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SECTION ACRONYMS/ABBREVIATIONS

ACRONYM/ ABBREVIATION	DEFINITION
APN	Assessor's Parcel Number
Cal-OSHA	California Occupational Safety and Health Administration
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CTGs	Combustion Turbine Generators
CVC	California Vehicle Code
dB	Decibels
dBA	Decibel, A-weighted
DNL	Day-Night Noise Level (a.k.a. L_{dn})
DPLU	San Diego County Department of Planning and Land Use
EPA	United States Environmental Protection Agency
FPUD	Fallbrook Public Utility District
ft	Feet
GE	General Electric
Hz	Hertz
I	Interstate
kV	Kilovolt
kW	Kilowatt
L_{eq}	Equivalent Noise Level
L_{dn}	Day-Night Noise Level (a.k.a. DNL)
LORS	Laws, Ordinances, Regulations, and Standards
L_n	Percentile Noise Level or Statistical Sound Level
Lp	Sound Pressure Level (a.k.a SPL)
Lw	Sound Power Level (a.k.a. PWL)
OSHA	Occupational Safety and Health Administration
Project	Subject of this SPPE application, Orange Grove Project
Project Site	Approximately 8.5 acre parcel to be leased for the power plant Site (a.k.a. "Site")

ACRONYM/ ABBREVIATION	DEFINITION
Property	Approximately 202-acres owned by SDG&E that encompasses the approximately 8.5 acre Project Site and surrounding lands
PWL	Sound Power Level (a.k.a. Lw)
RD	Duplex Residential
RM	Multi-Family Residential
RMH	Mobile Home Residential
RR	Rural Residential
RRO	Recreation Oriented Residential
RS	Single Family Residential
SCR	Selective Catalytic Reduction
SDG&E	San Diego Gas & Electric Company
Site	Approximately 8.5 acre parcel to be leased for the power plant Site (a.k.a. "Site")
SPL	Sound Pressure Level (a.k.a. Lp)
SR	State Route
TWA	Time-Weighted Average
$TWA_{8\text{-}hr}$	Time-Weighted Average 8-Hour Work Shift
USFWS	United States Fish and Wildlife Service

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6.12 NOISE

6.12.1 Introduction and Project Overview

This section presents an evaluation of sound levels associated with the Project. The power plant Site is located in an unincorporated portion of north San Diego County, approximately 3.5 air miles northeast of Interstate (I) 15 on State Route (SR) 76, near the community of Pala (see Figures 2.2-1, 2.2-2, and 2.2-3). It is located approximately 0.15 mile north of the intersection of SR 76 and Pala del Norte Road. The area around and near the Site is rural with very few receptors of any kind in the area. As described in Section 6.9, Land Use, there are 8 residential structures within approximately 1.0 mile of the site and no other sensitive receptors nearby.

The plant design includes two General Electric (GE) LM6000 PC SPRINT combustion turbine generators (CTGs) with an air inlet chiller package, exhaust ducting, selective catalytic reduction (SCR) emission control systems, gas compressor equipment, black start generator, and water treatment/storage facilities. An onsite switchyard will be constructed near the south end of the Site.

Generally, the design basis for noise control is the most stringent noise level required by any of the applicable laws, ordinances, regulations, or standards (LORS). This design philosophy will ensure that the noise from this Project will comply with the County of San Diego Noise Regulations, as well as the California Energy Commission (CEC) guideline for the late-night noise increase increment.

These local requirements and CEC guidelines will be met with a combination of Project design features that optimize noise reduction and control from the expected major noise sources. These noise reduction features involve both architectural and equipment considerations. Architectural considerations involve the sound isolation performance of the architectural components, including the walls, roof, doors, windows, and louvers, of buildings housing equipment. Equipment considerations involve reduced noise emissions from the equipment sources themselves, as well as sound treatment systems including enclosures, silencers, and/or localized barriers. Each equipment component will be evaluated during the Project's detailed engineering phase to determine the noise control strategies necessary to support the overall Project acoustical design.

Section 6.12.2 presents the fundamentals of acoustics while a description of the LORS is presented in Section 6.12.3. The affected environment is described in Section 6.12.4 and the environmental consequences (i.e., the potential Project effects from both construction and operation) are analyzed in Section 6.12.5. While the Project design features and noise control strategies will yield noise impacts that are below the level of significance (per applicable standards and criteria), Section 6.12.6 presents mitigation measures aimed at (1) enabling feedback for community concerns regarding noise, (2) reducing noise during demolition and construction, and (3) establishing a mechanism for verifying compliance following commercial operation of the Project. The involved agencies and agency contacts are listed in Section 6.12.7.

The permits and permitting schedule are discussed in Section 6.12.8. Section 6.12.9 provides the references for this noise section.

6.12.2 Fundamentals of Acoustics

Acoustics is the study of sound, and noise is defined as unwanted sound. Airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave.

Acoustical terms used in this section are summarized in Table 6.12-1.

Table 6.12-1 - Definitions of Acoustical Terms

TERM	DEFINITION
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is often defined by the L_{eq} level (see below for more information on special noise metrics).
Background Noise Level	The underlying, ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background noise level. The background level is generally defined by the L_{90} percentile noise level.
Intrusive Noise	Noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal content, the prevailing ambient or background noise level, and the sensitivity of the receiver. The intrusive level is generally defined by the L_{10} percentile noise level.
Decibel (dB)	A decibel is a dimensionless unit of level which denotes the logarithmic (base 10) ratio between two quantities that are proportional to power; the denominator of this ratio is a reference standard which must be specified to give the decibel level any meaning. Decibels describe the loudness of sound and noise in terms of sound pressure levels and sound power levels.
Sound Pressure Level	The level, expressed in terms of decibels, that is 20 times the logarithm of the given sound pressure over the reference pressure of 20 micropascals = 2×10^{-5} Newtons/m^2 = 0.0002 μbar = 2×10^{-4} dynes/cm^2. Sound Pressure Level, abbreviated SPL or Lp, is dependent on the distance from the source to the receiver.
Sound Power Level	The level, also expressed in terms of decibels, which is 10 times the logarithm of the given sound power over the reference power of 1 picowatt. Sound Power Level, abbreviated PWL or Lw, is an inherent characteristic of the noise source and, therefore, is independent of distance from the source.
A-Weighted Sound Level (dBA)	The sound level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighted 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. Thus, A-weighted sound pressure levels are the most common noise metric used to describe community noise and all sound levels in this report are A-weighted.

TERM	DEFINITION
Frequency	The number of times in 1 second that a periodic phenomenon repeats itself. The units of frequency are the hertz (Hz) which corresponds to one cycle per second.
Band Pressure Level or Band Sound Level	The sound pressure level within a specified frequency band. The bandwidth is usually indicated by a descriptive modifier, such as octave band level or third-octave band level. As an example, the octave band level is the sound level within a frequency band corresponding to a specified octave. An octave is the frequency interval between two sounds whose basic frequency ratio is 2 (e.g. 500 Hz and 1,000 Hz are one octave apart). Note that octave band center frequencies and band limits are standardized by international agreement.
Equivalent Noise Level (L_{eq})	The energy-equivalent noise level over a specified period of time (e.g., 1 hour). It is an equivalent single value of sound that includes the same acoustic energy as the actual, varying sound levels in a given period of time.
Day-Night Noise Level (L_{dn} or DNL)	This metric was developed to account for an increased human sensitivity to nighttime noise levels and for the greater potential annoyance of noise during the nighttime hours. The actual nighttime noise levels are adjusted, based on the premise that both exterior and interior noise levels are generally lower than daytime levels and, therefore, nighttime noise can be more noticeable than daytime conditions at the same location. Also, since most people sleep at night, there is often an increased sensitivity to intrusive noises. The day-night noise level, abbreviated L_{dn}, is the energy-average A-weighted sound level over a 24-hour period with an added 10 dB adjustment (penalty) for sounds that occur between 10 p.m. and 7 a.m.
Community Noise Equivalent Level, CNEL	The CNEL was developed in California for evaluating noise levels in residential communities. The CNEL is similar to the L_{dn}, but differs in that a 5 dB evening penalty is also added to sounds that occur between 7 p.m. and 10 p.m. (as well as the L_{dn} penalty of +10 dB for nighttime sounds). In a large percentage of cases for general community noise, the L_{dn} and CNEL can be considered as equivalent.
Percentile Noise Level or Statistical Sound Level (L_n)	The noise level exceeded during *n* percent of the measurement period, where *n* is a number between 0 and 100. The most common statistical sound levels used in community noise analyses are the L_{90}, L_{50} and L_{10} levels. The L_{90} is the sound level exceeded 90 percent of the time and is often considered the effective background or residual noise level. The L_{50} is the sound level exceeded 50 percent of the time and is known as the median noise level. The L_{10} is the sound level exceeded 10 percent of the time, is a measurement of intrusive sounds, such as aircraft flying overhead, and is commonly known as the effective maximum or intrusive sound level.

Sources: Alliance Acoustical Consultants, Inc.

Loud noise can be annoying and can have negative health effects. The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, learning.
- Physiological effects such as startling and temporary and permanent hearing loss.

In most cases, environmental noise produces effects in the first two categories only. However, unprotected workers in some industrial work settings may experience noise effects in the last category. Sections 6.12.3.1 and 6.12.3.2 address how the Project will comply with pertinent

worker noise exposure protection regulations to safeguard against employee hearing loss. Given the wide variation in individual thresholds of annoyance, habituation to noise, and situational reactions to noisy environments, there is no common standard for assessing the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. Thus, an important way of determining a person's subjective reaction to a new noise is by comparing it to the existing or ambient environment which that person is familiar with. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by each exposed individual.

As a frame of reference for bridging objective sound levels to subjective impressions, Table 6.12-2 shows the A-weighted noise levels of sounds measured in common interior and exterior environments relative to their typical subjective impression.

Table 6.12-2 - Typical Sound Levels Measured in the Environment and Industry

EXAMPLE NOISE SOURCE OR EXAMPLE NOISE ENVIRONMENT	A-WEIGHTED SOUND LEVEL IN DECIBELS	SUBJECTIVE IMPRESSION
Shotgun (at shooter's ear) or on a carrier flight deck	140	Painfully loud
Civil defense siren (100 ft)	130	
Jet takeoff (200 ft)	120	Threshold of pain
Loud rock music	110	
Pile driver (50 ft)	100	Very loud
Ambulance siren (100 ft) or in a boiler room	90	
Pneumatic drill (50 ft) or inside a noisy restaurant	80	
Busy traffic; hair dryer	70	Moderately loud
Normal conversation (5 ft) or in a data processing center	60	
Light traffic (100 ft); rainfall or in a private business office	50	
Bird calls (distant) or inside an average living room or library	40	Quiet
Soft whisper (5 ft); rustling leaves of inside a quiet bedroom	30	
In a recording studio	20	
Normal breathing	10	Threshold of hearing

Source: Beranek, 1998.

6.12.3 Laws, Ordinances, Regulations, and Standards

This section presents and discusses the pertinent LORS that apply to noise generated by the Project, with regard to federal, state, and local agencies and jurisdictions. An overview of the

LORS is presented in Table 6.12-3 and the referenced sections provide further details and explanatory notes.

Table 6.12-3 - Applicable Laws, Ordinances, Regulations, and Standards

LORS	PURPOSE	AFC SECTIONS AND PAGES
Federal Offsite		
United State Environmental Protection Agency (EPA)	Guidelines for state and local governments.	6.12.3.1
United States Fish and Wildlife Service (USFWS)	Prevention of impacts to wildlife.	6.12.3.1
Federal Onsite		
Occupational Safety and Health Administration (OSHA)	Exposure of workers over 8-hour shift limited to 90 dBA.	6.12.3.1, 6.12.5.2 and 6.12.5.3. 6.17, Worker Safety
State Onsite		
California Occupational Safety and Health Administration (Cal/OSHA), 8 California Code of Regulations (CCR) Article 105 Sections 5095 et seq.	Exposure of workers over 8-hour shift limited to 90 dBA.	6.12.3.2, 6.12.5.2 and 6.12.5.3 6.17, Worker Safety
State Offsite		
California Vehicle Code Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.	6.12.3.2 Delivery trucks and other vehicles will meet Code requirements.
California Department of Fish and Game. (CDFG)	Prevention of impacts to wildlife.	6.12.3.2
CEC	Guidelines for power plant noise emissions into the community.	6.12.3.2
Local		
California Government Code Section 65302	Requires local government to prepare plans that contain noise provisions.	6.12.3
County of San Diego	See text.	6.12.3.3

Source: Alliance Acoustical Consultants, Inc.

6.12.3.1 Federal

EPA

Guidelines are available from the EPA (1974) to assist state and local government entities in development of state and local LORS for noise. Because there are local LORS that apply to this Project, these federal guidelines are not applicable.

OSHA

Onsite noise levels are regulated by the Occupational Safety and Health Act of 1970 (29 Code of Federal Regulations [CFR] 1910.95). The noise exposure level of workers is limited to 90 dBA, over a time-weighted average (TWA) 8-hour work shift ($TWA_{8\text{-}hr}$) to protect hearing. If there

are workers exposed to a $TWA_{8\text{-}hr}$ above 85 dBA (i.e. the OSHA Action Level), then the regulations call for a worker hearing protection program that includes baseline and periodic hearing testing, availability of hearing protection devices, and training in hearing damage prevention. Given previous experience at similar modern, simple cycle facilities, onsite noise levels during normal operations are expected to generally be in the range of 70 to 85 dBA. The relatively few areas that may be above 85 dBA will be posted as high noise level areas and hearing protection will be required therein. The power plant will implement a hearing conservation program for applicable employees and maintain $TWA_{8\text{-}hr}$ exposure levels below 90 dBA.

USFWS
Please see Section 6.6, Biological Resources, for a discussion of potential noise impacts to biological resources.

6.12.3.2 State of California

Cal-OSHA
The California Department of Industrial Relations, Division of Occupational Safety and Health enforces Cal-OSHA regulations (found in CCR Title 8, General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.). These California worker protection regulations are the same as the federal OSHA regulations described above.

California Vehicle Code (CVC)
Noise limits for highway vehicles are regulated under the CVC, Sections 23130 and 23130.5. The limits are enforceable on the highways by the California Highway Patrol and by the County Sheriff Department.

CDFG
Please see Section 6.6, Biological Resources, for a discussion of potential noise impacts to biological resources.

CEC
The CEC has determined that a significant noise impact may occur if noise from a new facility increases existing late-night L90 noise levels by 5 or more dB at nearby residential areas (Baker, 1999). An increase of 10 or more dB is a very significant impact, while the transition zone between +5 and +10 dB necessitates additional considerations (Baker, 2007).

6.12.3.3 Local

The California State Planning Law (California Government Code Section 65302) requires that all cities, counties, and entities (such as multi-city port authorities) prepare and adopt a General Plan to guide community change. The Project and its surroundings are located in the County of San Diego, which has noise abatement and control regulations, as discussed below. As this is in an unincorporated part of the County, there are no pertinent city standards.

County of San Diego

The County's noise regulations are found in the Code of Regulatory Ordinances, Title 3 Public Safety, Morals And Welfare; Division 6. Disorderly Conduct, Places And Publications; Chapter 4. Noise Abatement and Control, with the most relevant requirements in Section 36.404 (Sound Level Limits) and Section 36.410 (Construction Equipment). These requirements are summarized in the following table.

Table 6.12-4 - Noise Standards for the County of San Diego

NOISE SOURCE CONDITIONS	RECEIVING LAND USE	NOISE LEVEL LIMIT, A-WEIGHTED HOURLY L_{EQ},
Normal Operations (per Section 36.404)	Single family residential (RS)*, Duplex residential (RD), Rural residential (RR), Mobile home residential (RMH), Limited & General Agricultural (A70, A72), General Rural use (S92), and other uses with a density of less than 11 dwelling units/acre (RV & RU <11)	50 dBA daytime**, 45 dBA nighttime**
	Multi-family residential (RM), Recreation oriented residential (RRO), Office-Professional (C30), Parking (S86), and other uses with a density of 11 or more dwelling units/acre (RV & RU ≥11)	55 dBA daytime, 50 dBA nighttime
	Commercial and transportation/utility corridors (S94)	60 dBA daytime, 55 dBA nighttime
	Light Industrial (M50, M52, M54)	70 dBA anytime
	Heavy Industrial (M58)	75 dBA anytime
Construction/demolition activities (per Section 36.410)	All areas	Construction activities prohibited between 7 p.m. and 7 a.m. and limited to producing no more than 75 dBA average sound level at any property line with a legal dwelling unit.

Source: Alliance Acoustical Consultants, Inc., 2005

Notes:

* Land use designations from the County's General Plan, Part II Regional Land Use Element.

** Daytime and Nighttime defined as follows: daytime = 7 a.m. to 10 p.m.; nighttime = 10 p.m. to 7 a.m.;

For boundaries between different land use zones, the numerical average of the two zones' noise limits will apply.

6.12.4 Affected Environment

The Site is a former citrus grove. Existing uses adjacent to the Site include a San Diego Gas & Electric (SDG&E) substation, the private Pala del Norte Road, additional grove land, and open space. To the west, north and east of the Site, moderately steep slopes of open space rise up to two ridgelines, with three houses near the ridgeline northeast of the Site. Zalinda Farms Nursery and a few single family homes occur approximately 1.0 mile to the east and northeast of the Site, beyond the ridgeline. The Pala Casino and Spa Resort occurs approximately 1.5 miles to the east, but is separated from the Project site by a large hillside. On the south side of the Site, between the Site and SR 76, is an SDG&E storage yard. On the south side of SR 76 is a former aggregate mine and the mine pits have filled in with water; creating several large ponds. During

the original ambient noise survey, both the nursery and the SDG&E storage yard had on-property caretaker residences, but the SDG&E storage yard caretaker location will be vacated before Project construction begins.

Other than the caretakers at the nursery facility, the closest residential structures are along the ridgeline northeast of the Site (house numbers 10692 and 10960[1]). These houses are approximately 2,400 and 3,100 feet, respectively, from the Project site centroid. Farther to the north, approximately 3,900 feet, is a third residential use (accessed from Pala del Norte Road). There are also some scattered houses to the south of the Site, south of the mine's retention ponds (near the base of a large hill). There were no other residential, commercial, or sensitive receptors (schools, medical facilities, churches, etc.) noted in the vicinity of the Project Site. See also Figure 6.9-3 for additional land use and Project vicinity information.

6.12.4.1 Ambient Noise Survey Information

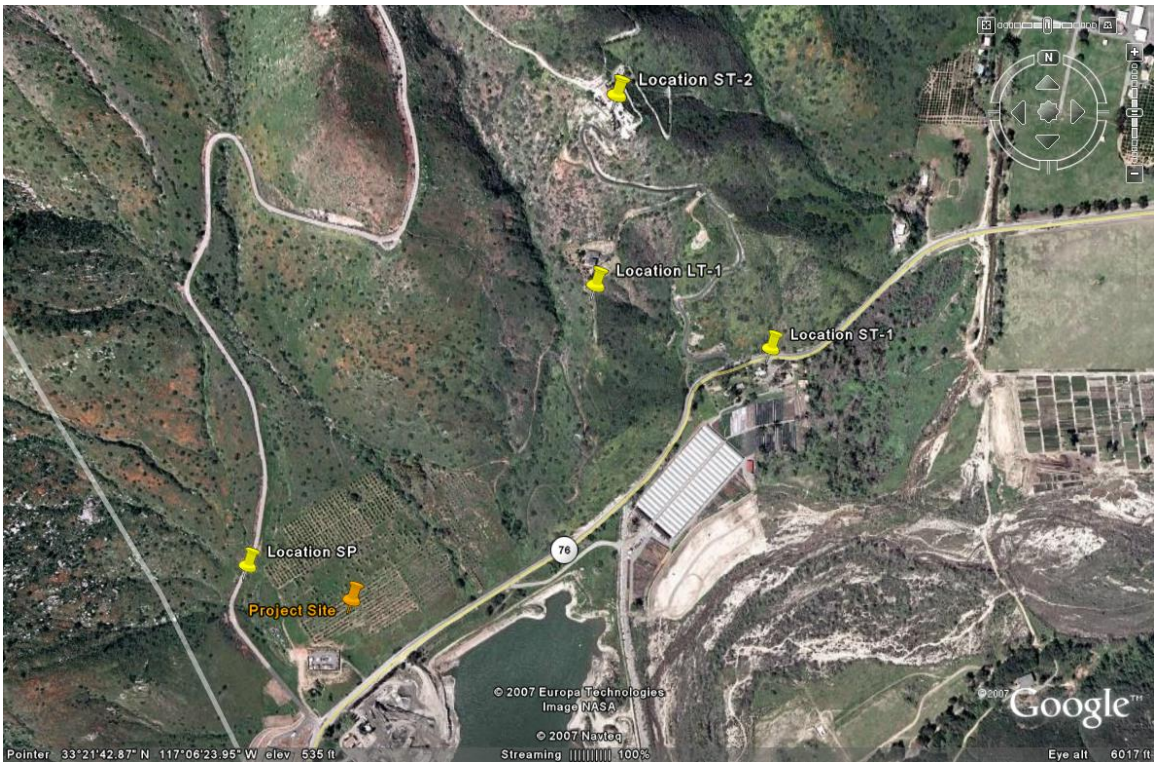
As part of the impact assessment analysis, baseline ambient noise level measurements were collected on April 18 and 19, 2007; focusing on the above actual receptor locations. Following discussions with San Diego County Department of Planning and Land Use (DPLU), additional ambient noise level measurements were collected on December, 12, 13, and 14, 2007; focusing on receptor locations along the SDG&E property line and on interior locations immediately around the Project site. The results of these two surveys will be discussed separately as follows.

<u>April 2007 Offsite Survey</u>
The measurement locations for this survey are depicted in Figure 6.12-1. Table 6.12-5 summarizes these April 2007 ambient survey locations and their individual importance regarding community noise assessment around potential power plants. One location was monitored over a 25-hour period (per CEC guidelines), two locations involved short-term A-weighted sound level data (typically 15-minute samples acquired during mid-day, evening, and late-night periods), and the fourth location was for documenting daytime and nighttime frequency band level data for a tonal baseline.

In general, environmental noise in the vicinity of the Project site is dominated by traffic flows on SR 76, during the daytime and even into the late-night hours. Other sources of noise are mechanical equipment in the vicinity as well as general operations of the Pala Casino and Spa Resort (located approximately 1.5 miles to the east of the Site). Occasional aircraft-related sources (i.e. airplane/helicopter fly-overs) were observed, but there were no train-related sources noted during the ambient survey. At night, during lulls in the SR 76 traffic, animals such as frogs, crickets, and barking dogs had some influence on the ambient conditions. In general, the noise environment around the Site was observed to be typical for a sparsely-populated rural setting that included a fairly heavily traveled roadway. Additional details on each measurement type and location are provided below.

[1] This house is under foreclosure and is currently vacant.

Figure 6.12-1 – Ambient Measurement Location Map (April 2007 Survey)



Source: Google Earth and Alliance Acoustical Consultants, Inc., 2007

Table 6.12-5 - Summary of April 2007 Ambient Measurement Locations and Relevance

Location	Full Description	Importance
LT-1	South side of closest house along ridgeline northeast of Project site. Approximately 2,400 feet from the center of the planned turbine installation. Coordinates are: N33° 21.787' by W117° 06.385'	Closest regular single family residential land use.
ST-1	At main entrance to Zalinda Farms Nursery at 10693 SR 76 (in small turn-out). This is near the caretaker residences to the nursery. Approximately 2,700 feet from the center of the planned turbine installation. Coordinates are: N33° 21.735 by W117° 06.191'	Nearby residential dwelling, although this is a special case as these are caretaker residences for the nursery.
ST-2	At edge of concrete driveway on the south of the second closest of three houses along the ridgeline to the northeast. Approximately 3,100 feet from the center of the planned turbine installation. Coordinates are: N33° 21.944' by W117° 06.371'	Second-closest regular single family residential land use.
SP (Spectral)	At edge of roadway along Pala del Norte Road near approximate location of future secondary entrance to Project site. Approximately 450 feet from the center of the planned turbine installation. Coordinates are: N33° 21.523' by W117° 06.774'	Typical and representative location for spectral environmental of Site and surrounding area.

Source: Alliance Acoustical Consultants, Inc., 2007
Note: Another long-term measurement location (LT-2) was established at the northeast corner of the fenced SDG&E storage yard; approximately 600 feet from the center of the planned turbine installation. Coordinates were: N33° 21.468' by W117° 06.665'. Sound level data was monitored here from 04/18/07 16:13 to 04/19/07 17:31. However, instrumentation failure yielded no useable noise data.

April 2007 Long-term, A-weighted Noise Levels

Measurement results for the 25-hour, long-term ambient sound level monitoring during the April 2007 survey are summarized in Table 6.12-6. This table provides measurement period at each location, as well as the key noise metrics in terms of the L_{90} (residual) sound level, the L_8 (intrusive) sound level[2], and the 1-hour L_{eq} (energy-equivalent) sound level. The latter metric is important since the County of San Diego Noise Ordinance is built around this averaged sound level type.

Table 6.12-6 - Summary of April 2007 Long-term Ambient Measurement Results

Location	Brief Description	Long-term Monitoring Period [date with hr:min]	Long-term Monitoring Data Ranges*		
			15-min. L_{90} (min, max times) [hr:min]	1-hour L_{eq} (min, max times) [hr:min]	15-min. $L_8 \approx L_{10}$ (min, max times) [hr:min]
LT-1	South side of closest house	04/18/07 15:35 to 04/19/07 17:04	26.8 – 40.3 dBA 03:30, 15:30	30.6 – 47.0 dBA 03:00+, 15:00+	31.5 – 51.1 dBA 03:30, 15:00

Source: Alliance Acoustical Consultants, Inc., 2007

* Data acquisition used 15-minute sampling periods which are reported for L_{90} and L_8 metrics, while the 15-minute L_{eq} data were post-processed to arrive at the reported 1-hour L_{eq} value (for use with respect to the County of San Diego Noise Ordinance).

The time-history record of sound levels over the 25-hour survey period for Location LT-1 is shown in Figure 6.12-2. This chart presents the pertinent sound levels over time at the nearest 'regular' residential land use.

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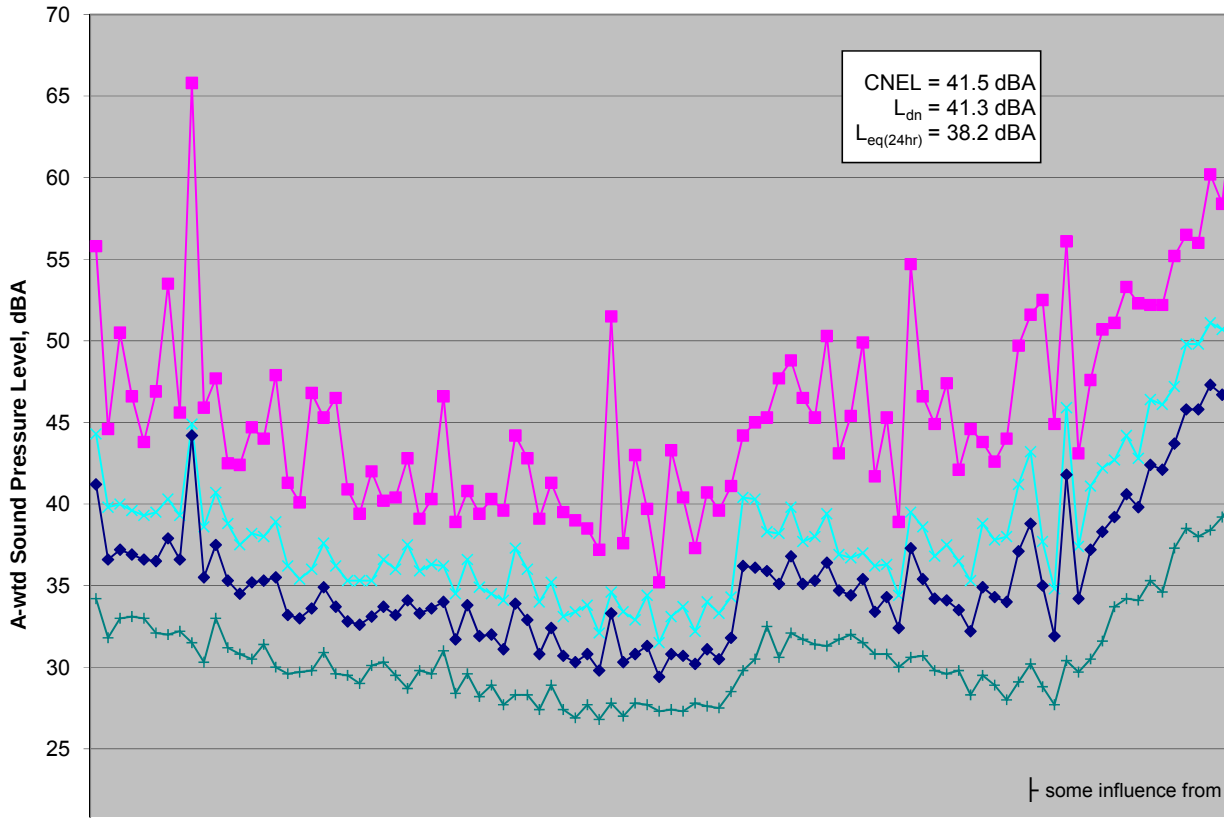
[2] Note that the L_8 was the actual noise metric sampled during the survey, but it is considered to be effectively equivalent to the L_{10} (intrusive) sound level for community noise assessments. These two metrics will, therefore, be used interchangeably in this document.

Figure 6.12-2 – Ambient Measurement Time History for Loc LT-1 (Apr 07, 2007)



The **Location LT-1** record indicates that the noise environment can be described as quiet most of the time. The noise levels are fairly stable throughout the day, and exhibit a slight, but steady decline into the evening and nighttime hours due to decreasing traffic flows on SR 76. The daytime levels were typically in the range of 34 to 38 dBA L_{eq} and 28 to 33 dBA L_{90}. The overnight noise levels 'bottomed-out' between approximately 2 a.m. and 5 a.m., after which there was a pronounced increase back up to the daytime levels (most probably due the new day's onset of daytime traffic flows). The overnight lows were 27 dBA for the L_{90} metric and 31 for the L_{eq} metric. Maximum noise levels, due to pass-bys of particularly noisy vehicles, could be in the mid-50's (or higher) during the daytime and in the mid-40's at night. There appear to be more maximum excursions in the morning rush hours, most likely related to traffic. During the second daytime period, some interference from winds (and rustling vegetation) was noted for Locations LT-1 and ST-2.

<u>April 2007 Short-term and Spectral Noise Levels</u>

In addition to the long-term, A-weighted monitoring efforts, additional locations were studied in terms of short-term (i.e. approximately 15 minute) A-weighted and spectral sampling to investigate the noise characteristics of other nearby receptors.

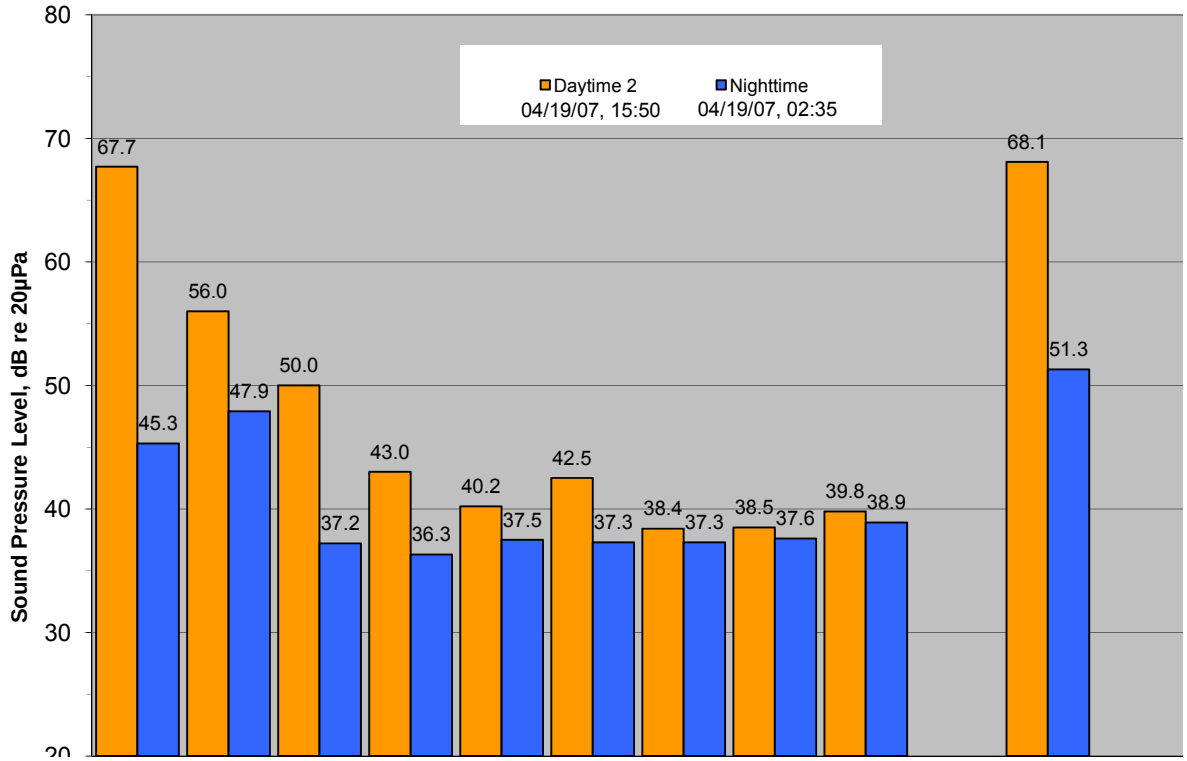
Table 6.12-7 - Summary of April 2007 Short-term Ambient Measurement Results

Location	Brief Description	Short-term Monitoring Periods [date with start time and duration in hr:min:second] and associated A-weighted L_{eq} Sound Levels		
		Mid-day	Evening	Nighttime
ST-1	At main entrance to Zalinda Farms Nursery (in turn-out).	4/19/07 (Thur) 15:14:47 0:16:14 53.6 dBA	4/18/07 (Wed) 20:32:45 0:12:14 63.6 dBA/	4/19/07 (Thur) 2:00:00 0:14:58 58.9 dBA
ST-2	At driveway of second closest house (currently vacant).	4/19/07 (Thur) 14:45:00 no data due to strong winds	4/18/07 (Wed) 21:15:00 0:15:00 45.6 dBA	4/19/07 (Thur) 1:29:00 no data due meter problem
SP	Pala del Norte Road, near future secondary entrance to Project Site.	4/19/07 (Thur) 15:48:22 0:11:26 47.4 dBA	no sample	4/19/07 (Thur) 2:33:41 0:10:17 44.7 dBA

Source: Alliance Acoustical Consultants, Inc., 2007

The frequency-band record of sound levels for different times of the day and night at the Project site is shown in Figure 6.12-3. This chart presents the pertinent sound levels in industry-standard octave bands at Location SP during the discrete sampling periods given above. These samples are representative of the Project site during the indicated time periods.

Figure 6.12-3 – Ambient Measurement Frequency-Band Record for Loc SP (Apr 07, 2007)



This Location SP spectral record is indicative of an environment that is primarily controlled by roadway noise sources. The daytime curve shape, in particular, is typical of traffic noise. Note how the A-weighted levels, separated by roughly 12 hours, are within 3 dB of each other. Given this result and the similar shapes of the curves in the bands that control the A-weighting function, the only significant parameter changing over the course of a typical 24-hour period is the number of vehicles traversing the adjacent roadway.

April 2007 24-hour Metrics

The 24-hour metrics, CNEL and L_{dn}, were calculated from the sampled energy-average, L_{eq}, values, starting at the sample period nearest the first whole hour. The results of these calculations are given below.

Table 6.12-8 - Summary of April 2007 24-hour Ambient Noise Level Metrics, A-Weighted Sound Pressure Level

LOCATION	BRIEF DESCRIPTION	24-HOUR L_{EQ}, DBA	L_{DN}, DBA	CNEL, DBA
LT-1	10692 Pala Road	38.2	41.3	41.5

Source: Alliance Acoustical Consultants, Inc., 2007

Generally speaking, these long-term noise metrics indicate a fairly quiet environment as would be expected for a sparsely populated, rural area with few significant noise sources. As previously mentioned, the major consistent noise source in the area is from traffic flows on SR 76. These flows were observed to be considerable during the daytime and evening hours. The flow of cars and trucks was reduced during the late-night hours, but was still noteworthy in terms of overall noise level contributions around the Project site and adjoining areas.

April 2007 Ambient Survey Summary

In summary, the general ambient noise environments around the Project site, as measured and observed in April of 2007, are condensed in Table 6.12-9. More details on the ambient survey methodologies are contained in Appendix 6.12-A.

Table 6.12-9 - Summary of April 2007 Ambient Noise Environments

LOCATION	BRIEF DESCRIPTION	GENERAL NOISE ENVIRONMENT
LT-1	South side of closest house.	Traffic noise on SR 76 is dominant during the daytime. In the evening, traffic noise is still significant, but not as pronounced as during the daytime. Frogs and crickets are secondary contributors during the evening hours. Late-night levels are very quiet with sporadic traffic in the distance and no frogs/crickets. As this location is on a ridgeline, winds can be of note by blowing through the trees and rustling the vegetation on the property.
ST-1	At main entrance to Zalinda Farms Nursery (in turn-out).	As this location is just off SR 76, traffic flow noise is the dominant noise source at all hours of the day and night. Only during lulls in traffic can other sources be heard (such as distant dogs barking, frogs, or crickets). Traffic flows were observed to be approximately 650 vehicles per hour during the daytime, 430 per hour during the evening, and 130 per hour late at night.

LOCATION	BRIEF DESCRIPTION	GENERAL NOISE ENVIRONMENT
ST-2	South side of second closest house (currently vacant)	This location was subject to noise from a nearby 20 kilowatt (kW) portable generator that appeared to be powering a temporary cellular antenna installation slightly down the hill from the house lot. Vehicles on the distant SR 76 were audible during most periods of the day and night, but did not dominate the noise environment. In the absence of the temporary generator, it is believed that this site would have noise levels that would be consistent with location LT-1. As this location is near the peak of a ridgeline, winds can be of note by blowing through the trees and rustling the vegetation on the property.
SP	Pala del Norte Road, near future secondary entrance to Project Site.	Traffic noise on SR 76 is dominant during the daytime and evening hours. Distant frogs, crickets, and dogs are secondary contributors during the evening hours. Reduced late-night levels are from the sporadic traffic with some contributions from frogs, crickets, and dogs.

Source: Alliance Acoustical Consultants, Inc., 2007

December 2007 Onsite) Survey

The measurement locations for this supplemental survey were chosen to gather ambient noise data at (a) positions along the SDG&E property line; (b) positions along the parcel boundary that the Project site is located within; and (c) positions at various distances away from SR 76 (from which roadway noise fall-off could be assessed). For the second assessment focus, the San Diego County parcel number is Assessor's Parcel Number (APN) 110-072-26, hereinafter referred to as 'APN-26'.

The measurement locations for the December 2007 survey are depicted in Figure 6.12-4. Table 6.12-10 summarizes these December 2007 ambient survey locations and their individual importance regarding the noise assessment around the proposed Project. All eight locations were monitored over at least 24 hours and two of these locations also involved documenting daytime and nighttime frequency band level data for additional tonal baseline data.

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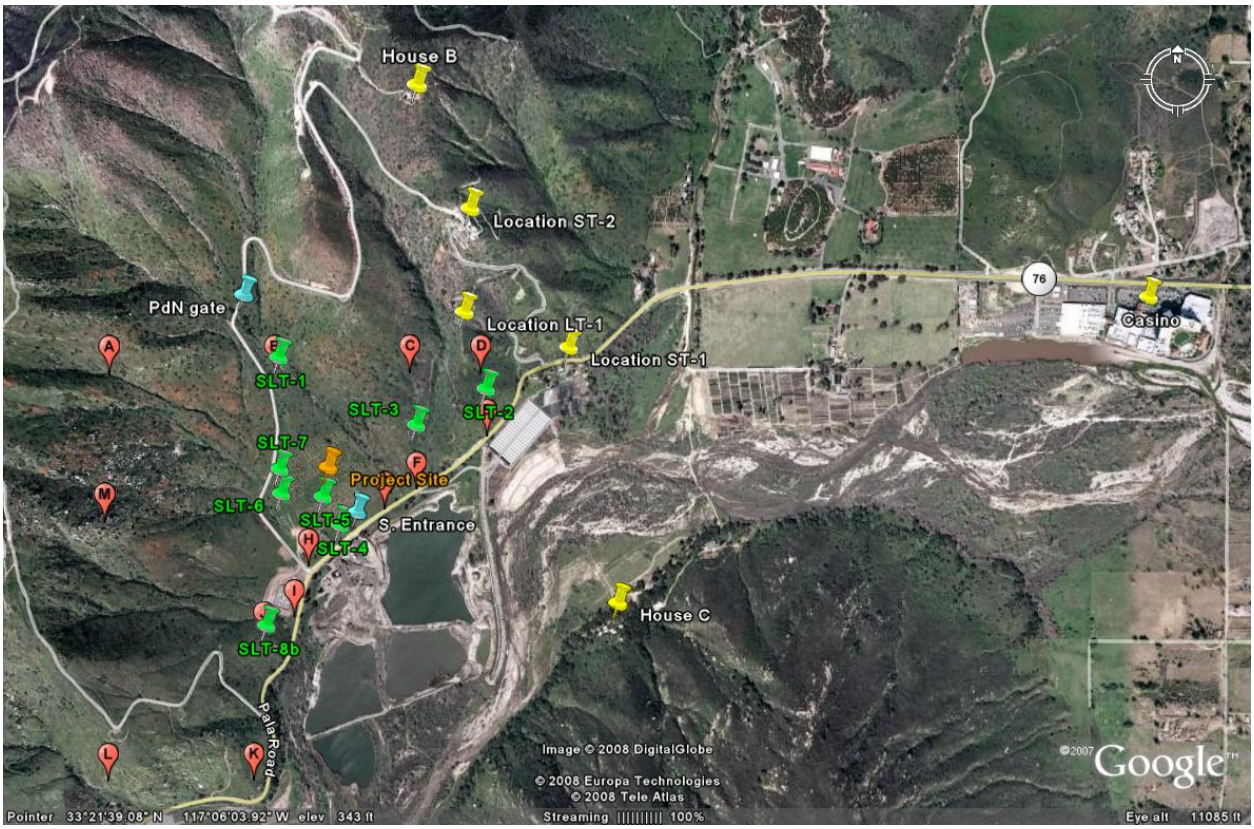
Figure 6.12-4 – Supplemental Ambient Measurement Location Map (Dec. 2007 Survey)



Source: Google Earth and Alliance Acoustical Consultants, Inc., 2007

The general environmental noise in the vicinity of the Project site was again observed to be dominated by traffic flows on SR 76, certainly during the daytime and even into the late-night hours. Other sources of noise are mechanical equipment in the vicinity as well as general operations of the Pala Casino and Spa Resort (located approximately 1.5 miles east of the Site). Occasional aircraft-related sources (i.e. airplane/helicopter fly-overs) were observed, but there were no train-related sources noted during the December ambient survey. At night, during lulls in the SR 76 traffic, animals, such as frogs, crickets, and barking dogs had some influence on the ambient conditions. However, there was a major nighttime noise source from the Zalinda Farms Nursery in the form of a motor-driven wind propeller that was probably being used for anti-freeze protection of nursery plants. Data indicates that this propeller system operated throughout nearly the entire nighttime periods (with some short off periods); from approximately 10:30 p.m. through until the following 8:30 a.m.[3]

In general, the noise environment around the Site was again observed to be typical for a sparsely-populated rural setting that included a fairly heavily traveled roadway. Additional details on each measurement type and location are provided below.

[3] The operations may have been automatically controlled by thermostat or some other environmental control.

Table 6.12-10 - Summary of December 2007 Ambient Measurement Locations and Relevance

LOCATION	FULL DESCRIPTION	IMPORTANCE
SLT-1 (25-hour and Spectral)	North edge of SDG&E property boundary; northwest corner of parcel boundary (Parcel APN 110-072-26, hereinafter 'APN-26'); near Pala del Norte Road. Approximately 1,150 feet from the center of the planned turbine installation. Coordinates are: N33° 21' 43.1" by W117° 06' 44.8" (at survey marker)	SDG&E property boundary location B. 1,700 feet from SR 76.
SLT-2 (25-hour)	East edge of SDG&E property boundary; on shielded side of ridgeline (away from plant site); overlooking nursery property; approximately 1,900 feet from the center of the planned turbine installation. Coordinates are: N33° 21' 40.0" by W117° 06' 20.9"	Between SDG&E property boundary locations D and E. 250 feet from SR 76.
SLT-3 (25-hour)	East edge of APN-26 parcel boundary; approximately 1,130 feet from the center of the planned turbine installation; interior to overall Site. Coordinates are: N33° 21' 36.5" by W117° 06' 29.2"	North of SDG&E property boundary location F. 440 feet from SR 76.
SLT-4 (25-hour and Spectral)	On southern (angled) edge of SDG&E property boundary; approximately 650 feet from the center of the planned turbine installation. Coordinates are: N33° 21' 26.7" by W117° 06' 38.2"	South SDG&E property boundary, between locations G and H. 60 feet from SR 76.
SLT-5 (25-hour)	On south edge of APN-26 parcel boundary; approximately 310 feet from the center of the planned turbine installation; interior to overall Site. Coordinates are: N33° 21' 29.5" by W117° 06' 40.1"	On APN-26 boundary, almost due south of plant centroid. 380 feet from SR 76.
SLT-6 (25-hour)	Southwest corner of APN-26 parcel boundary; approximately 465 feet from the center of the planned turbine installation; interior to overall Site. Coordinates are: N33° 21' 29.8" by W117° 06' 45.0"	On APN-26 boundary, southwest of plant centroid. 675 feet from SR 76.
SLT-7 (25-hour)	West edge of APN-26 parcel boundary; at approximate center of bridge on west entrance road to plant site; approximately 335 feet from the center of the planned turbine installation; interior to overall Site. Coordinates are: N33° 21' 32.2" by W117° 06' 45.1"	On APN-26 boundary, due west of plant centroid. 860 feet from SR 76.
SLT-8b (25-hour)	At southern end of angled side of SDG&E property boundary; approximately 1,690 feet from the center of the planned turbine installation. Coordinates are: N33° 21' 17.1" by W117° 06' 46.0" (at survey marker)	SDG&E property boundary location J. 330 feet from SR 76.

Source: Alliance Acoustical Consultants, Inc., 2008

Note: Potential west property boundary locations SLT-8a, -8c, and -8d were abandoned, upon field inspection, as being too difficult to access or of limited use for the noise study.

December 2007 Long-term, A-Weighted Noise Levels

Measurement results for the 25-hour, long-term ambient sound level monitoring during the December 2007 survey are summarized in Table 6.12-11. This table provides measurement period at each location, as well as the key noise metrics in terms of the L_{90} (residual) sound level,

the L_8 (intrusive) sound level[4], and the 1-hour L_{eq} (energy-equivalent) sound level. The latter metric is important since the County of San Diego Noise Ordinance is built around this averaged sound level type.

Table 6.12-11 - Summary of December 2007 Long-term Ambient Measurement Results

LOCATION	BRIEF DESCRIPTION	LONG-TERM MONITORING PERIOD [DATE WITH HR:MIN]	LONG-TERM MONITORING DATA RANGES*		
			15-MIN. L_{90} (MIN, MAX TIMES) [HR:MIN]	1-HOUR L_{EQ} (MIN, MAX TIMES) [HR:MIN]	15-MIN. $L_8 \approx L_{10}$ (MIN, MAX TIMES) [HR:MIN]
SLT-1	SDG&E Property boundary, N	12/12/07 14:45 to 12/13/07 14:45	27.6 – 43.3 dBA 01:30, 06:00	35.5 – 57.2 dBA 09:30, 06:00	35.6 – 50.3 dBA 09:00, 12:00
SLT-2	SDG&E Property boundary, E	12/12/07 13:45 to 12/13/07 14:00	42.6 – 62.5 dBA Noon, 06:00	51.2 – 65.3 dBA 19:00, 06:00	51.8 – 71.2 dBA 01:30, 06:00
SLT-3	APN-26 boundary, E	12/12/07 14:15 to 12/13/07 14:30	28.5 – 42.9 dBA 00:45, 14:30	41.0 – 52.3 dBA 03:00, 18:00	42.2 – 56.2 dBA 03:15, 18:15
SLT-4	SDG&E Property boundary, SE	12/12/07 17:20 to 12/13/07 23:20	36.0 – 51.5 dBA 01:35, 07:35	59.4 – 66.4 dBA 03:05, 07:05	60.0 – 71.5 dBA 03:20, 07:50
SLT-5	APN-26 boundary, S	12/12/07 16:45 to 12/13/07 23:15	30.0 – 49.0 dBA 01:34, 07:44	45.6 – 54.5 dBA 09:04, 04:04	47.5 – 60.5 dBA 09:34, 02:04
SLT-6	APN-26 boundary, SW	12/12/07 16:18 to 12/13/07 22:48	ND**	ND**	ND**
SLT-7	APN-26 boundary, WSW	12/12/07 19:00 to 12/14/07 00:00	29.6 – 45.2 dBA 01:30, 06:00	42.6 – 50.5 dBA 21:00, 15:00	41.5 – 56.5 dBA 01:30, 08:00
SLT-8b	SDG&E Property boundary, SSE	12/12/07 15:15 to 12/13/07 15:45	36.7 – 53.6 dBA 01:30, 23:30	51.7 – 56.9 dBA 11:00, 07:00	53.9 – 61.9 dBA 11:15, 06:00

Source: Alliance Acoustical Consultants, Inc., 2008

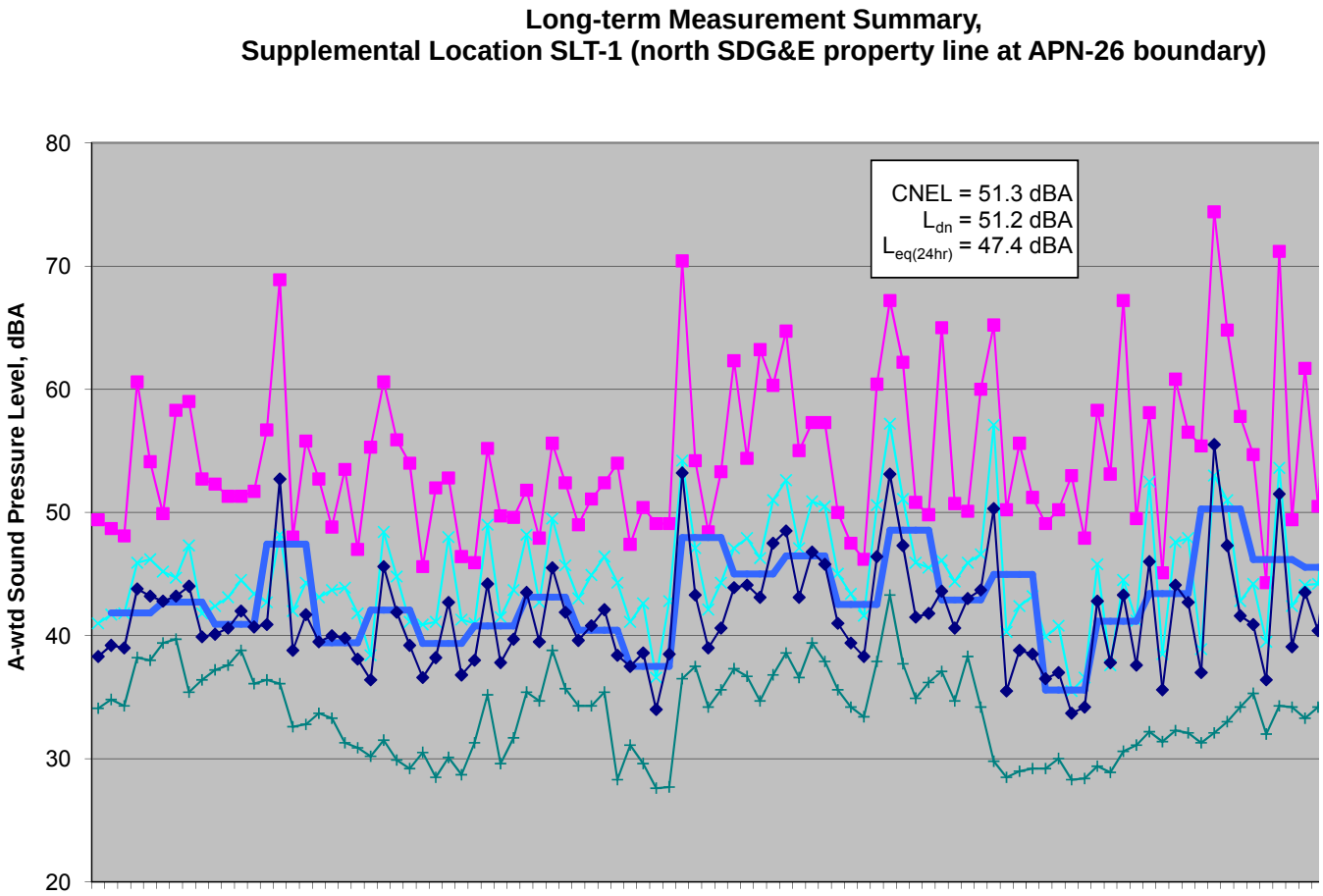
* Data acquisition used 15-minute sampling periods which are reported for L_{90} and L_8 metrics, while the 15-minute L_{eq} data were post-processed to arrive at the reported 1-hour L_{eq} value (for use with respect to the County of San Diego Noise Ordinance).

** Only 24-hour data were recorded at this location, but results indicate STL-6 is approximately 3 dB quieter than nearby SLT-5.

The time-history records of sound levels over the 24-hour+ survey period for Locations SLT-1 through SLT-8 are shown in Figures 6.12-5 through -12, respectively. These charts present the pertinent sound levels over time at the associated property boundary or parcel boundary. Following each chart is a brief discussion of the field observations to the associated with that location.

[4] Note that the L_8 was the actual noise metric sampled during the survey, but it is considered to be effectively equivalent to the L_{10} (intrusive) sound level for community noise assessments. These two metrics will, therefore, be used interchangeably in this document.

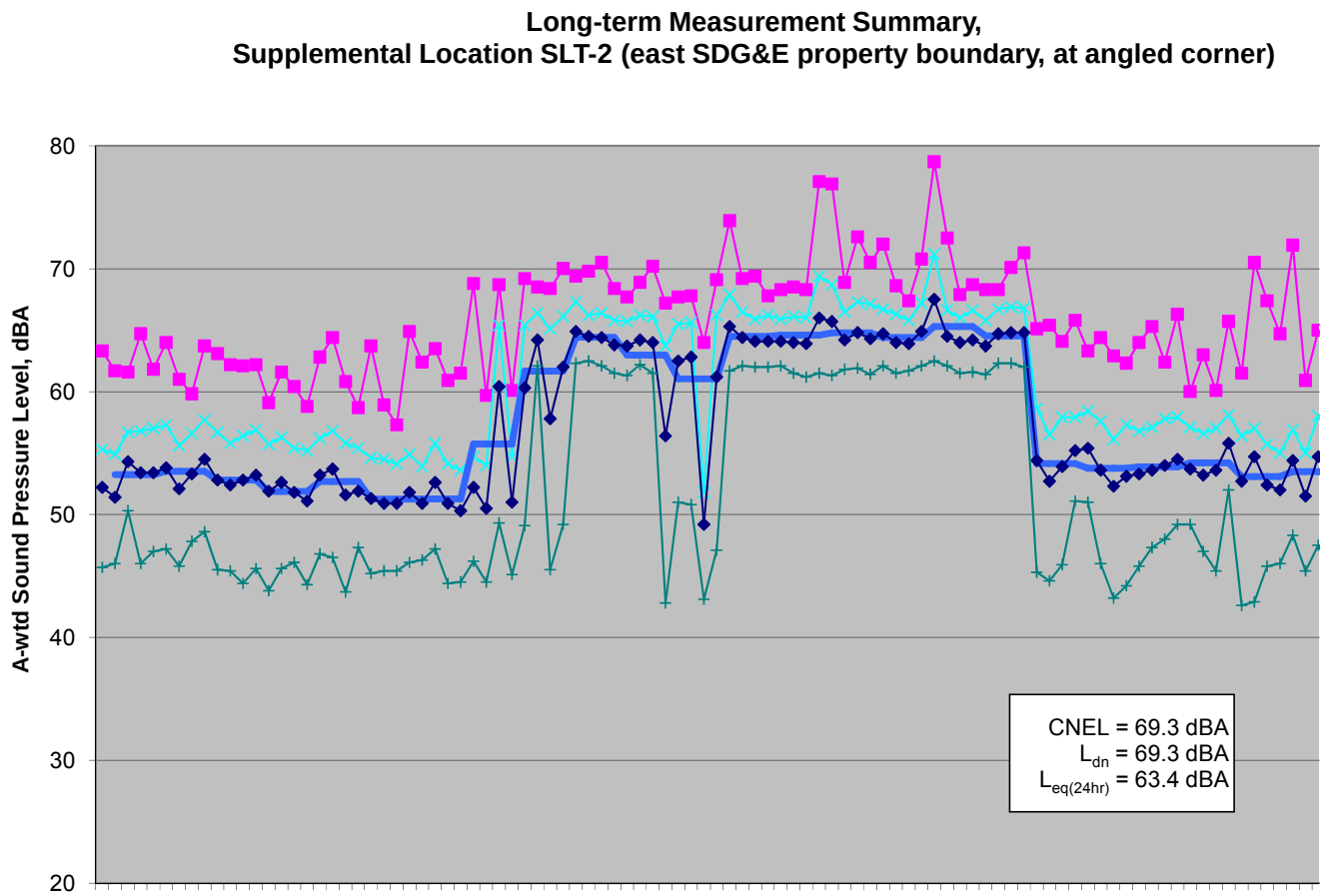
Figure 6.12-5 – Ambient Measurement Time History for Location SLT-1 (Dec 2007)



The **Location SLT-1** record indicates that the noise environment may be influenced by noise sources that are not typical for a sparsely-populated, rural/agricultural area. The hourly L_{eq} levels throughout the 24-hour period were typically between 40 and 50 dBA. During the daytime, the predominant noise source is traffic on SR 76 (even at approximately 0.3 mile away). Other daytime sources included occasional aircraft and helicopter fly-overs (in the distance), as well as birds and very sporadic traffic on Pala del Norte Road.

The nighttime levels were affected by machinery at the nursery, even though direct line-of-sight is precluded by the ridgeline between the nursery and this location. Note that most nighttime levels, in both the L_{eq} and L_{90} metrics, are typically noisier at night than during the daytime. Besides the nursery operations, other sources during the evening and nighttime hours included distant crickets and barking dogs.

Figure 6.12-6 – Ambient Measurement Time History for Location SLT-2 (Dec 2007)

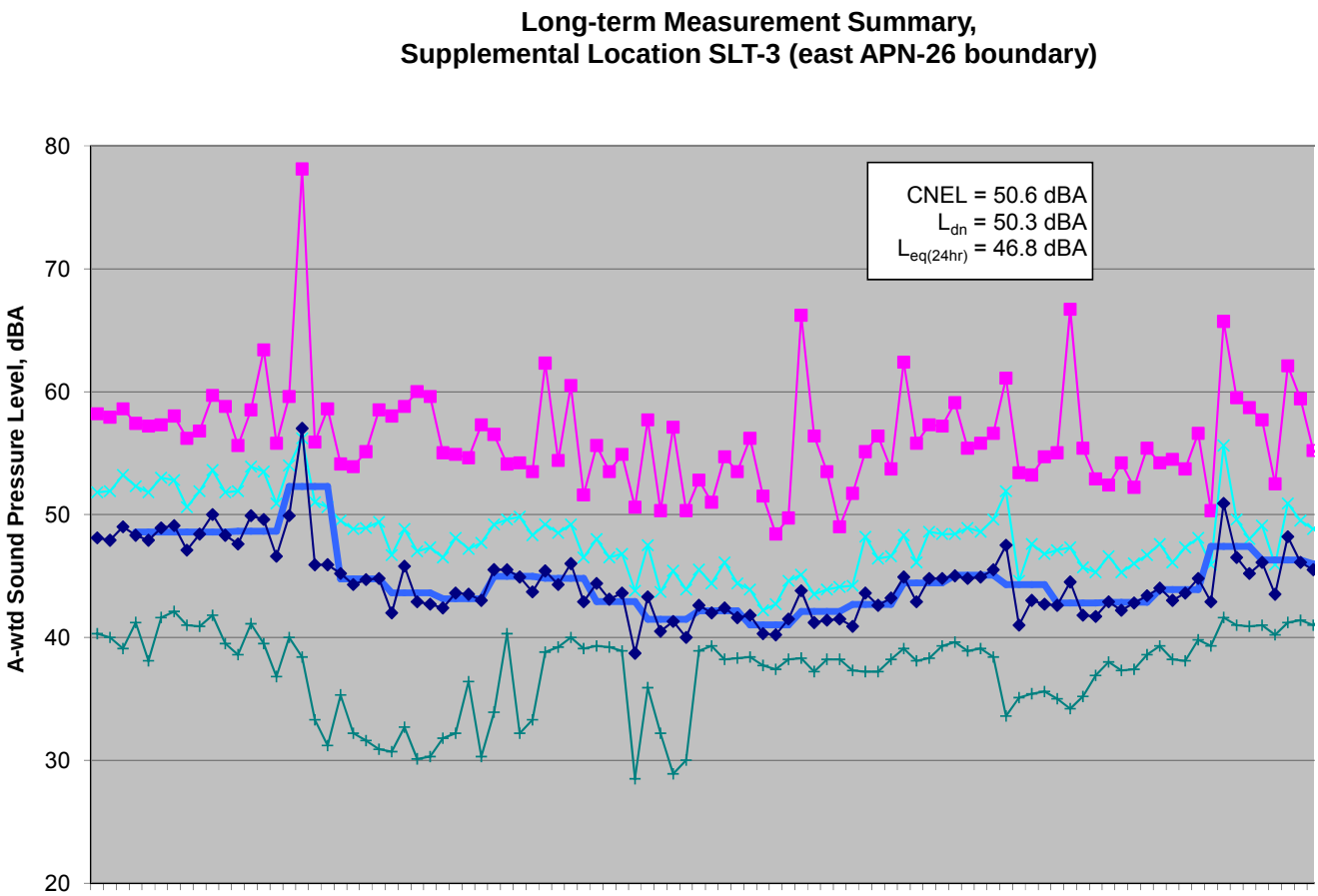


Location SLT-2 is on the hillside overlooking the nursery and SR 76 traffic. It is on the side of the hill away from the Project site, so this position would be very heavily shielded by the topography from Project-related noise sources. The SLT-2 record clearly shows the dominance of the anti-frost wind machine at the nursery during the nighttime hours. This wind machine made the nighttime noise environment louder than the daytime conditions by 10 to 12 dB. The nursery wind machine appears to have shut off for short periods around 22:30, 01:00, and 01:30 (possibly on an automatic thermostat control system).

The daytime hourly L_{eq} levels were typically in the mid-50's dBA, while the nighttime L_{eq} levels were between 61 and 64 dBA. Daytime noise sources included traffic on SR 76 and, to a secondary degree, vehicles and equipment at the nursery. As mentioned above, the nighttime environment was completely controlled by the nursery wind machine[5].

[5] It is unknown for what periods of the year this wind machine is running to, presumably, control frost on the nursery plants.

Figure 6.12-7 – Ambient Measurement Time History for Location SLT-3 (Dec 2007)



The **Location SLT-3** nighttime noise environment was also controlled by the nursery operations, even though direct line-of-sight at this location is broken by the hillside (to the east of the Project site). The nighttime L_{90} levels are in the upper-30's dBA when the nursery machinery was running and in the upper-20's and low-30's dBA for the few minutes that it was off. Hourly L_{eq} levels during these times were generally in the low- to mid-40's dBA.

Daytime noise levels were generally controlled by traffic flows on SR 76, but also included occasional aircraft fly-overs (in the distance), birds, and crickets. The daytime hourly L_{eq} levels were typically between 43 and 49 dBA.

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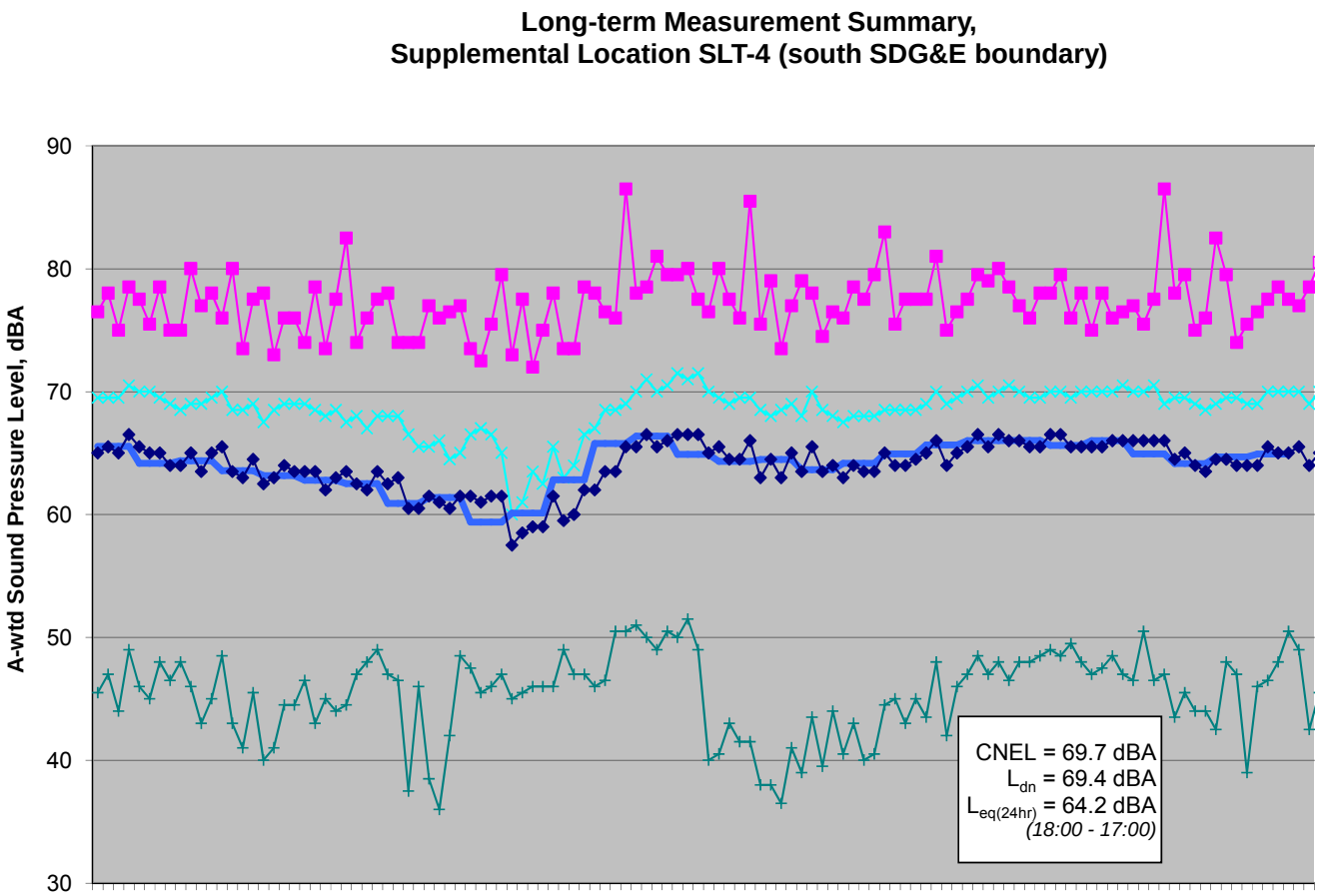
Figure 6.12-8 – Ambient Measurement Time History for Location SLT-4 (Dec 2007)



Location SLT-4 is just off SR 76 on the SDG&E property. As such, its noise levels were dominated by traffic flows on the highway going to and from Pala. During the daytime, ambient levels were generally in the low-40's dBA during lulls in SR 76 traffic and in the range of 65 to 70 dBA when vehicles were passing by. Maximum noise levels, regardless of time of day, were in the mid-70's to low-80's dBA, due to individual vehicles passing.

As with other locations toward the southern end of the overall property, nighttime noise levels were controlled by the nursery wind machine such that nighttime L_{90} levels were measured in the mid- to upper-40's dBA. The period between about 06:00 and 08:00 had the highest L_{90} levels for the 24-hour record; due to the wind machine operations. Other sources during the evening and nighttime hours included distant crickets and barking dogs.

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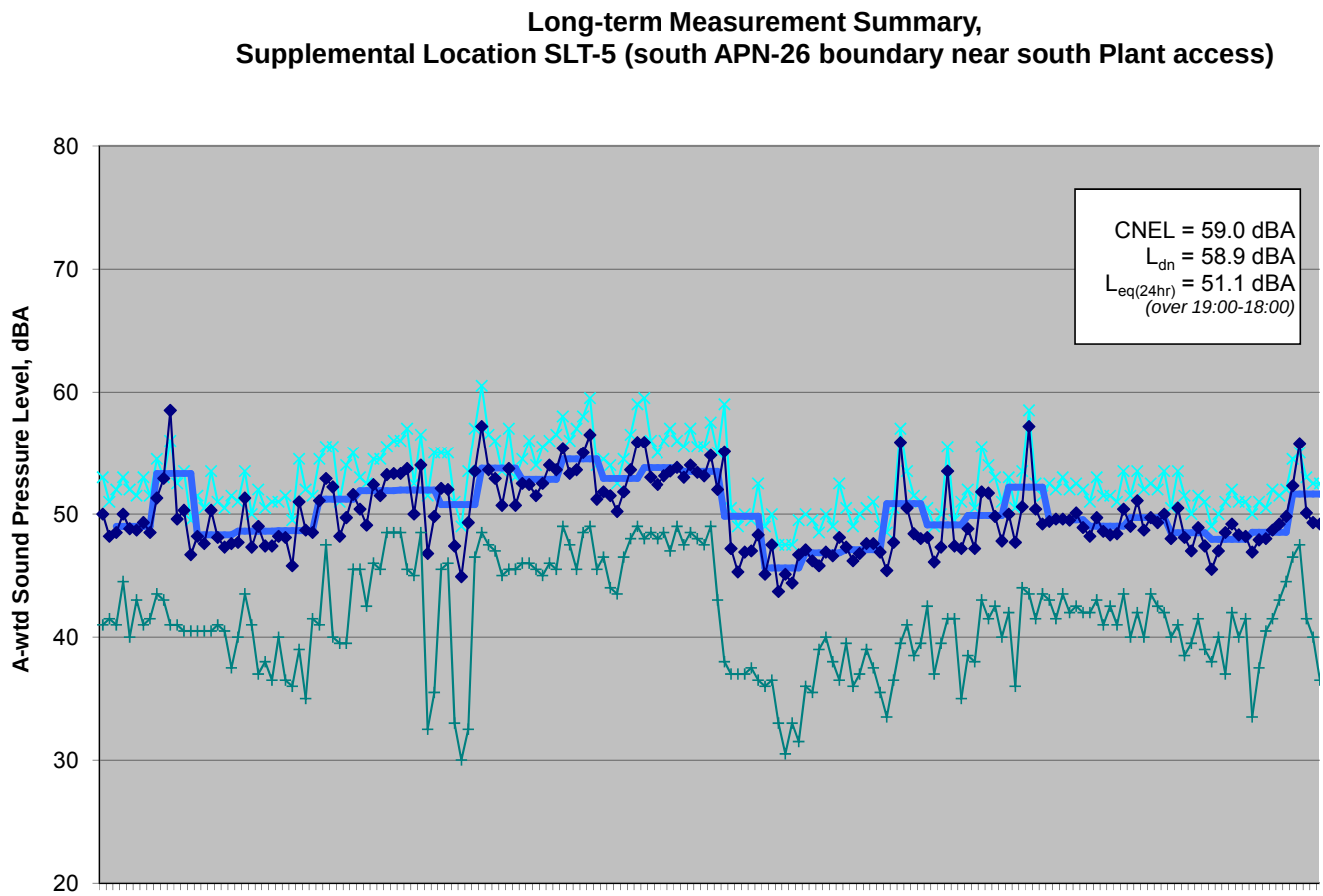
Figure 6.12-9 – Ambient Measurement Time History for Location SLT-5 (Dec 2007)



Location SLT-5 is on the southern edge of the APN-26 parcel and is directly south of the Project site. It is within 400 feet of SR 76, so traffic flow noise is the primary daytime noise source, along with birds and occasional aircraft fly-overs. Daytime L_{eq} levels were generally between 46 and 52 dBA.

Again, the nighttime levels were affected by the anti-frost wind machine at the nursery. The nighttime L_{eq} and L_{90} metrics were recorded as being typically noisier than during the daytime (due to the wind machine). Other sources during the evening and nighttime hours included sporadic traffic on SR 76, as well as distant crickets and barking dogs.

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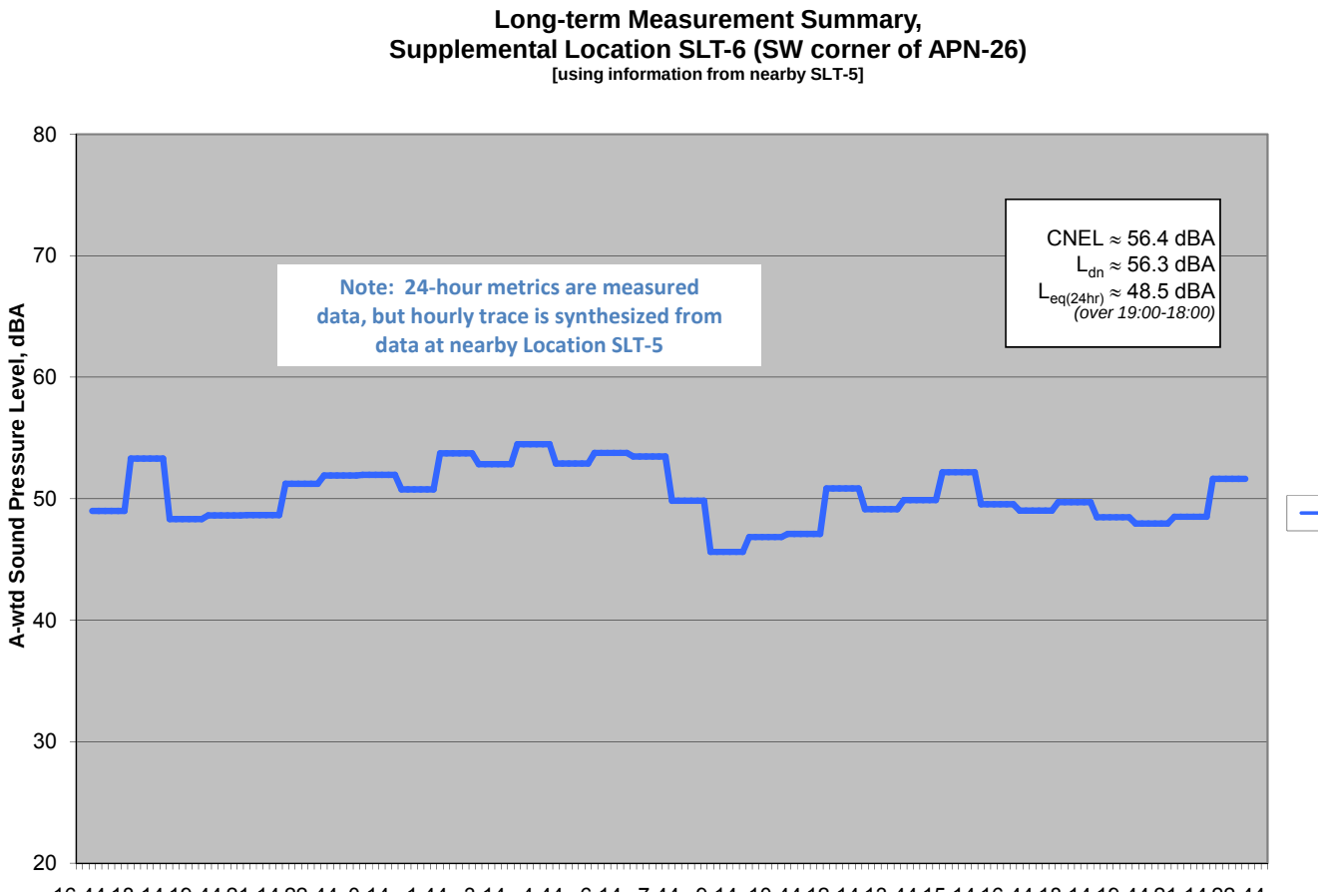
Figure 6.12-10 – Ambient Measurement Time History for Location SLT-6 (Dec 2007)



Location SLT-6 is at the southwest corner of the APN-26 parcel. This is near the southwest corner of the power plant site. It is approximately 675 feet from SR 76, so the traffic noise is diminished, as compared to closer locations (such as SLT-4 and SLT-5). The monitoring system was inadvertently set up to only log the overall session noise metrics (and not log the individual 10-minute time samples). These 32-hour monitoring metrics were compared to the same overall metrics for the next nearest location (SLT-5) and found to be approximately 3 dB lower (believed to be due to the increased distance from SR 76). As such, an hourly L_{eq} time history for SLT-6 (as shown above) was synthesized by applying this differential to the SLT-5 data. This approach was reinforced by the very similar field notes and observations for the two locations, regarding prominent noise sources. Thus, it is appropriate to conclude that the SLT-6 noise environment is very similar to the SLT-5 environment, only about 3 dB quieter than at SLT-5.

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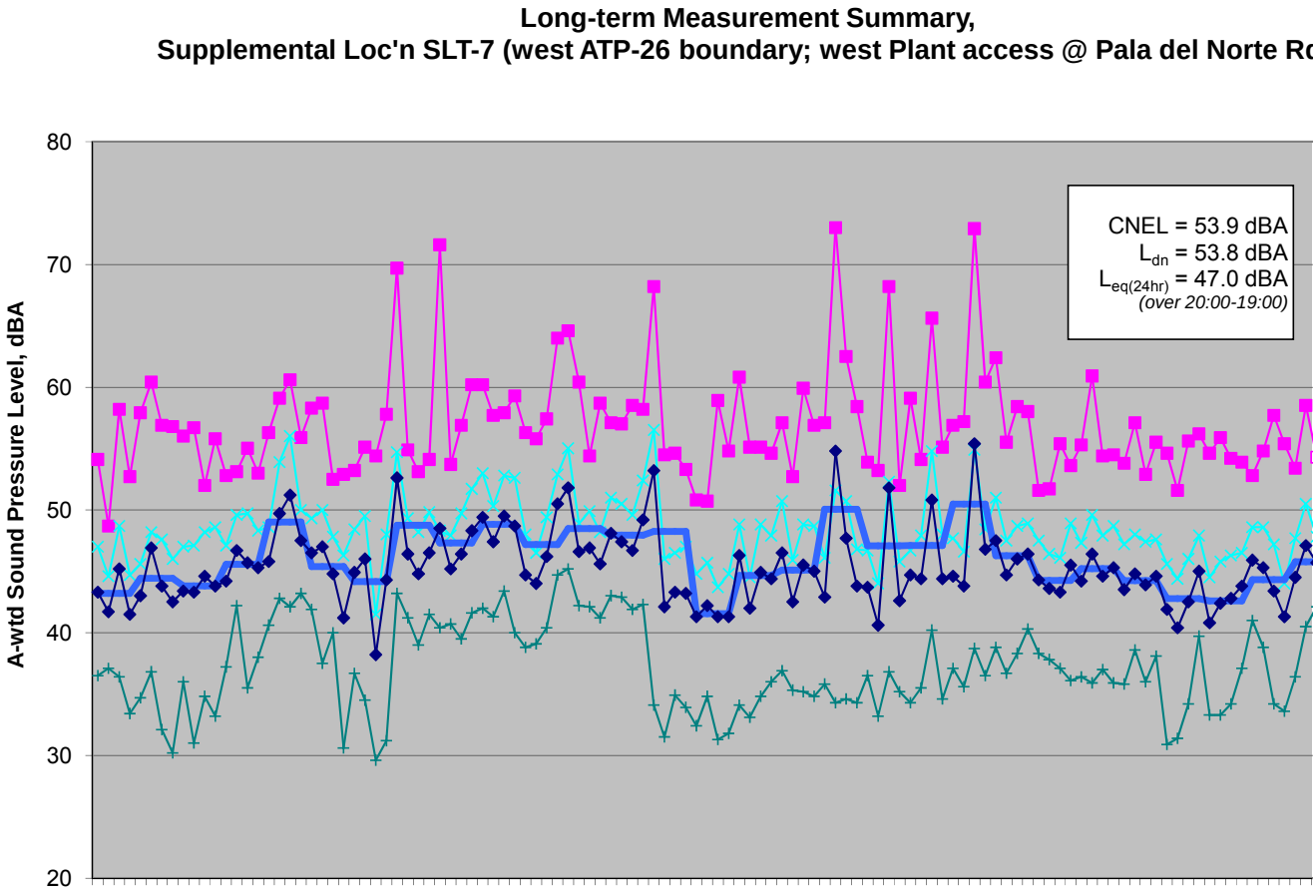
Figure 6.12-11 – Ambient Measurement Time History for Location SLT-7 (Dec 2007)



Like the other onsite measurements, the **Location SLT-7** record shows that the highest monitored L_{90} noise levels were during the nighttime period. This off-site noise sources at the nursery appear to have increased the nighttime residual levels by 12 to 15 dB. The hourly L_{eq} levels throughout the 24-hour period were between 41 and 50 dBA. The pronounced spikes in the maximum levels indicates the effects of individual noisy vehicles passing on SR 76 at all hours of the day and night.

During the daytime, the predominant noise source is traffic on SR 76 (approximately 860 feet away). Other daytime sources included occasional aircraft and helicopter fly-overs (in the distance), as well as birds and other wildlife.

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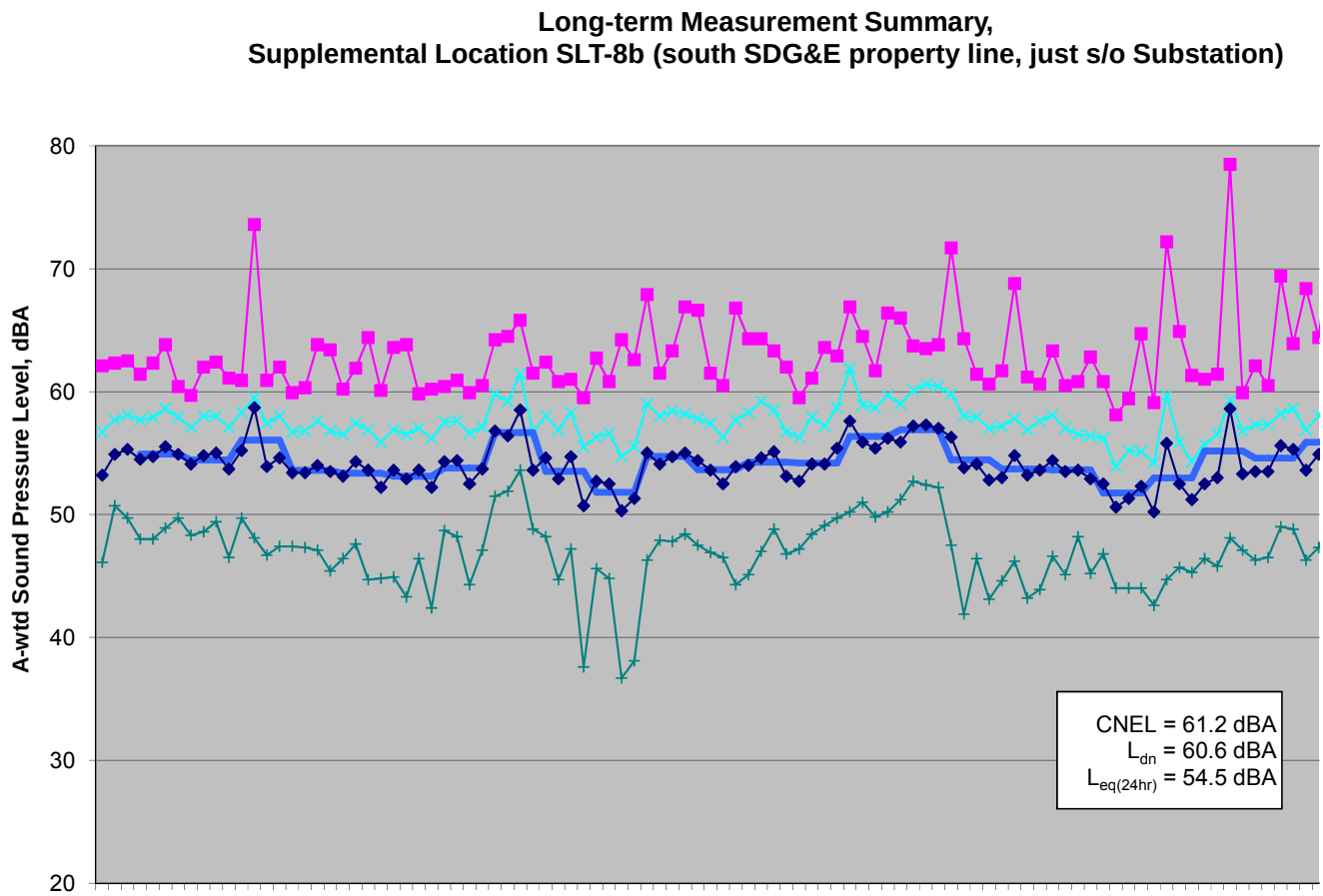
Figure 6.12-12 – Ambient Measurement Time History for Location SLT-8b (Dec 2007)



Location SLT-8b is on a ridgeline overlooking SR 76 (to the southwest and southeast), the existing substation, the mine ponds, and the Project site. This location is approximately 330 feet up the hillside from the closest part of SR 76 and is somewhat comparable to Locations SLT-2 (also up a hillside from SR 76) and SLT-5 in terms of the distance from the highway. This location is at a corner of the overall SDG&E property boundary (corresponding to boundary location 'J').

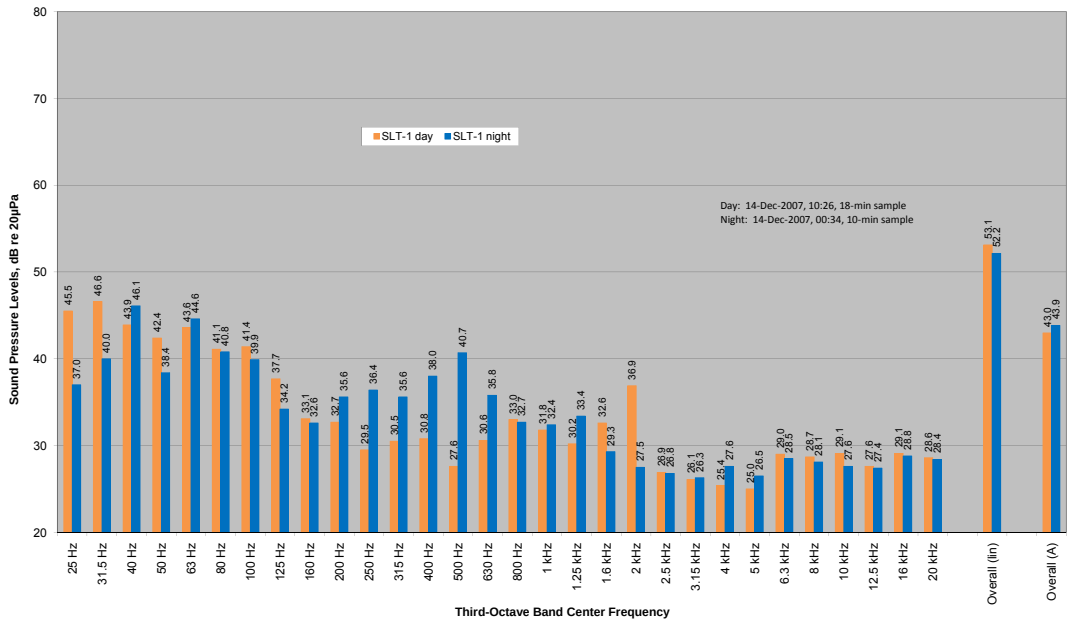
Although it is approximately 3,300 feet from the nursery wind machine, the nighttime L_{90} levels were strongly influenced by this noise source. Occasional vehicles passing on SR 76 also were noted as an important nighttime source. Nighttime L_{eq} levels were typically in the range of 54 to 57 dBA.

During the day, L_{eq} levels were typically in the range of 50 to 59 dBA; primarily due to traffic on SR 76, plus the occasional aircraft fly-over. Birds were also noted on the field record, but probably did not influence any metrics above the L_{90} levels.

December 2007 Spectral Noise Levels

In addition to the long-term, A-weighted monitoring efforts, two of the December locations were studied in terms of spectral sampling to investigate the frequency-band noise level characteristics of the general plant site during typical daytime and nighttime periods. The frequency-band record of sound levels for different times of the day and night at the Project site is shown in Figure 6.12-13 for Location SLT-1 and Figure 6.12-14 for Location SLT-4. These charts present the pertinent sound levels in industry-standard third-octave bands during the discrete sampling periods. These samples are deemed to be representative of the Project site during the indicated time periods.

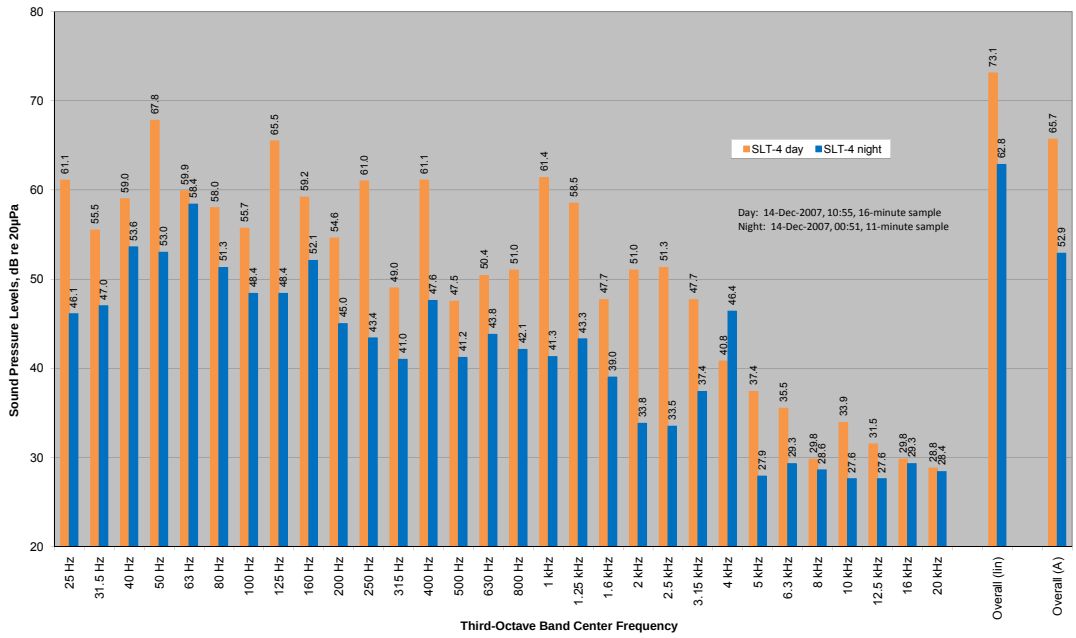
Figure 6.12-13 – Ambient Measurement Frequency-Band Record for Loc. SLT-1 (Dec 14, 2007)



The field notes for Location SLT-1 indicated that the primary noise source during the nighttime was the nursery wind machine (possibly shown in the bands between 200 and 800 Hz). For the daytime period, the environment was primarily controlled by roadway noise sources, with contributions from sporadic aircraft fly-overs in the distance, birds (2 kHz band?), and distant barking dogs.

For Location SLT-4 (nearest location to SR 76 and shown below), the daytime noise was dominated by cars, trucks, and motorcycles on SR 76. The occasional aircraft event in the distance also was noted, but did not appear to influence the spectral levels (over the nearby traffic flows). Nighttime levels were nearly all attributed to the nursery wind machine, with only some influence from sporadic car pass-bys on SR 76 (at around 1:00 a.m.).

Figure 6.12-14 – Ambient Measurement Frequency-Band Record for Loc. SLT-4 (Dec 14, 2007)



<u>December 2007 24-hour Metrics</u>

The 24-hour metrics, CNEL and L_{dn}, were calculated from the sampled energy-average, L_{eq}, values, starting at the sample period nearest the first whole hour. The results of these calculations are given below.

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Table 6.12-12 - Summary of April 2007 24-hour Ambient Noise Level Metrics, A-Weighted Sound Pressure Level

LOCATION	BRIEF DESCRIPTION	24-HOUR L_{EQ}, DBA	L_{DN}, DBA	CNEL, DBA
SLT-1	SDG&E Property boundary, N	47.4	51.2	51.3
SLT-2	SDG&E Property boundary, E	63.4	69.3	69.3
SLT-3	APN-26 boundary, E	46.8	50.3	50.6
SLT-4	SDG&E Property boundary, SE	64.2[a]	69.4	69.7
SLT-5	APN-26 boundary, S	51.1[b]	58.9	59.0
SLT-6	APN-26 boundary, SW	48.5[b]	56.3	56.4
SLT-7	APN-26 boundary, WSW	47.0[c]	53.8	53.9
SLT-8b	SDG&E Property boundary, SSE	54.5	60.6	61.2

Source: Alliance Acoustical Consultants, Inc., 2008

Notes:

a. for the period 18:00 to 17:00
b. for the period 19:00 to 18:00
c. for the period 20:00 to 19:00

Generally speaking, these long-term noise metrics indicate that there are one or more significant noise sources that are influencing such a sparsely populated, rural area. During the daytime hours, significant noise is generated by traffic flows on SR 76 and during the nighttime (at least during mid-December) considerable noise was coming from the anti-frost wind machine at the nursery. Even distant or topographically-shielded locations had noise levels that were controlled by the nighttime wind machine operations (when the flow of cars and trucks on SR 76 was reduced).

The proximity of the Project site to SR 76 and its associated traffic flows indicates that some portion of the overall Site may have existing noise levels that are above the County of San Diego nominal noise standards. Section 36.404 of the County Code provides for an adjustment to the sound level limits if the existing conditions are above said limits. Part of the December 2007 supplemental ambient survey was to assess where adjustments might come into play, given typical traffic flows on SR 76. The above monitoring data was analyzed with respect to distances from the centerline of SR 76. The analysis showed that sound level propagation during the daytime quite closely followed a drop-off rate of 4.5 dB per doubling of distance. This is not surprising in that such a distance propagation rate would be expected for a line source (like a major roadway) with sound traveling over soft soil or vegetated ground (as is the case at the Site). Analyses of nighttime data indicated a somewhat lower drop-off rate, but these results were undoubtedly influenced by the fact that nighttime noise was either a combination of SR 76 traffic flows (a line source) and the nursery wind machine (a fixed point source) or were dominated by the wind machine (which often included topographical aspects to complicate the propagation dynamics). For the more stable daytime noise environment, the noise emissions from usual SR 76 traffic, the 4.5 dB per doubling of distance drop-off rate, and the nominal limit of 50 dBA means that any typical receptor location within approximately 500 feet of the SR 76 centerline would be expected to have an upward adjustment to the County Code noise level limits.

December 2007 Ambient Survey Summary

In summary, the general ambient noise environments around the Project site, as measured and observed in December of 2007, are condensed in Table 6.12-13. More details on the ambient survey methodologies are contained in Appendix 6.12-A.

Table 6.12-13 - Summary of December 2007 Ambient Noise Environments

LOCATION	BRIEF DESCRIPTION	GENERAL NOISE ENVIRONMENT
SLT-1	SDG&E Property boundary, N	Traffic noise on SR 76 is predominant during the daytime, with secondary contributions from distant aircraft, birds, crickets, and dogs. In the evening, traffic noise is still significant, but not as pronounced as during the daytime. Late-night L_{90} and L_{eq} levels are generally higher than daytime values due to the operations of an anti-frost wind machine at the nursery across SR 76.
SLT-2	SDG&E Property boundary, E	Daytime noise is very consistent from the traffic flows on SR 76, which this location overlooks. The nursery wind machine directly across the highway totally dominated the nighttime noise environment, which was 10 to 15 dB louder at night.
SLT-3	APN-26 boundary, E	Daytime noise is controlled by SR 76 traffic flows with contributions from birds and aircraft events. Although shielded somewhat from the nursery by topography, this location's nighttime noise environment was still controlled by the nursery's wind machine operations.
SLT-4	SDG&E Property boundary, SE	Being just off SR 76 , highway traffic noise is steady and dominant during the daytime hours. Late-night L_{90} levels were from the nursery wind machine, but nighttime L_{eq} levels were due to both wind machine and traffic.
SLT-5	APN-26 boundary, S	Daytime noise levels, both L_{eq} and L_{90}, were controlled by SR 76 traffic flows. Nighttime L_{eq} and L_{90} levels were controlled by the nursery wind machine.
SLT-6	APN-26 boundary, SW	Same as directly above.
SLT-7	APN-26 boundary, WSW	Daytime noise is controlled by SR 76 traffic flows with contributions from birds and aircraft events. This location's nighttime noise environment, both L_{eq} and L_{90}, was controlled by the nursery's wind machine operations.
SLT-8b	SDG&E Property boundary, SSE	Since SLT-8 overlooks SR 76, traffic noise is steady and dominant during the daytime hours with only a few dB of variation in L_{eq} levels over the 24 hours. Late-night L_{90} and L_{eq} levels were influenced by both the nursery wind machine and traffic, with the latter becoming increasingly controlling after about 5 a.m.

Source: Alliance Acoustical Consultants, Inc., 2008

6.12.5 Environmental Consequences

Potential noise impacts from construction, start-up, and operation activities are assessed in this section.

6.12.5.1 Significance Criteria

The County has established quantitative standards for determining appropriate noise levels for various land use districts. Noise impacts may be considered significant if Project operational activities conflict with the Noise Level Limits by Land Use District summarized in Table 6.12-4.

In addition to the County criteria, the CEC has a criterion that a potential for a significant noise impact exists where the noise of a project during operations exceeds the background noise by 5 dB or more at residential receptors (CEC, 2002, 2007). It is important to note that the potential for an impact does not mean that there is an impact. Rather, it means that the project noise levels need further evaluation.

Also, the CEC maintains that construction noise is typically insignificant if (1) the construction activity is temporary, (2) use of heavy equipment and noisy activities is limited to daytime hours, and (3) all feasible noise abatement measures are implemented for noise-producing equipment (CEC, 2002).

6.12.5.2 Construction Impacts

Prior to commercial operations, noise will also be produced at the Site and in the area during the construction phase of the Project. This section addresses the various components of construction noise and vibration.

Worker Exposure to Noise

Worker exposure levels during construction phases of the Project will vary depending on the phase of the Project and the proximity of the workers to the noise-generating activities. Hearing protection will be available and its use will be enforced for workers and visitors, as needed, throughout the duration of the construction period. A Hearing Protection Plan, which complies with Cal-OSHA requirements, will be incorporated into the Health and Safety Plan.

General Construction Noise

Construction activities on the Site and for the transmission line and gas pipeline are expected to be typical of other small power plants in terms of schedule, equipment used, and other types of activities. The Project construction schedule is anticipated to be approximately 6 months in duration (see Section 2.0 for more details on the Site and linear facilities' construction phasing and timetables).

The construction process for the Orange Grove Project would be expected to generate noise during the following phases:

- Site Preparation
- Excavation
- Foundation Placement
- Plant and Building Construction
- Exterior Finish and Cleanup

Equipment utilized during the construction process would differ from phase to phase. In general, heavy equipment (bulldozers, dump trucks, and concrete mixers) will be used during the excavation and concrete pouring activities. Most other phases involve the delivery and erection of the building components.

The noise levels from construction activities will vary during the different activity periods, depending upon the activity location(s) and the number and types of equipment being used. Typical types of construction equipment are expected for this Project, including trucks, cranes, dozers, backhoes, and compressors. For representative groupings of these equipment types for each general construction phase, the Site-average sound levels are presented in Table 6.12-14.

Table 6.12-14 – Standard Construction Equipment Aggregate Noise Emissions Values

CONSTRUCTION PHASE	AGGREGATE EQUIPMENT NOISE LEVEL, SOUND PRESSURE LEVEL AT 50 FEET (DBA)
Site Clearing	84
Excavation	89
Foundations	77
Building Construction	84
Finishing	89

Source: USEPA (BBN), 1971

The highest site-average sound levels (89 dBA) are associated with the excavation and finish phases of construction. It is important to note, though, that not all the equipment included herein is used in every phase of construction. Further, the equipment used is not generally operated continuously, nor is it necessarily operated simultaneously.

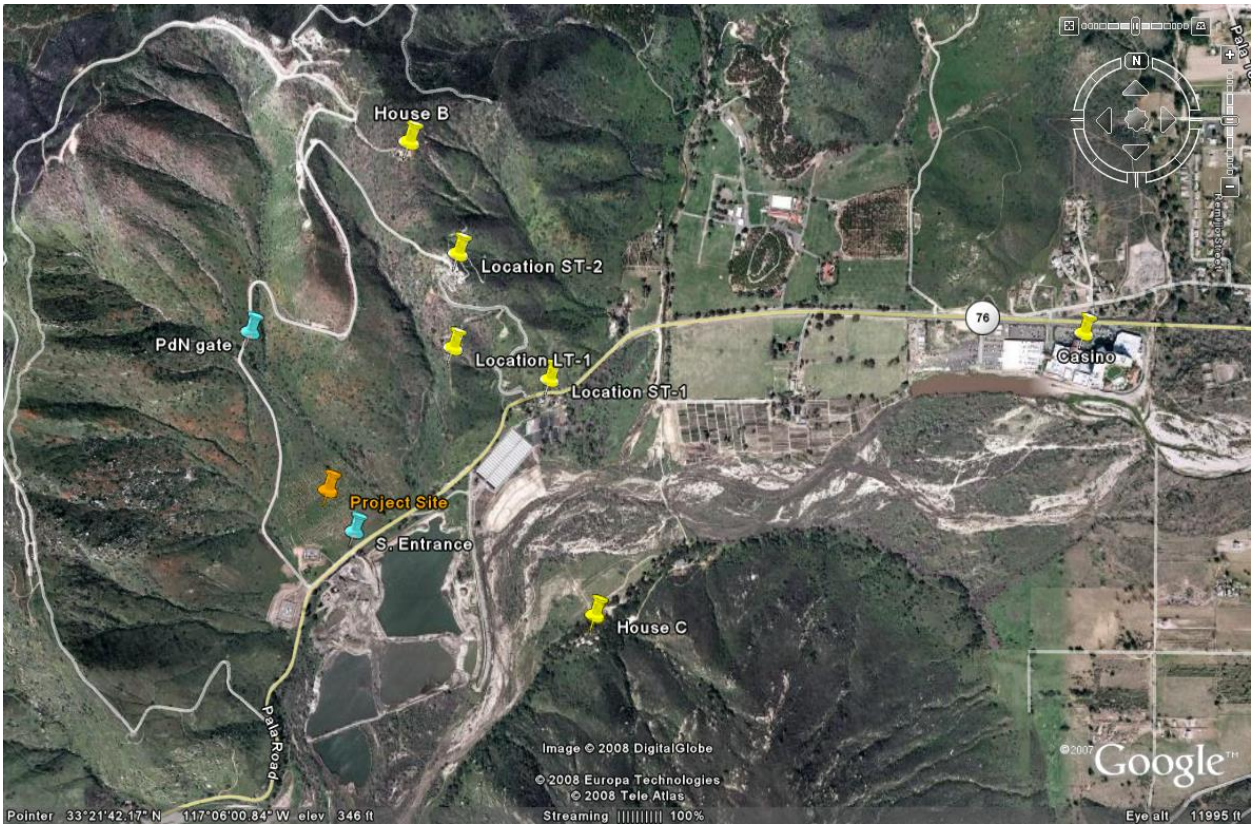
For the construction noise impact analyses, the worst-case periods of activity were investigated to calculate their respective noise emissions into the surrounding community.

Plant Construction Noise

The Project construction process will be centered around the power block of the new plant, a relatively small area. Since the construction zone is relatively small, a single centroid was used to define the aggregate equipment noise for the construction noise evaluations. The specific mix of equipment that is expected to be used during the construction program is discussed in Section 2.13. The construction activities were laid out in terms of expected construction equipment to be used at any given time during the month-to-month execution of the Project building program.

These monthly equipment sets were located at the centroid of the Project power block, their aggregate noise levels were calculated, and attenuation factors for spreading loss and for barrier effects were used to compute the expected, worst-case noise levels at each receptor location. The analyses used the same receptor locations as were used for the ambient survey, as well as additional locations, to evaluate potential impacts to nearby receptor locations. These receptor locations for the construction analysis are shown on Figure 6.12-15.

Figure 6.12-15 – Map of Construction Noise Analysis Locations



Source: Google Earth and Alliance Acoustical Consultants, Inc., 2007

The analyses indicated that the worst-case situation would occur in the first 2 months of construction. The results of this worst-case analysis are given in Table 6.12-15, which compares the predicted construction noise levels at each receptor location to the existing ambient noise environment. More details on the construction analysis methodologies and techniques are contained in Appendix 6.12-B.

Table 6.12-15 - Comparison of Predicted Noise Levels from Project Construction Activities to Existing Ambient Sound Levels

RECEPTOR LABEL	RECEPTOR DESCRIPTION[A]	HIGHEST PREDICTED CONSTRUCTION A-WTD SOUND LEVEL, DBA	MEASURED EXISTING AMBIENT DAYTIME LEQ NOISE LEVEL[A], DBA	DIFFERENCE BETWEEN CONSTRUCTION NOISE AND AMBIENT, DB
Community Receptor Locations (inhabited)				
LT-1	South side of closest house.	48	35	+13
ST-1	At main entrance to Zalinda Farms Nursery (in turn-out).	27	54	-27
ST-2	At driveway of second closest house (currently vacant).	44	~35[b]	+9
House B	Third house up ridgeline from LT-1 and ST-2 houses.	41	~35[b]	+6
House C	South of Project site near base of large hill.	28	~35[b]	+7
Casino	Pala Casino and Spa Resort.	<25	~45 (estimate)	-20

Source: Alliance Acoustical Consultants, Inc., 2007
Notes: [a]. nominal L_{eq} value across the daytime hours.
[b]. estimated value from similar locations and conditions.

As shown in this table, the majority of inhabited community receptor locations may be expected to have construction-related noise levels that would be from 6 to 13 dB above the general existing ambient level. For these locations, construction noise would be expected to be clearly audible during most of the daytime hours; depending on the actual, onsite construction activities, as well as the actual, moment-to-moment traffic conditions on SR 76. These periods of perceptibility are not considered significant, however, based on the temporary nature of the construction phases and the intermittent duration of the worst-case activities.

Other locations, that are behind hillsides (such as ST-1) or are large distances from the Project site (such as the Casino), would have construction-related noise levels well below current daytime ambient levels and onsite activities would be inaudible at these community locations.

In summary, the worst-case construction noise levels are expected to be clearly audible at the closest receptors, as compared to the current ambient conditions. However, due to the small number of inhabitants, the short-term nature of these activities, and their limitation to daytime hours (per County Code), these construction noise levels would not be considered significant.

Linear Facilities Construction Noise

In addition to the plant site construction, the Project will require the construction of linear facilities. That is, a pipeline will need to be laid generally paralleling SR 76 from the Site to approximately Rice Canyon Road to tie into an existing natural gas transmission line. As plant process water will be trucked in, no water pipeline will be needed. This construction of a gas pipeline will involve the short-term digging of trenches for new supply lines to service the

Project. Noise emissions from these trenching operations will be localized in the vicinity of the activities on any given day. Furthermore, as the trenching progresses along the pipeline pathway, the localized area with construction noise levels will move from week to week. Given the very sparse number of receptors along the pathway, these localized and temporary noise emissions will not be significant.

Water Pickup Facilities Construction Noise

Fresh water and reclaimed water will be trucked to the Site and used in various process systems. There are two separate offsite pickup locations for truck loading. Sensitive receptors are several hundred feet away from both of these water supply pickup facilities. Both of these water loading facilities will be constructed, owned, and operated by the Fallbrook Public Utility District (FPUD). Construction will involve a small amount of grading and excavation work, the installation of piping 'Ts' and associated valving, and earthwork finishing. The actual construction work at the two sites is expected to only last a few days.

Given the small number of inhabitants in the immediate areas, the short-term nature of these activities, and their limitation to daytime hours (per County Code), these water pickup facility construction noise levels would not be considered significant.

Plant Start-up and Commissioning Noise

Once the plant construction is completed, the Project will move into the start-up and commissioning phase in preparation of licensed operations. Other than the operations of some or all of the plant equipment, working up to a normal, full-load configuration, the major noise sources during start-up and commissioning involve air purging and rotating equipment run-ups. The vast majority of the air purging are related to line cleaning of the process piping to remove foreign objects, welding slag, dirt, and other debris that may have found its way into the piping during plant construction. Although commissioning and initial start-up only lasts a few weeks between the end of construction and the beginning of long-term, normal operations, and although line-cleaning only occurs during this relatively short-lived phase of a plant's life cycle, the frequency, length, and noise intensity of air purging can be significant. Therefore, temporary vent silencers are often used during this period to reduce the discharge noise levels.

To summarize, typical commissioning and initial start-up activities will generate considerable, but intermittent, noise levels. Some of these discharges (line cleaning), given their continuous or near-continuous duration, are typically silenced to reduce the noise in the community to insignificant levels. However, start-up activities may be quite discernible and could be a potential source of annoyance. These potential annoyances would be short-term and would be experienced intermittently only during commissioning and initial start-up and are not, therefore, expected to result in significant impacts, based on the criteria thresholds.

Plant Emergency Situation Noise

Following start-up and commissioning, a specialized situation is if an emergency shut-down is needed (during an abnormal event or equipment malfunction). These rare, emergency-related events are not expected to produce significant noise levels on the Project site or at nearby receptor locations. Thus, less than significant impacts are expected for these plant emergency situations.

Construction Vibration

The main source of vibration during typical heavy industrial construction is normally taken to be from pile driving activities. Standard pile installation involves impacting each pile with a large weight or hydraulic ram; much like using a hammer to pound a nail into wood. This technique can generate significant ground-borne vibration levels, depending on the soil characteristics and proximity of vibration-sensitive receptors. However, it is not anticipated that pile driving will be needed due to the relatively small equipment and buildings being planned (as compared to a full-size power generation facility). If piles are needed for foundations, it is assumed that they will not be installed using the classic pile-driving techniques, but, rather, with quieter and less vibration-producing auguring installation techniques.[6]

Other than potential auger piling, other vibration sources could entail the movements of concrete mixer trucks and heavy-haul equipment delivery trucks over roadway discontinuities. However, these Project-related truck movements are not expected to be any different than the current heavy truck movements on the adjacent SR 76.

As such, and given the relatively long distances for ground-borne vibration to propagate to the nearest receptor installation, no measurable vibration levels at any offsite receptor are expected. Thus, potential construction vibration impacts are considered to be less than significant and no additional mitigation is required.

Water Supply

Two water pickup stations will be constructed owned and operated by the FPUD and will be used to load water trucks to haul water to the Site as described in Section 2.6. These water pickup stations will require only minimal construction, with less than 500 cubic yards of soil to be graded at each of the two water pickup stations. Construction activities to occur at the reclaim water pickup station are described in Section 2.6.2.1. Construction activities to occur at the fresh water pickup station are described in Section 2.6.2.2. With the minor nature of these construction jobs, noise from construction will be short term, expected to be about 5-10 days of construction activity at each site. Section 6.9, Land Use, describes land uses near the water pickup stations, which are located approximately 400 feet or more from the nearest receptors. Construction will occur during daylight hours. Considering the minor nature of construction at these locations, the short duration of construction work, the distance to nearest receptors, and the daytime nature of this work, the noise impact will be less than significant.

[6] Standard pile installation involves impacting each pile with a heavy weight or hydraulic ram, much like pounding a nail into wood. Besides the high noise levels (typically ranging from 101 to 106 dBA at 50 feet, CERL, 1978), standard pile driving can be very annoying due to the repeated, pounding nature of the operation. Significant ground vibrations can also result from the heavy impact forces being generated. Auger cast piles, in contrast, are more analogous to drilling a hole into a piece of wood and filling it with putty. Noise levels from augered pile installation are from 5 to 15 dB quieter than for standard driving techniques and do not include the annoying pounding, impact sounds. Rather, noise levels from auger piling are dominated by diesel engine noise, much akin to noise from cement trucks or trenching machines. Likewise, augered piles generate substantially less ground-borne vibration levels than driven pile processes.

6.12.5.3 Operational Impacts

This section describes the expected noise impacts from operation of the plant.

Worker Exposure to Operational Noise

Nearly all components of the Project will be specified not to exceed near-field maximum noise levels of 90 dBA at 3 feet (or 85 dBA at 3 feet where available as a vendor-standard). Since there are no permanent or semi-permanent workstations located near any piece of noisy plant equipment, no worker's time-weighted average exposure to noise should approach the level allowable under OSHA guidelines. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA. Outdoor levels throughout the plant will typically range from 90 dBA near certain equipment to roughly 65 dBA in areas more distant from any major noise source.

Transmission Line and Substation Noise Levels

Noise from energized transmission lines is exhibited via a humming noise caused by the corona effect, which is a localized ionization of air around the transmission line. Corona noise is generally a principle concern with transmission lines of 345 kilovolt (kV) and higher. The Project's main voltages of 69 kV will thus preclude many corona effects. Also, the Project's underground cabling from the Site switchyard to the existing SDG&E substation is not expected to contribute significantly to the existing corona effects. Further, no additional corona noise, due to the Project, is expected from the high-voltage transmission lines that are near the Project site (to the east and near location ST-2). Consequently, no noise impact is expected from the operation of the Project electrical transmission lines.

Natural Gas Supply Pipeline and Fuel Gas Compressor Station Noise Levels

Operational noise from the buried fuel gas supply pipeline is not anticipated to generate any audible sound levels. The fuel gas compressor station is planned to be inside of an acoustically treated enclosure and will be designed to limit gas system noise emissions such that the Project will comply with the CEC's guidelines and County's noise requirements.

Plant Operation Noise Levels

To evaluate the noise environments associated with the Project, the Applicant has undertaken a noise prediction study to identify and incorporate special design features that will be added to the Project to help control noise emissions.

A noise model of the proposed Project has been developed based on the plant layout configurations and equipment information for the proposed facility. The noise model used source input levels derived from manufacturers' data, field surveys of similar equipment, and past experience with many comparable power plant projects. The noise emissions from the plant have been calculated at the residential receptors of potential concern, as well as at pertinent Site boundaries. The noise levels presented represent the anticipated steady-state level from the plant with essentially all equipment operating at full-load conditions.

Specifically, the study focused on the potential noise generated by the proposed two trains of gas-fired CTGs (GE LM 6000's), inlet chiller/cooling tower, fin/fan oil-to-air coolers, fuel gas

compressors, water pumps, power transformers, and other associated process and support equipment. The model divides the proposed facility into a list of individual point and area noise sources representing each piece of equipment that produces a significant amount of noise. The sound power levels representing the standard performance of each of these components are assigned based either on field measurements of similar equipment made at other existing plants, data supplied by manufacturers, or information found in the technical literature. Using these sound power levels to define the individual sources, the model calculates the sound pressure level that would occur at each defined receptor from each source given a set of sound propagation factors and attenuation effects that have been adopted from industry standards. These attenuation and reduction factors include losses from distance, air absorption, ground attenuation effects, and intervening barriers (both building and topography) are considered. The sum of all these individual source levels, after incorporating the propagation terms, is the total plant level at the selected receptor location. More details concerning the inputs and methodologies of the predictive noise modeling analyses are contained in Appendix 6.12-C.

The proposed plant was modeled as an open-air plant. That is, the base case noise model assumed no buildings or large enclosures around major equipment items. However, topographical features are important to this Site and the ridgelines around the Site were included in the noise prediction model. A reasonable attenuation factor for vegetation (e.g. trees and ground cover, both existing and future) was considered. Lastly, as is standard practice in the description of environmental noise, stable atmospheric conditions were assumed (suitable for reproducible measurements and that are favorable for noise to travel greater distances). These inherent conservative factors and assumptions result in a noise model that tends be biased to higher predicted values than would be expected in the actual environment around the Project.

The modeling study was based on the conservative scenario that the entire new Project could operate at maximum loads for an entire 24-hour period. This scenario is conservative because electricity demand normally ramps downward at night when commercial activities decline and when residential usage decreases (as people turn off lights, televisions, and appliances before going to sleep). For a peaking plant of this type, there would only be very rare instances wherein the CAISO would call for operations past 10 p.m. – estimated to be on the order of 40 hours per year over a 20- to 40-day period in the hottest months. The running of this plant beyond midnight would connote that there is a serious problem on the power grid and such late-night operations could be categorized as ‘exceedingly rare’ (to the point of ‘almost never’ occurring). Nevertheless, the modeling was performed assuming 24 hours of maximum loads to assure that even under this unusual condition, the Project will comply with the San Diego County noise ordinance requirements at all hours of the day and night, and will adhere to the CEC’s late-night noise guidelines (for those rare cases of peaking generation operations after 10 p.m.).

The modeling effort was repeated in an iterative fashion to analyze increasingly quiet configurations of plant equipment until a plant design was arrived at that was considered the feasibility limit for practical noise mitigation techniques and that resulted in compliance with the County’s regulations at the property line and with the CEC significant impact threshold. This feasibility-constrained array of noise control design features, as discussed in Section 6.12.6, was included in the plant noise modeling. The main noise control features are large sound walls

around each power generation train and sound walls around the fuel gas compressors. Specifically, CTG and SCR trains will each be inside of an open-top acoustic enclosure (three-sided, open to the west, and approximately 48 feet tall), the main chiller and cooling systems will also be inside an open-top acoustic enclosure (three-sided, open to the west, and approximately 48 feet tall), and the fuel gas compression and cooling systems will be inside a 24-foot high, three sided, open-toped enclosure; all to prevent the plant from creating noise impacts to receptors to the north, northeast, east, and southeast.

Compliance with each standard is discussed below.

CEC Requirement (+5 dB criterion)

The CEC has determined that a significant noise impact will occur if operational noise from a new facility increases existing late-night L90 noise levels by 10 or more dB at nearby residential areas (Baker, 1999, 2002, 2007). For levels between 5 and 10 dB above the existing late-night L90 environment, additional considerations are warranted to account for the number and type of potentially impacted land uses, the nature of the existing noise environment (as compared to the future environment), and other extenuating circumstances. For new facilities that increase the late-night L90 environment by 5 or less dB, as compared to the existing ambient conditions, noise impacts are considered to be less than significant. The results of the modeling described above as it relates to the CEC criterion are presented in Table 6.12-16. As this table indicates, noise increases due to the Project will be less than 5 dB at all of the surrounding residential locations with respect to the lowest, late-night residual (L_{90}) noise metric, with the critical receptor being Location LT-1. At this house, the closest to and in clear view of the Project site, the Project noise control design features (primarily the large sound walls) will reduce the plant noise additions to the very low ambient conditions such that the CEC's late-night standard can be met.

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Table 6.12-16 - Comparison of Predicted Noise Levels from Project Operations to Existing Ambient Sound Levels, with Respect to the CEC's +5 dB Criterion

RECEPTOR[A]	OTHER ID	MEAS LOCN	MEASURED DAYTIME L_{EQ}, DBA [FOR INFOR-MATION ONLY]	MEASURED DAYTIME L_{90}, DBA [FOR INFOR-MATION ONLY]	MEASURED LATE-NIGHT L_{EQ}, DBA [FOR INFOR-MATION ONLY]	MEASURED LATE-NIGHT L_{90}, DBA	CEC LATE-NIGHT L_{90}+5 STANDARD, DBA	NOISE CONTROL CASE 7 MODEL, DBA	NOISE CONTROL CASE 7 PLANT CONTRIBUTIONS + AMBIENT, DBA	NOISE CONTROL CASE 7 MODEL COMPARED TO CEC LATE-NIGHT L_{90}+5 STANDARD
LT-1	–	LT-1	35-38	30-35	30-33	27	32	31	32	at limit
ST-1	–	ST-1	54	36	59	33	38	24	34	under standard by 4 dB
ST-2	–	ST-2	46[b]	~34[b]	46[b]	~34[b]	~39	18	34	under standard by 5 dB
House B	–	–	<35[c]	32-35[c]	<30[c]	27-30[c]	~32-35	25	29-31	under standard by 3-4 dB
House C	–	–	<35[c]	32-35[c]	<30[c]	27-30[c]	~32-35	27	30-32	under standard by 2-3 dB

Notes:

a. April 2007 Ambient Survey Locations that are not residential areas (and, therefore, are not relevant to this assessment) are not listed
b. May have been artificially influenced by operations of a nearby portable generator
c. Estimated values; using measurement data from similar locations

San Diego County Noise Ordinance

The County of San Diego noise level limits for stationary sources were presented in Table 6.12-4. The pertinent and most restrictive limits with respect to the Project (assuming the capability of full-load operations around the clock) are the nighttime limits for Single-Family Residential zones (hourly L_{eq} of 45 dBA), for Multi-Family Residential zones (hourly L_{eq} of 50 dBA), and for Commercial zones (hourly L_{eq} of 60 dBA). It should be noted that these values are the nominal noise level limits. Per San Diego Code 36.404: "If the measured ambient level exceeds the applicable limit noted (in the 36.404 table) above, the allowable one hour average sound level shall be the ambient noise level."

These County noise level limits, which are the pertinent standards in this situation, must be met "at any point on or beyond the boundaries of the property on which the sound is produced", per Code Section 36.404. In discussions with DPLU staff in late 2007, the County nominated that the code requirements for noise compliance applied at the APN-26 *parcel* line (not at the SDG&E *property* boundary). Such an interpretation does not seem to be consistent with the above wording in County Code Section 36.404. Therefore, the Applicant is asserting that County Code noise compliance is relevant at the (SDG&E) property boundary. With this premise, the results of the modeling described above, as they relate to the San Diego Noise Standards, are presented in Tables 6.12-17 and 6.12-18 for the daytime and nighttime periods, respectively[7].

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[7] These tables also present information on the noise levels at the APN-26 parcel line locations, but for information only, not for compliance assessment.

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Table 6.12-17 - Comparison of Predicted Noise Levels from Project Ongoing Operations to County of San Diego DAYTIME Noise Level Limits

AREA	LOCATION	OTHER ID	MEAS LOCN	MEASURED DAYTIME L_{90}, DBA [FOR INFORMATION ONLY]	MEASURED DAYTIME L_{EQ}, DBA	NOMINAL COUNTY OF S.D. DAYTIME HOURLY L_{EQ} LIMIT, DBA	EFFECTIVE DAYTIME HOURLY L_{EQ} LIMIT (ADJUSTED FOR MEASURED AMBIENT), DBA	NOISE CONTROL CASE 7 MODEL, DBA	NOISE CONTROL CASE 7 PLANT CONTRIBUTIONS + AMBIENT, DBA	CHANGE COMPARED TO EXISTING CONDITIONS, DB	NOISE CONTROL CASE 7 MODEL COMPARED TO S.D. COUNTY DAYTIME LIMIT
Sensitive Receptor Locations	LT-1	--	LT-1	30-35	35-38	50	50	31	36-39	+1	under limit by 11 to 14 dB
	ST-1	--	ST-1	36	54	50	54	24	54	no change to existing conditions	no change to existing conditions
	ST-2	--	ST-2	~34[b]	46[b]	50	50	18	46	no change to existing conditions	no change to existing conditions
	House B	--		32-35[c]	<35[c]	50	50	25	<35	<+3	under limit by >15 dB
	House C	--		32-35[c]	<35[c]	50	50	27	<35	<+3	under limit by >15 dB
	Casino	--		ND	ND	55	55	17	ND	no change to existing conditions[d]	no change to existing conditions[d]
Property Boundary Locations	Property W	"M"		ND	ND	50	50	44	ND	ND	ND
	Property N	"B"	SLT-1	35	43	50	50	41	45	+2	under limit by 5 dB
	Property NE	"D"		ND	ND	50	50	21	ND	no change to existing conditions[d]	no change to existing conditions[d]
	Property E	--	SLT-2	48	53	50	53	22	53	no change to existing conditions	no change to existing conditions
	Property E	"E"	~SLT-4	~45[c]	~65[c]	50	~65	24	~65	no change to existing conditions	no change to existing conditions
	Property angle	"G"	~SLT-4	~45[c]	~65[c]	55	~65	45	~65	no change to existing conditions	no change to existing conditions
	Property angle	"H"	~SLT-4	~45[c]	~65[c]	55	~65	50	~65	no change to existing conditions	no change to existing conditions
	Property angle	"J"	SLT-8b	47	55	55	55	45	55	+0	at limit
Parcel Line Locations (for information)	APN-NW	"B"	SLT-1	35	43	[50][e]	[50][e]	41	45	+2	[under by 5 dB]
	APN-E		SLT-3	41	47	[50][e]	[50][e]	41	48	+1	[under by 2 dB]
	APN-SSE	"G"	~SLT-4	~45[c]	~65[c]	[55][e]	[~65][e]	45	~65	no change to existing conditions	no change to existing conditions
	APN-S		SLT-5	40	50	[50][e]	[50][e]	55	56	+6	[over by 6 dB]
	APN-SW		SLT-6	~38	~48[c]	[50][e]	[50][e]	64	64	+16	[over by 14 dB]
	APN-WSW		SLT-7	35	46	[50][e]	[50][e]	68	68	+22	[over by 18 dB]

Notes:

a. not used
b. May have been artificially influenced by operations of a nearby portable generator
c. Estimated values; using measurement data from similar locations
d. Although no measurement data is available, the extremely low plant contributions are judged to be negligible, compared to the estimated existing levels.
e. The County Code limits noise at the *property* boundary, not at the *parcel* boundary

Table 6.12-18 - Comparison of Predicted Noise Levels from Project Ongoing Operations to County of San Diego NIGHTTIME Noise Level Limits

AREA	LOCATION	OTHER DESIGNATION	MEAS LOCN	MEASURED LATE-NIGHT L_{90}, DBA [FOR INFORMATION ONLY]	MEASURED LATE-NIGHT L_{EQ}, DBA	NOMINAL COUNTY OF S.D. NIGHTTIME HOURLY L_{EQ} LIMIT, DBA	EFFECTIVE NIGHTTIME HOURLY L_{EQ} LIMIT (ADJUSTED FOR MEASURED AMBIENT), DBA	NOISE CONTROL CASE 7 MODEL, DBA	NOISE CONTROL CASE 7 PLANT CONTRIBUTIONS + AMBIENT, DBA	CHANGE COMPARED TO EXISTING CONDITIONS, DB	NOISE CONTROL CASE 7 MODEL COMPARED TO S.D. COUNTY NIGHTTIME LIMIT
Sensitive Receptor Locations	LT-1	--	LT-1	27	30-33	45	45	31	34-35	+2 to 4	under by 10 to 11 dB
	ST-1	--	ST-1	33	59	45	59	24	59	no change to existing conditions	no change to existing conditions
	ST-2	--	ST-2	~34[b]	46[b]	45	45	18	46	no change to existing conditions	no change to existing conditions
	House B	--		27-30[c]	<30[c]	45	45	25	<31	+1	under by 14 dB
	House C	--		27-30[c]	<30[c]	45	45	27	<32	+2	under by 13 dB
	Casino	--		ND	ND	50	50	17	ND	no change to existing conditions[d]	no change to existing conditions[d]
Property Boundary Locations	Property W	"M"		ND	ND	45	45	44	ND	ND	ND
	Property N	"B"	SLT-1	38	45	45	45	41	46	+1	over by 1 dB (due to ambient)
	Property NE	"D"		ND	ND	45	45	21	ND	ND	ND
	Property E	--	SLT-2	62	64	45	64	22	64	no change to existing conditions[d]	no change to existing conditions[d]
	Property E	"E"	~SLT-4	39	~60	45	60	24	~60	no change to existing conditions[d]	no change to existing conditions[d]
	Property angle	"G"	~SLT-4	39	~60	50	60	45	~60	no change to existing conditions	no change to existing conditions
	Property angle	"H"	~SLT-4	39	~60	50	60	50	~60	no change to existing conditions	no change to existing conditions
	Property angle	"J"	SLT-8b	46	54	50	54	46	55	+1	over by 1 dB (due to ambient)
Parcel Line Locations (for information)	APN-NW	"B"	SLT-1	38	45	[45][e]	[45][e]	41	46	+1	[over by 1 dB]
	APN-E		SLT-3	38	42	[45][e]	[45][e]	41	45	+3	[at limit]
	APN-SSE	"G"	~SLT-4	39	~60	[50][e]	[~60][e]	45	~60	no change to existing conditions	no change to existing conditions
	APN-S		SLT-5	45	53	[45][e]	[53][e]	55	57	+4	[over by 4 dB]
	APN-SW		SLT-6	43	~51	[45][e]	[~51][e]	64	64	+13	[over by 13 dB]
	APN-WSW		SLT-7	40	48	[45][e]	[48][e]	68	68	+20	[over by 20 dB]

Notes:

a. not used
b. May have been artificially influenced by operations of a nearby portable generator
c. Estimated values; using measurement data from similar locations
d. Although no measurement data is available, the extremely low plant contributions are judged to be negligible, compared to the estimated existing levels.
e. The County Code limits noise at the *property* boundary, not at the *parcel* boundary

As Table 6.12-17 shows, the future daytime conditions at actual receptor locations will typically experience no change relative to the existing conditions. At worst, there is predicted to be a 3 dB increase over existing conditions. In all cases, the future noise will comply with County standards at actual receptor locations. For property line locations, most locations are predicted to also have no change in the noise environment after the plant is on line. Further, the noise control features will allow compliance with the County Code at all property line locations, with point 'J' being the critical position (i.e. at the County limit).

Table 6.12-18 provides the future, predicted nighttime conditions relative to the County Code. As during the daytime, actual receptor locations will typically experience no change in the noise environment. The critical receptors, LT-1, may experience an increase from 2 to 4 dB, depending on the nighttime no-plant ambient L_{eq} levels. However, this location is predicted to be below the County standards by 10 or more dB. All other actual receptor locations will also comply with the County noise limit for residential property. For property line locations at night, the typical future conditions will have either no change from the current environment or, at worst, experience a 1 dB increase. Two locations, 'B' and 'J', are ostensibly shown to be just over the County limits, but this is so because of the ambient noise levels, not because of the predicted Project contributions (which are 4 and 8 dB below the existing conditions, respectively). As these locations, along with the other property line locations, do not have any sensitive receptors near them which could possibly be impacted by plant noise and as the Project noise control package will be refined during detailed design engineering, these two ostensive overage results are considered to be less than significant.

Thus, these tables indicate that the San Diego Noise Standards will be met at both surrounding sensitive land uses (i.e. actual noise receptor locations) and at the relevant property boundary (even though there are no receptors at these locations), while accounting for existing ambient noise environments (which are often considerably higher than the nominal noise level limits). Therefore, the Project will conform to the San Diego Noise Standards.

In summary, since the Project complies with the pertinent San Diego Standards as well as with the CEC's guidelines, it can be concluded that there are no residences, hospitals, libraries, schools, places of worship or other facilities where quiet is an important attribute of the environment where there is a potential significant impact from noise levels resulting from the Project's operations. These compliant conditions are graphically given in Figure 6.12-16, which shows the predicted noise level contours for the Project contribution into the surrounding areas.

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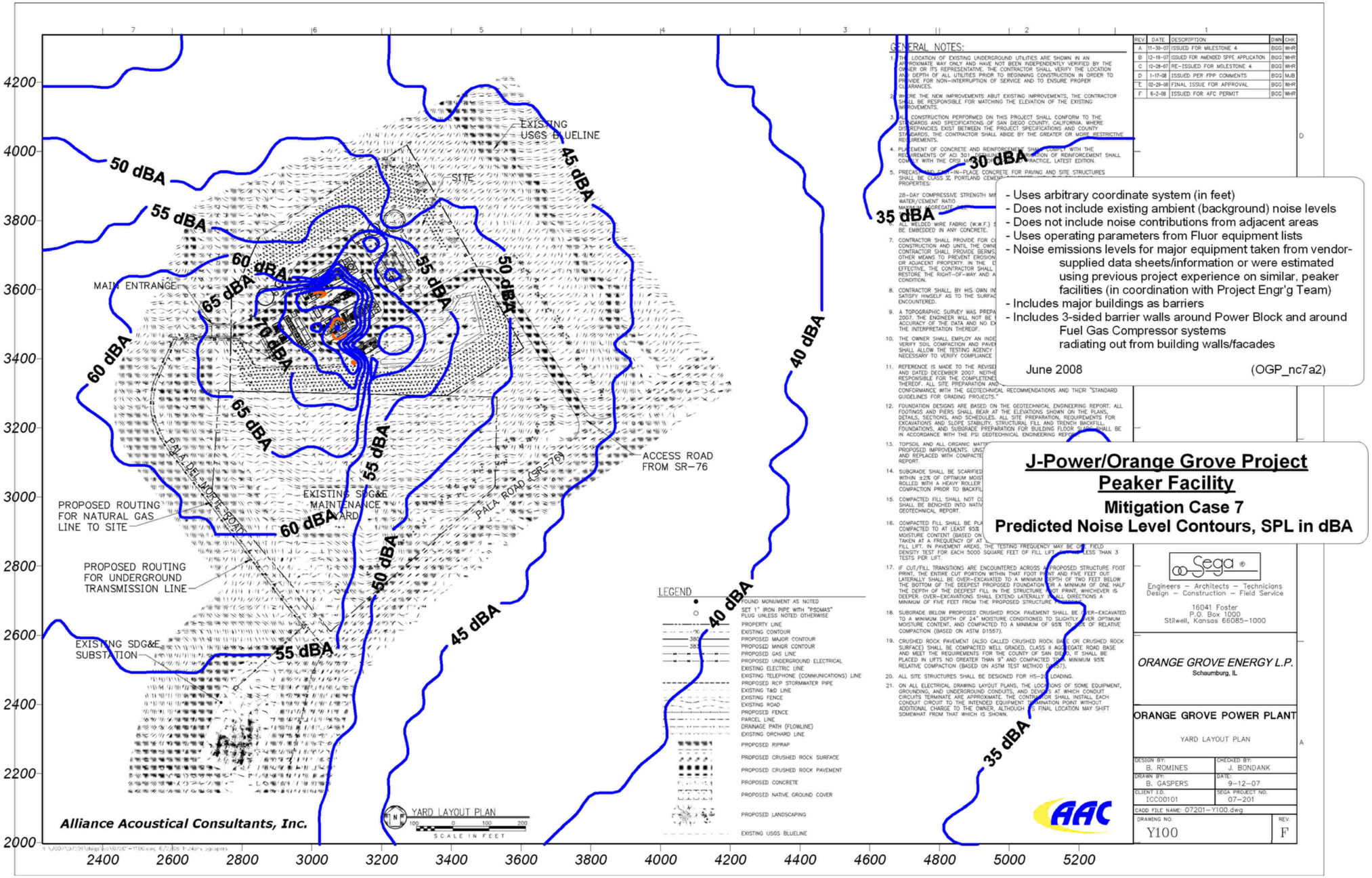
Figure 6.12-16 – Predicted Noise Level Contours in Surrounding Areas



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6.12.5.3.1 Tonal Noise

As a general rule, simple-cycle power plants that do not include noise controls in the exhaust gas path can possibly produce significant low-frequency noise that may be noticeable or objectionable at nearby receptor locations. However, for this Project, substantial silencing is planned for the SCR system which will preclude excessive exhaust path noise emissions from being released into adjacent areas. Therefore, at the monitoring locations modeled here, no significant tones are anticipated.

Other sources within the plant such as the combustion turbine inlets, transformers, pump motors, gearboxes, etc. have been known to sometimes produce audible tones. It is the Applicant's intention to anticipate the potential for audible tones in the design and specification of the plant's equipment and take necessary steps to prevent sources from emitting tones that might be disturbing at the nearest receptors.

6.12.5.3.2 Operations Vibration

Experience at similar facilities demonstrates a very low probability for either ground-borne or airborne-induced vibration impacts to surrounding land uses. The Project equipment that would be used in the proposed Project is well balanced and is designed to produce very low vibration levels throughout the life of the Project. An imbalance could contribute to ground vibration levels in the vicinity of the equipment. However, vibration-monitoring systems installed in the equipment are designed to ensure that the equipment remains balanced. Also, given the distances from the actual equipment to the nearest receptor locations, as well as the inherently low vibration levels from the plant's well-balanced machinery, ground-borne vibrations would not expected to be even detectable above the residual background vibration environment at the nearest receptors.

As mentioned above, the gas turbines exhausting into a SCR duct and then a stack can possibly produce low frequency noise, which is the main source of airborne-induced vibration of or in nearby structures. Given the Project's use of considerable exhaust path silencing, the airborne energy that might cause induced structural vibrations will be alleviated to the extent that airborne-induced vibrations are not expected to be above the threshold of detectability.

Thus, impacts from operations vibrations will be less than significant.

6.12.5.3.3 Water Supply

Two water pickup stations will be owned and operated by the FPUD that will be used to load water trucks to haul water to the Site as described in Section 2.6. The water haul routes are described in Section 2.6.2.4, and will primarily use Major Roads and Expressways with average daily traffic ranging from 18,981 to 23,977 vehicles per day. Only one short segment of the reclaim water haul route will utilize a collector road (Ammunition Road with an Average Daily Traffic of 12,430 vehicles per day) and a road that is not classified (Alturas Road, with an Average Daily Traffic of 3,948 vehicles per day). Water hauling will average approximately 0.4 truck for reclaim water and 0.9 truck for fresh water for each hour that the power plant operates

at full capacity at summer design conditions. The peak water hauling traffic will be approximately 1 truck per hour for the reclaim water and 1 truck per hour for the fresh water when the plant is operating, expected to be about 60 days per year or less. The water trucks to be used will be new vehicles purchased for the Project and will be equipped with mufflers. The water truck traffic will not be substantially different from the existing traffic on the roads to be used. Even for the smaller roads (Ammunition and Alturas), there is currently truck traffic on these roads and the addition of the average 0.4 truck per hour that the power plant operates, and the 1 truck per hour peak, will not be a substantial disruption. The water option agreement in Appendix 6.5-G includes enforceable requirements for the reclaim water haul route to keep the trucks out of residential neighborhoods where they might otherwise be disruptive. Considering these factors, the noise impact of water hauling during operations will be less than significant.

6.12.5.3.4 Cumulative Noise Impacts

The most prevalent existing noise in the area is from SR 76, even during late-night/early-morning hours. This source may actually provide beneficial masking of the proposed Project noise emissions, particularly during the busy daytime hours. Some future, proposed projects in the vicinity of the Project, such as the Pala Casino Expansion and the Warner Ranch Development, may increase traffic on SR 76 somewhat after the Project is operational, but such volume increases would not be expected to significantly change noise levels in the area.

Additionally, potential future noise sources near the Project site, which may contribute to cumulative sound levels in the local area, are summarized in Section 6.1.2. These future discretionary projects are expected to contribute negligible, if any, noise levels to the environment around the Project site as they are generally too far from the Project site or separated by substantial topographical characteristics (e.g. hillsides and ridgelines) or both. The closest potential project is the Prominence at Pala (see 6.1.2.10), but it is not considered reasonably foreseeable for the purposes of this cumulative impact analysis. Therefore, there are no known future noise sources in the San Diego/Pala area that will contribute to Project noise levels in a manner that would result in additional cumulative impact.

Based on the absence of other notable noise sources in the Pala area, which would be additive to Project noise, cumulative noise impacts for the Project are not considered significant.

6.12.6 Noise Design Features and Mitigation Measures

The following noise reduction design features are included in the Project to ensure meeting the appropriate noise criteria during normal operations.

- Housing the main power generation trains inside an open-top acoustic enclosure (three-sided, open to the west, and approximately 48 feet tall);
- Housing the chiller and main cooling systems inside an open-top acoustic enclosure (three-sided, open to the west, and approximately 48 feet tall);
- Implementation of appropriate silencing in the exhaust path within the SCR (pre-catalyst bed, post-catalyst bed, or in the stack);

- Low-noise sound level specifications for vent silencers; and
- Housing the fuel gas compressors and coolers inside an open-top acoustic enclosure (three-sided, open to the west, and approximately 24 feet tall).

The implementation and refinement of these design features during the detailed design process will result in the Project meeting the San Diego Noise Ordinance, as well as meeting the CEC's significance impact threshold. Consequently, no significant noise impacts during ongoing operations are expected and, thus, no mitigation measures are expected to be required. However, to confirm that noise impacts remain less than significant, the following noise reduction and monitoring program is included for the Project.

6.12.6.1 Noise Mitigation Measure #1

The Project design and implementation shall include noise reduction and noise control design features to the extent feasible ensure that operation of the Project will not exceed the effective noise standards of the County code while accounting for ambient noise conditions.

6.12.6.2 Noise Mitigation Measure #2

The Project shall establish a telephone number for use by the public to report any significant undesirable noise conditions associated with the construction and operation phases of the Project. If the telephone is not staffed 24 hours per day, the Project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the Project site during construction in a manner visible to passersby. This telephone number shall be maintained until the Project has been operational for at least 1 year.

6.12.6.3 Noise Mitigation Measure #3

Throughout the construction, and operation of the Project, the Project owner shall document, investigate, evaluate, and attempt to resolve all legitimate, Project-related noise complaints.

The Project or authorized agent shall:

- Use the Noise Complaint Resolution Form typically suggested by the CEC or functionally equivalent procedure to document and respond to each noise complaint.
- Attempt to contact the person(s) making the noise complaint within 24 hours.
- Conduct an investigation to attempt to determine the source of noise related to the complaint.
- If the noise complaint is legitimate, take all feasible measures to reduce the noise at its source.

6.12.6.4 Noise Mitigation Measure #4

Noisy construction work shall be restricted to the period from 7 a.m. to 7 p.m. on weekdays, unless otherwise permitted in accordance with San Diego Code Section 36.410. In no event shall construction noise cause offsite, average noise levels to be above 75 dBA at the property line of any property upon which a legal dwelling unit is located.

Construction equipment shall have appropriate silencing features or equipment installed and maintained during the course of the construction phase. For example, haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Stationary compressors and generators shall utilize noise-reduction enclosures or similar noise control features. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust braking shall be limited to emergencies.

6.12.6.5 Noise Mitigation Measure #5

Temporary silencers on air and steam discharge vents will be used during the commissioning and initial start-up phase. This will reduce noise from the few weeks of air and steam blow cleaning that only occurs during this part of the plant's life cycle.

6.12.6.6 Noise Mitigation Measure #6

A noise survey shall be performed within 90 days of the startup of commercial operations to confirm that the modeled noise levels are met. Any deficiencies shall be noted, and a schedule to correct them shall be developed. A copy of the report shall be provided to the CEC and the County of San Diego, which shall be kept apprised of progress made toward correcting any noise-related issues.

6.12.7 Involved Agencies and Agency Contacts

Agency contacts relative to noise issues are presented in Table 6.12-19.

Table 6.12-19 –Agency Contacts for Noise

AGENCY	AUTHORITY
Department of Planning and Land Use County of San Diego 5201 Ruffin Road, Suite B San Diego, California 92123 E. Quino (858) 694-8845	Compliance with County noise ordinances.

6.12.8 Noise-Related Permits and Permitting Schedule

There are no noise-related permits that are applicable to this Project.

6.12.9 References

Barnes, J.D., L.N. Miller, and E.W. Wood. 1976. *Prediction of Noise from Power Plant Construction*. Bolt Beranek and Newman, Inc. Cambridge, MA. Prepared for the Empire State Electric Energy Research Corporation, Schenectady, NY.

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United States Environmental Protection Agency (EPA). *Protective Noise Levels*. Office of Noise Abatement and Control. Report number EPA 550/9-79-100. Washington, D.C. 20460. 1978.