50 and 45 dBA L_{eq}) would also be considered to have a potentially significant impact. This more conservative noise standard is used to ensure that occupants of these existing dwelling units are adequately protected from Project-generated operational noise levels.

Representative noise levels for on-site stationary noise sources were obtained from noise studies and measurement data obtained from similar solar generation projects and related equipment. **Table 4.8-11** summarizes representative operational noise levels for on-site noise sources.

TABLE 4.8-11
SUMMARY OF ON-SITE STATIONARY EQUIPMENT NOISE LEVELS

Source	Distance (feet)	Noise Level (dBA L_{eq})
Substation Transformer Noise Levels	3	70
Power Conversion Stations (PCS)	10	70
Transmission Line Corona Discharge	25	25
Horizontal Single-Axis Tracker (HSAT) Systems	400	37
On-site Maintenance	50	70

Source: Imperial County 2014
Notes:
[1] *Transmission Line Corona Discharge is conservatively based on a 230-kV line. Corona discharge noise generated by lower-rated lines would be less.*
[2] *Assumes 70 dBA L_{eq} at 50 feet based on typical operational noise levels for portable equipment (e.g., portable generators and compressors) (FTA 2006).*

Noise generated by other on-site sources, including the HSAT systems, gen-tie lines, and vehicles would not be projected to exceed applicable noise standards. Likewise, these sources would not result in a detectable increase in ambient noise levels at the nearest existing noise-sensitive receptors, located more than 0.9 mile distant. As previously described on page 4.8-3 of this Section, 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 source. As a result, activities such as on-site maintenance, which produce noise levels of 70 dBA at 50 feet, would result in noise levels below 30 dBA at the nearest sensitive receptor. This noise level is well below the County's applicable daytime and nighttime noise standards (i.e., 50 and 45 dBA).

Impacts associated with other potential noise sources during operation are considered **less than significant**.

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.

4.8.4 CUMULATIVE SETTING, IMPACTS AND MITIGATION MEASURES

A. CUMULATIVE SETTING

The geographic extent of the cumulative setting for noise consists of the Project area and the surrounding areas within the County within approximately one mile of the Project.

B. CUMULATIVE IMPACTS AND MITIGATION MEASURES

Contribution to Cumulative Noise Levels

Impact 4.8.5 The proposed Project would not result in a substantial contribution to cumulative noise levels. Therefore, cumulative noise impacts would be considered **less than cumulatively considerable.**

Construction & Reclamation

Impacts associated with noise from on-site construction activities as well as construction vehicle traffic were considered less than significant. The Project area is rural with few sensitive receptors and construction noise would occur for a limited duration. No other cumulative projects are proposed to be constructed within one mile of the proposed Project. Therefore, the Project's contribution to cumulative noise levels is considered **less than cumulatively considerable** during construction.

Operation

Seville 4 Solar is not expected to have a regular on-site staff based at the Project site. According to Caltrans' *2015 Traffic Volumes* (Caltrans 2016), the segment of SR 78 north of the Project site accommodates an average of 780 vehicle trips daily. The Project's irregular daily trips would be nominal compared to the vehicle trips currently experienced on SR 78, and thus, would not result in a perceptible increase in traffic noise levels. There are no cumulative projects proposed to be constructed within one mile of the proposed Project to contribute to vehicle trips and noise along SR 78.

As stated, in addition to SR 78, the noise environment in the proposed Project area is characterized by existing solar energy generating facilities, including an existing substation, electrical transmissions lines, and power conversion station. However, individually the Project would result in noise levels below 30 dBA at the nearest sensitive receptor. 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 (FTA 2006). Assuming the existing solar generating components generate similar noise levels, there combined noise levels would still be well below the County's applicable daytime and nighttime noise standards (i.e., 50 and 45 dBA). The Project's contribution to cumulative noise levels is considered **less than cumulatively considerable** during operations.

Reclamation

Impacts associated with noise from on-site reclamation activities were considered less than significant. The Project area is rural with few sensitive receptors and construction noise would occur for a limited duration. No other cumulative projects are proposed to be constructed within one mile of the proposed Project. Therefore, the Project's contribution to cumulative noise levels is considered **less than cumulatively considerable** during reclamation.

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.