

## 6.12 NOISE

The Canyon Power Plant (CPP) will consist of a nominal 200-megawatt (MW) simple-cycle plant, using four natural gas-fired General Electric LM 6000PC Sprint combustion turbines and associated infrastructure. The project site is located at 3071 East Miraloma Avenue, in a City of Anaheim (COA)-designated industrial zone.

The CPP and associated construction laydown areas will be located on approximately 10 acres of disturbed land located at 3071 East Miraloma Avenue. Main access to the CPP site will be at the southeast corner of the project site from East Miraloma Avenue. A second gated entrance will be accessible via East Miraloma Avenue with a third gate off the alley to the east of the site. (Total land disturbance will be approximately 10 acres.)

The existing CPP site is predominantly paved (concrete and asphalt). Principal land use for the site was food catering for a fleet of approximately 75 to 100 trucks, formerly operated by Orange County Food Service. Onsite structures include a kitchen/warehouse building, maintenance garage (9 service bays), truck wash facility (5 bays), two ice manufacturing buildings, several storage sheds, and an outdoor truck repair shop which includes storage lockers and petroleum products, all of which will be demolished as a part of the CPP project.

The following activities are not part of the CPP project:

- Three residential houses along East Miraloma Avenue have recently been removed and are not a part of this Application for Certification (AFC). The COA Risk Manager and Fire Department determined that the residential units posed security and fire risks, and therefore they were removed. A letter from the COA Risk Manager to the Public Utilities Department is included in Appendix Q.
- Soil remediation activities associated with Phase I, Phase II, and Supplemental Phase II reports. The COA, now as owner of the property, has determined that it will conduct any soil remediation activities to limit its environmental liability for future uses of the site. These activities will occur regardless of whether the CPP project obtains a CEC license.
- Installation of a temporary, 8-foot-high security fence around the perimeter of the entire 10-acre site.
- General maintenance activities including site cleanup and trash removal.

The project will include the construction and/or installation of the following components:

- **Proposed CPP site.** In addition to the four natural gas-fired GE LM 6000PC Sprint gas turbines, the plant will include generator step-up transformers (GSUs), a 69 kilovolt (kV) switchyard, onsite fuel gas compressors, a gas pressure control and metering station, a packaged chilled water system for combustion turbine engine (CTG) power augmentation

with associated heating ventilation and air conditioning (HVAC)-type four-cell cooling tower, selective catalytic reduction system (SCR) emission control systems, and other associated plant infrastructure.

- **Gas pipeline.** Natural gas will be provided via a new 3,240-foot-long, 12-inch, and 350 pounds per square inch gauge (psig) gas line owned and maintained by SoCal Gas Company (SCGC), which will be connected to new onsite fuel gas compressors that will be part of the CPP facility. From the CPP site, this new pipeline will run approximately 580 feet east in East Miraloma Avenue to Kraemer Boulevard, then north 2,660 feet in Kraemer Boulevard to East Orangethorpe Avenue to connect into SCGCs transmission line L-1218 in East Orangethorpe Avenue. (Total land disturbance will be 0.219 acre.)
- **Process water.** Process water for the project will be recycled water supplied from the Orange County groundwater replenishment system (GWRS) via a new 2,185-foot-long, 14-inch pipeline utilizing a new offsite booster pump station. The water pipeline will run east of the site on the north side of East Miraloma Avenue for 1,850 feet to the new pumping station located north of the curb in the COA-owned easement of East Miraloma Avenue, then north 210 feet in new easement from the Orange County Water District (OCWD), then 125 feet easterly in new easement to the GWRS line on the western side of the Carbon Canyon Diversion Channel. There, it will connect to the 60-inch-diameter GWRS recycled water line at an existing 36-inch stub up. (Total land disturbance for both line and pumping station will be 0.246 acre.)
- **Electrical interconnection.** Underground 69 kV cables will connect from GSUs to the onsite switchyard, which will use gas-insulated switchgear (GIS). There will be four new underground 69 kV circuits leaving the site. Two will proceed underneath and to the south side of East Miraloma Avenue approximately 100 feet to rise up and connect to the existing 69 kV overhead Vermont-Yorba lines via two new transition structures. The second two 69 kV underground circuits will proceed eastward approximately 4,000 feet in East Miraloma Avenue, turn south on Miller, then proceed approximately 3,000 feet to connect to the Dowling-Yorba 69 kV line at East La Palma Avenue. (Total land disturbance for both sets of cables will be 0.489 acre.)
- **Communications.** Fiber optic cable will run in a common trench with the approximately 7,000-foot 69 kV electric cables, where it will tie into existing underground fiber optic cable for the supervisory control and data acquisition (SCADA) system.

In accordance with California Energy Commission (CEC) regulations, this section describes the existing noise environment on site and in the vicinity of the plant, and assesses potential noise impacts associated with the proposed project. Noise-sensitive areas that may be affected by noise are identified, as well as the laws, ordinances, regulations, and standards that regulate noise levels at those areas. The following discussion describes the results of a detailed site reconnaissance, sound level measurements, acoustical calculations, and

assessment of potential noise impacts. Where appropriate, mitigation measures are proposed to reduce potential project-related noise impacts to acceptable levels.

### 6.12.1 Affected Environment

#### 6.12.1.1 Fundamentals of Acoustics

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound typically associated with human activity and that interferes with or disrupts normal activities. The human environment is characterized by a certain consistent noise level which varies with each area. This is called ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. The average person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness; this relation holds true for sounds of any loudness. Sound levels of typical noise sources and environments are provided in Table 6.12-1.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels. If a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example, 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz. However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called

**TABLE 6.12-1  
SOUND LEVELS OF TYPICAL NOISE SOURCES AND NOISE ENVIRONMENTS**

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130 Decibels	64 times as loud
Commercial Jet Takeoff (200 ft)		120 Decibels	32 times as loud <b>Threshold of Pain</b>
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110 Decibels	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100 Decibels	8 times as loud <b>Very Loud</b>
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90 Decibels	4 times as loud
Garbage Disposal (3 ft)	Higher Limit of Urban Ambient Sound	80 Decibels	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)		70 Decibels	Reference Loudness <b>Moderately Loud</b>
Normal Conversation (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60 Decibels	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50 Decibels	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40 Decibels	1/8 as loud <b>Quiet</b>
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30 Decibels	1/16 as loud
	Broadcast and Recording Studio	20 Decibels	1/32 as loud <b>Just Audible</b>
		10 Decibels	1/64 as loud
		0 Decibels	1/128 as loud <b>Threshold of Hearing</b>

Source: Compiled by Kimley-Horn and Associates, Inc.

A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the “A-weighting” frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Because community noise fluctuates over time, a single measure called the Equivalent Sound Level ( $L_{eq}$ ) is often used to describe the time-varying character of community noise. The  $L_{eq}$  is the energy-averaged A-weighted sound level during a measured time interval, and is equal to the level of a continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the  $L_{max}$  and  $L_{min}$  indicators, which represent the root-mean-square maximum and minimum noise levels obtained during the measurement interval. The  $L_{min}$  value obtained for a particular monitoring location is often called the “acoustic floor” for that location.

To describe the time and varying character of environmental noise, the statistical noise descriptors  $L_{10}$ ,  $L_{50}$ , and  $L_{90}$  are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with  $L_{10}$  typically describe transient or short-term events, whereas levels associated with  $L_{90}$  describe the steady-state (or most prevalent) noise conditions.

Another sound measure known as the Community Noise Equivalent Level (CNEL) is an adjusted average A-weighted sound level for a 24-hour day. It is calculated by adding a 5-dB adjustment to sound levels during evening hours (7:00 p.m. to 10:00 p.m.) and a 10-dB adjustment to sound levels during nighttime hours (10:00 p.m. to 7:00 a.m.). These adjustments compensate for the increased sensitivity to noise during the typically quieter evening and nighttime hours. Day night average sound level ( $L_{dn}$ ) is a similar measure which does not add an adjustment to the evening hours.

Some land uses are considered sensitive to noise. Noise-sensitive areas (NSAs) are land uses associated with indoor and/or outdoor activities that may be subject to stress and/or significant interference from noise. NSAs often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. Industrial, commercial, and agricultural land uses are generally considered not sensitive to noise.

#### **6.12.1.2 Existing Conditions**

**6.12.1.2.1 Site Description.** The project would be constructed on a site consisting of approximately 10 acres located near the intersection of East Miraloma Avenue and Kraemer Boulevard. The site has commercial and light industrial uses. The area is within the City of Anaheim (COA) Specific Plan No. 94-1 area and is zoned industrial. The northern portion of the property is paved and used for parking and open-air storage. The surrounding area is

commercial and light industrial. Adelphia has a communication tower that is approximately 60-feet tall located within the parcel immediately west of the site. A fast-food restaurant is located at the northwest corner of Kraemer Boulevard and East Miraloma Avenue. The closest NSAs are single-family residences, located approximately between 1,200- to 2,130-feet from the center of the site.

**6.12.1.2.2 Ambient Noise Survey.** A series of sound level measurements was conducted on August 22 and 23, 2007. The purpose of the measurements was to quantify the existing noise environment in the vicinity of the proposed project and to characterize NSAs that may be exposed to sound level increases as a result of the project. Measurement locations were near the closest residential locations, as detailed below:

**ML1.** This location is approximately 1,200 feet west of the center of the site. There is one single-family residence located near the measurement location. The site is being redeveloped for commercial use, but a caretaker unit will remain. The measurement was conducted in an open area directly west of 2983 East Miraloma Avenue in the COA. A 25-hour sound level measurement was performed from 4:00 p.m. on August 22, 2007 to 5:00 p.m. on August 23, 2007.

The hourly  $L_{eq}$  at ML1 ranged from 42 to 90 dBA (average 62 dBA). However, with the exception of the 90 dBA  $L_{eq}$  which occurred between 7:00 a.m. and 8:00 a.m., the  $L_{eq}$  did not exceed 72 dBA. The 90 dBA  $L_{eq}$  hour was assumed to be caused by construction activity or an emergency vehicle, due to the corresponding high  $L_{max}$ . The hourly  $L_{90}$  ranged from 42 to 58 dBA (average 52 dBA). The lowest four contiguous hour average  $L_{90}$  during the 25-hour period was 43 dBA (1:00 a.m. to 5:00 a.m.). Refer to Table 6.12-2 for further details.

**ML2.** This location is approximately 2,130 feet east of the center of the site. There is one single-family residence located near the measurement location. The measurement was conducted in an open area directly west of 3233 East Miraloma Avenue in the COA. The location was monitored for one hour in each of the daytime, evening, and nighttime periods during the time frame of 7:00 p.m. on August 22, 2007 to 1:00 p.m. on August 23, 2007.

The hourly  $L_{eq}$  at ML2 ranged from 57 to 70 dBA (average 64 dBA) and the hourly  $L_{90}$  ranged from 45 to 53 dBA (average 50 dBA). Refer to Table 6.12-3 for further details.

**ML3.** This location is approximately 1,725 feet south of the center of the site. There is one single-family residence located near the measurement location. The measurement was conducted near 3030 Coronado Avenue in the COA. The location was monitored for one hour in each of the daytime, evening, and nighttime periods during the time frame of 8:00 p.m. on August 22, 2007 to 2:05 p.m. on August 23, 2007.

The hourly  $L_{eq}$  at ML3 ranged from 55 to 65 dBA (average 53 dBA) and the hourly  $L_{90}$  ranged from 49 to 54 dBA (average 52 dBA). Refer to Table 6.12-3 for further details.

**TABLE 6.12-2  
25-HOUR SOUND LEVEL MEASUREMENT AT ML1 (DBA)**

Time	L <sub>eq</sub>	L <sub>min</sub>	L <sub>max</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>90</sub>
16:00 – 17:00	64.2	51.6	80.6	67.2	61.6	56.3
17:00 – 18:00	64.2	50.8	85.0	66.4	40.8	55.3
18:00 – 19:00	61.9	49.9	77.6	64.9	59.1	53.4
19:00 – 20:00	59.0	50.6	71.0	62.7	55.9	53.4
20:00 – 21:00	59.0	49.4	83.7	60.1	53.8	52.3
21:00 – 22:00	57.1	47.9	73.3	60.3	52.4	51.2
22:00 – 23:00	56.3	47.4	72.0	59.8	52.5	49.8
23:00 – 00:00	53.8	44.5	74.5	57.5	48.7	49.9
00:00 – 01:00	56.2	43.0	76.5	58.2	46.7	45.7
01:00 – 02:00	49.2	41.5	69.9	48.8	43.8	44.5
02:00 – 03:00	51.6	41.0	72.9	51.2	43.1	42.3
03:00 – 04:00	53.5	40.7	70.5	57.6	45.9	41.6
04:00 – 05:00	54.2	42.5	75.0	57.3	46.4	43.5
05:00 – 06:00	58.4	44.8	77.1	62.2	54.2	47.7
06:00 – 07:00	63.6	47.2	77.8	66.9	60.4	52.6
07:00 – 08:00	89.5	51.7	124.0	71.4	64.3	57.9
08:00 – 09:00	71.5	51.8	89.5	73.8	64.7	58.1
09:00 – 10:00	65.1	49.4	80.7	69.7	61.8	55.5
10:00 – 11:00	63.5	48.1	79.8	67.3	59.6	53.2
11:00 – 12:00	64.5	48.3	87.8	67.5	59.9	53.7
12:00 – 13:00	63.6	50.5	80.7	66.7	59.6	55.3
13:00 – 14:00	65.4	52.2	93.4	66.9	60.4	56.4
14:00 – 15:00	63.3	52.0	81.0	66.7	60.3	56.0
15:00 – 16:00	64.4	50.2	81.3	67.7	61.5	56.6
16:00 – 17:00	65.6	51.0	83.7	68.4	62.4	56.8

## Notes:

Measurements conducted on August 22-23, 2007.

CNEL = 76 dBA

Average L<sub>eq</sub> = 62 dBA

**ML4.** This location is approximately 1,850 feet north of the center of the site. There is one single-family residence located near the measurement location. The measurement was conducted in an open field directly south of 2997 La Jolla Avenue in the City of Placentia. The location was monitored for one hour in each of the daytime, evening, and nighttime periods during the time frame of 9:00 p.m. on August 22, 2007 to 3:10 p.m. on August 23, 2007.

**TABLE 6.12-3  
SHORT-TERM SOUND LEVEL MEASUREMENTS (DBA)**

Measurement Location	Time	L <sub>eq</sub>	L <sub>min</sub>	L <sub>max</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>90</sub>
ML2	12:00 – 13:00	69.5	50.1	81.7	72.7	64.9	53.4
	18:55 – 19:55	64.8	49.7	88.4	69.1	55.8	51.6
	00:00 – 01:00	57.4	44.1	81.9	58.7	50.0	44.6
ML3	13:05 – 14:05	64.5	53.5	75.2	67.8	60.9	54.2
	20:00 – 21:00	58.6	53.1	74.8	61.2	55.6	54.3
	02:10 – 03:10	54.8	47.6	75.8	54.8	49.5	48.8
ML4	14:10 – 15:10	52.4	47.7	68.0	53.4	50.9	49.5
	21:05 – 22:05	56.8	46.8	72.5	59.4	49.9	48.3
	01:05 – 02:05	41.3	39.5	53.0	42.0	40.7	40.2

## Notes:

Measurements conducted on August 22-23, 2007.

Average wind conditions were 3 to 9 miles per hour from the south and southwest. Daytime temperatures averaged 81°F, with an average relative humidity of 51 percent. Evening temperatures averaged 72°F, with an average relative humidity of 70 percent. Nighttime temperatures averaged 70°F, with an average relative humidity of 72 percent. No precipitation occurred during the survey.

The hourly L<sub>eq</sub> at ML4 ranged from 41 to 57 dBA (average 50 dBA) and the hourly L<sub>90</sub> ranged from 40 to 50 dBA (average 46 dBA). Refer to Table 6.12-3 for further details.

**6.12.1.2.3 Instrumentation.** One Larson Davis Model 720 American National Standards Institute (ANSI) Type 1 Integrating Sound Level Meter (SLM) was used to conduct the 25 consecutive one-hour measurements at ML1. One Rion Model NA-28 SLM was used to conduct the one-hour measurements at ML2, ML3, and ML4. The Model NA-28 meter was mounted on a tripod approximately 5 feet above the ground to simulate the average height of the human ear. The meters were calibrated before and after the measurement periods.

### **6.12.1.3 Local Land Use and Noise Sources**

Surrounding land uses include commercial and light industrial. The project site and the surrounding area in the COA are located within the Specific Plan No. 94-1 known as the Northeast Industrial Area and are zoned for industrial use. Surrounding areas to the north and west are located with the City of Placentia; these areas are zoned for manufacturing and residential use.

The primary noise source for all sites was traffic on local roadways. Other sources included activities at industrial shops, activities at the nearby night club, landscaping activities, HVAC systems, activities at nearby loading docks, trains with horns, aircraft and helicopter overflights, public address systems, and dogs barking.

#### **6.12.1.4 Sound Level Design Goals**

The California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified and that such impacts be eliminated or mitigated to the extent feasible. The CEQA guidelines (California Code of Regulations, Title 14, Appendix G, Section XI) set forth some characteristics that may signify a potentially significant impact. Specifically, a significant effect from noise may exist if a project would result in:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels
- Substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- Substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

**6.12.1.4.1 California Energy Commission.** The CEC staff, in applying item 3 from Section 6.12.1.4 of this document to the analysis of this and other projects, has concluded that a potential for a significant noise impact exists where the noise of the project plus the background exceeds the background by more than 5 dBA at the nearest sensitive receptor, including those receptors that are considered a minority population. CEC staff considers it reasonable to assume that an increase in background noise levels up to 5 dBA in a residential setting is not significant; an increase of more than 10 dBA is clearly significant. An increase between 5 and 10 dBA should be considered adverse, but may be either significant or not significant, depending on the particular circumstances of a case. Factors to be considered in determining the significance of an adverse impact as defined above include:

- The resulting noise level
- The duration and frequency of the noise
- The number of people affected
- The land use designation of the affected receptor sites
- Public concern or controversy as demonstrated at workshops or hearings, or by correspondence

Noise due to construction activities is usually considered to be insignificant in terms of CEQA compliance if:

- The construction activity is temporary
- Use of heavy equipment and noisy activities is limited to daytime hours
- All industry-standard noise abatement measures are implemented for noise-producing equipment

CEC staff uses the above method and threshold to protect the most sensitive populations including the minority population.

**6.12.1.4.2 Local.** As discussed in Section 6.70.010 of the City of Anaheim Code of Ordinances and referenced in the Noise Element to the General Plan, no person within the City shall create any sound radiated for extended periods from any premises which produces a sound pressure level at any point on the property line in excess of 60 dBA. However, for this project, the COA has defined the property line noise level limit to be 65 dBA. A letter from the COA granting the variance is included in Appendix G. Noise created by temporary construction is exempt from this property line noise limit during the daytime hours of 7:00 a.m. to 7:00 p.m. The Noise Element requires that construction noise equipment operate with mufflers and intake silencers and encourages the use of noise barriers for use within 100 feet of existing residences.

As discussed in the Chapter 23.76 of the City of Placentia Municipal Code, a project cannot cause the exterior sound level in residential zones to exceed to 55 dBA during daytime hours and 50 dBA during nighttime hours; 65 dBA at anytime in commercial zones; and 70 dBA at anytime in industrial zones. Noise created by temporary construction noise is exempt from these noise limits during the acceptable construction activity hours. Section 23.81.170 of the Municipal Code defines the acceptable construction activity hours to be 7:00 a.m. to 7:00 p.m. on weekdays, 9:00 a.m. to 6:00 p.m. on Saturdays, and is prohibited on Sundays and holidays.

The City of Placentia Noise Element to the General Plan limits construction noise to 75 dBA for any 1-hour period and prohibits operation of construction equipment from 6:00 p.m. to 7:00 a.m. The Noise Element also states outdoor limits of 55 dBA for residential areas, 60 dBA for residential areas adjacent to commercial or industrial areas, 60 dBA for commercial areas, and 70 dBA for industrial areas. The Noise Element was adopted August 6, 1974, and is considered to be obsolete in comparison to the Municipal Code; therefore, the noise limits for construction noise and property line limits presented within the Municipal Code are assumed to be the applicable limits for all properties within the City of Placentia.

**6.12.1.4.3 Summary of Design Goals.** Generally, the design basis for noise control is the minimum, or most stringent, noise level required by any of the applicable laws, ordinances, regulations, and standards (LORS). Therefore, noise from this project at each NSA is evaluated against the CEC limit, where the project plus background level is considered significant if it exceeds the background level by 5 dBA or more at the NSA. Refer to Table 6.12-4.

**TABLE 6.12-4  
PROJECT DESIGN NOISE LEVELS**

NSA	Ambient Background Noise Level	Background Noise Level + 5 dBA	Project Noise Level Limit Proposed
ML1	43 dBA <sup>1</sup>	48 dBA	46 dBA
ML2	45 dBA <sup>2</sup>	50 dBA	48 dBA
ML3	49 dBA <sup>2</sup>	54 dBA	52 dBA
ML4	40 dBA <sup>2</sup>	45 dBA	43 dBA

<sup>1</sup> Average of 4 quietest consecutive nighttime L<sub>90</sub> measurements.

<sup>2</sup> Lowest measured L<sub>90</sub>.

Additionally, in order to comply with the COA noise requirements, the project must comply with the property line noise limit of 65 dBA.

#### **6.12.1.5 Noise Prediction Modeling of Operational Noise**

In order to evaluate the expected noise emissions of the facility and identify the need for noise control measures, a noise modeling study of the plant has been performed. The Cadna/A Noise Prediction Model was used to estimate the project-generated A-weighted sound level at the project property lines and the four closest NSAs. Cadna/A is a Windows-based software program that predicts and assesses noise levels near industrial noise sources and is based on ISO 9613-2 standards. The model uses industry-accepted propagation algorithms and accepts sound power levels (in dB re 1 picowatt) provided by the equipment manufacturer. The calculations account for classical sound wave divergence, plus attenuation factors resulting from air absorption, basic ground effects, and barrier/structure shielding. Air absorption was under “standard day” conditions of 59°F and 70 percent relative humidity. Major onsite buildings, tanks, and large equipment were included as barriers. The 20-foot-high wall around the perimeter of the site and the 12-foot-high wall on the south and west sides of the fuel gas compressor area were included in the model. In addition, offsite noise attenuating structures such as buildings located between the project site and the NSAs were included in the model.

Calculations were performed using linear octave band sound power levels as inputs from each noise source. The model outputs are in terms of octave band and overall A-weighted sound pressure levels. The modeled noise sources and source sound levels are summarized in Table 6.12-5. Project noise control features are summarized in Table 6.12-6. The sound power levels for each equipment component are based on manufacturer's data, field measurements of similar equipment, or information from various technical reports. The project site configuration was imported into Cadna/A from the project CAD files. The plant was assumed to operate 24 hours per day; therefore, the noise output would be constant regardless of time of day.

### 6.12.2 Environmental Consequences

Noise would be produced during construction of the project as well as during operation of the CTGs and auxiliary support equipment. Potential noise impacts from both onsite and offsite activities are assessed in this section. To determine the significance of project-generated increases in noise levels, significance criteria were used. Impacts were considered significant if:

- Project operation would conflict with local LORS
- Project operation would result in an increase of more than 5 dBA at NSAs
- Project construction was not temporary
- Use of heavy construction equipment and noisy activities was not limited to daytime hours
- Use of all feasible construction noise abatement measures was not implemented

**6.12.2.1.1 Construction Noise.** Construction at the project site would result in a short-term temporary increase in the ambient noise level near the construction activity. The magnitude of the increase would depend on the type of construction activity, the noise levels generated by various pieces of construction equipment, the duration of the construction phase, and the distance between the noise sources and receiver. Table 6.12-1 shows average noise levels generated by individual pieces of construction equipment (U.S. Environmental Protection Agency [USEPA], 1972).

Based on typical construction sequences, phases, specific equipment, and usage durations, projected construction noise levels are predicted to range from approximately 37 to 48 dBA at nearby residential receivers.

Construction would occur during the daytime hours (6:00 a.m. to 8:00 p.m. on weekdays and 9:00 a.m. to 6:00 p.m. on Saturdays). Moreover, all feasible construction noise abatement

**TABLE 6.12-5  
EQUIPMENT SOUND POWER LEVELS**

Noise Source	Sound Power Level (dB) at Octave Band Center Frequency (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	A-Wt
Cooling Tower	-	104	100	93	91	92	90	88	87	97.2
Step-up Transformer	69.3	79.4	79.8	74.2	71.7	72.2	66.9	63.8	43.9	76.0
Fuel Gas Compressor	58.4	71.2	81.5	93.1	101.7	100.9	103.3	103.2	99.1	109.1
Fin Fan Cooler	58.4	71.2	81.5	93.1	101.7	100.9	103.3	103.2	99.1	109.1
Combustion Air Inlet Filter	102	102	97	106	102	97	90	85	72	103.0
Combustion Air Inlet House Shell	107	105	104	85	75	75	75	78	80	89.9
Combustion Air Inlet Silencer Shell	99	96	88	87	87	89	90	85	78	94.6
CTG	107	103	98	92	82	78	81	80	80	89.7
CTG Base Skid	98	100	98	92	91	83	83	86	80	93.1
CTG Exhaust	103	104	96	91	77	75	74	68	59	86.3
CTG	107	106	106	94	89	90	84	77	77	95.1
CTG Base Skid	-	89	94	77	73	78	82	63	40	85.5
Generator Inlet Vent Fan Motor and Shell	98	89	98	114	97	97	92	84	75	106.5
Generator Cooling Air Exhaust	99	96	109	103	93	100	99	100	89	105.9
Generator Cooling Air Exhaust Shell	90	89	100	92	75	67	61	49	37	86.9
Enhanced Sprint Assembly	82	82	85	87	89	90	88	83	76	94.1
Water Injection Skid	81	88	86	81	84	82	80	75	70	86.9
Gas Filter Skid	109	105	102	100	94	91	92	90	90	99.3
SCR Casing	116	113	109	108	98	86	82	77	59	101.7
SCR Stack	131.9	129.9	121.9	114.9	102.9	88.9	85.9	88.9	80.9	110.7
Water Pump	-	-	-	-	-	-	-	-	-	95
Aux. Transformer - 2500 kVA	-	-	-	-	-	-	-	-	-	73
Aux. Transformer - 7500 kVA	-	-	-	-	-	-	-	-	-	78
Ammonia Dilution Skid	-	-	-	-	-	-	-	-	-	96
Air Fans	-	-	-	-	-	-	-	-	-	96
Air Compressor Skid	-	-	-	-	-	-	-	-	-	96

measures would be implemented. Temporary construction noise is considered exempt from applicable noise limits in both the COA and Placentia.

**TABLE 6.12-6  
PROJECT NOISE CONTROL MEASURES**

Noise Control Measure	Insertion Loss (dB) at Octave Band Center Frequency (Hz)								
	31.5	63	125	250	500	1000	2000	4000	8000
Cooling Tower Super Low Sound Fan	-	7	12	7	13	4	2	2	1
Stack Silencer	2	4	9	17	23	23	19	9	1
Generator Exhaust Silencer	15	20	21	21	23	17	21	16	19
Generator Cooling Air Exhaust Silencer	24	27	30	32	41	50	59	67	71
Turbine Enclosure	9	8	26	18	25	25	25	31	40
Auxiliary Skid Enclosure	3	5	7	10	13	15	17	18	19
Water Injection Skid Enclosure	5	11	16	21	22	22	24	25	27

**6.12.2.1.2 Pipeline Construction.** Construction of the pipeline would result in a short-term temporary increase in the ambient noise level at the NSAs. The magnitude of the impact would depend on the type of construction activity, noise level generated by various pieces of construction equipment, and distance between the noise source and receiver. The pipeline would be constructed in segments. Approximately 50 linear feet of pipeline would be constructed per day. Therefore, the increase in construction noise at any given location would be limited to 3 to 5 days. Normal construction will most likely be scheduled between 6 a.m. and 8 p.m., Monday through Friday. Temporary construction noise is considered exempt from applicable noise limits in the cities of Anaheim and Placentia.

**6.12.2.1.2 Operational Noise at Noise Sensitive Areas.** Project operation would involve the introduction of noise-generating equipment. The overall noise level generated would depend upon the physical layout of the facility, noise generation of equipment, numbers of individual equipment units, and the noise control measures incorporated into the facility design. The modeled noise-producing equipment is listed in Table 6.12-5. Project noise control measures include acoustical enclosures with vent silencers around the combustion turbines and generators.

Acoustical calculations were performed to estimate the sound level from the project at the project property lines and the NSAs, identified as ML1, ML2, ML3, and ML4 on Figure 6.12-1.

Project-related noise contours are depicted in 5-dBA increments on and near the project site on Figure 6.12-2. The estimated sound levels at the project property lines are shown in Table 6.12-7.

The project sound level at or near the project property lines ranges from approximately 46 dBA  $L_{eq}$  to 64 dBA  $L_{eq}$ .

**TABLE 6.12-7  
PROJECT-GENERATED NOISE LEVEL INCREASE**

NSA	Source-to-Receptor Distance	Ambient Background Noise Level <sup>1</sup>	Project-Generated Noise Level	Background + Project Noise Level	Delta
ML1	1,200	43 dBA <sup>1</sup>	42 dBA	46 dBA	3 dBA
ML2	2,130	45 dBA <sup>2</sup>	45 dBA	48 dBA	3 dBA
ML3	1,725	49 dBA <sup>2</sup>	42 dBA	50 dBA	1 dBA
ML4	1,850	40 dBA <sup>2</sup>	38 dBA	42 dBA	2 dBA

<sup>1</sup> Average of 4 quietest consecutive nighttime L<sub>90</sub> measurements

<sup>2</sup> Lowest measured L<sub>90</sub>

Delta = Increase in sound level as a result of the project.

**6.12.2.1.3 Ground-borne Noise Levels.** Operation of similar facilities has not resulted in ground-borne vibration impacts. The equipment that would be used in the project is well-balanced and 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. Should an imbalance occur, the event would be detected and the equipment would automatically shut down.

**6.12.2.1.4 Worker Exposure to Noise.** Occupational noise exposure of employees within the plant cannot be evaluated until the project has been constructed and employee jobs and routines determined. The Project Owner would conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey would be conducted after the facility is in full operation, and would be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations, Section 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910.

#### **6.12.2.1 Cumulative Impacts**

There are no other major known planned development projects in the vicinity of the project that would contribute to a significant cumulative noise impact.

#### **6.12.2.2 Mitigation Measures**

The proposed project complies with applicable LORS as proposed. No additional noise mitigation measures are required. Project noise control measures such as acoustical enclosures are detailed in Table 6.12-6.

**6.12.2.3 Laws, Ordinances, Regulations, and Standards**

This section describes the LORS for the control of noise, as also summarized in Table 6.12-8.

**6.12.2.5.1 Federal.** There are no noise-related federal LORS that affect this project. However, there are guidelines at the federal level that direct the consideration of a broad range of noise issues as listed below:

- National Environmental Policy Act (42 U.S. Code [USC] 4321, et seq.) (Public Law [PL]-91-190)
- Noise Control Act of 1972 (42 USC 4910)

The USEPA has not promulgated standards or regulations for environmental noise generated by power plants. However, the USEPA has published a guideline (EPA Levels Document, Report No. 556/9-74-664) containing recommendations for noise levels affecting residential land use. The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues, and therefore should not be construed as standards or regulations.

**6.12.2.5.2 State of California.**

**California Energy Commission.** Under CEC siting requirements, new-source noise impacts at residential receptors are evaluated with respect to the pre-existing background noise level or specific local performance standards. The CEC typically defines an area as negligibly impacted by a project where operation potentially increases existing ambient noise levels by 5 dBA or less. The CEC defines the ambient background noise level as the lowest four-consecutive-hour logarithmic-average  $L_{90}$  at a 25-hour measurement site, and the lowest  $L_{90}$  at a short-term measurement site.

The CEC also considers construction noise as typically insignificant if all of the following are true:

- The construction activity is temporary
- Use of heavy equipment and noisy activities is limited to daytime hours
- All feasible noise abatement measures are implemented for noise-producing equipment

**Cal/OSHA.** Occupational exposure to noise is regulated by California Occupational Safety and Health Administration (Cal/OSHA) in Title 8, Group 15, Article 105, Sections 5095 to 5100. This standard stipulates that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce

**TABLE 6.12-8  
APPLICABLE LORS**

LORS	Applicability	Section
<b>Federal</b>		
USEPA 1974 Noise Guidelines	Guidelines for state and local governments.	6.12.4.1
Noise Control Act (1972) as amended by the Quiet Communities Act (1978); (42 USC 4901-4918)	Separate noise-sensitive areas are encouraged.	
<b>State</b>		
CEC	This agency has established guidelines for noise generated during operation and construction of the project. It identifies criteria for the determination of significant impact on residential areas.	6.12.4.2.1
Cal/OSHA Occupational Noise Exposure Regulations (8 CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, § 5095, et seq.)	Sets employee noise exposure limits. Equivalent to Federal OSHA standards.	6.12.4.2.2
<b>Local</b>		
City of Anaheim Municipal Code (Chapter 6.70 – Sound Pressure Levels)	This requirement limits the noise produced for an extended period of time from any premises to 60 dBA at any point on the property line. However, the COA Planning Department has granted a variance for this requirement and has imposed a noise limit of 65 dBA at the property line for the CPP. Temporary construction noise during stated daytime hours is exempt from this noise limit.	6.12.4.3
City of Anaheim General Plan (Noise Element)	This requirement refers to the Municipal Code for limits for stationary noise sources. It requires that construction noise construction equipment operate with mufflers and intake silencers and encourages the use of noise barriers for use within 100-feet of existing residences.	6.12.4.3
City of Placentia Municipal Code (Chapter 23.76 – Noise Control)	This requirement limits the exterior noise at any residential property to 55 dBA during daytime hours and 50 dBA during nighttime hours; 65 dBA at anytime at commercial properties; and 70 dBA at anytime at industrial properties. Temporary construction noise during stated daytime hours is exempt from this noise limit.	6.12.4.3
City of Placentia General Plan (Noise Element)	This requirement is applicable to stationary and temporary construction noise sources such as the proposed project. It requires proposed commercial and industrial uses or operations to be designed so they would not significantly impact noise sensitive areas.	6.12.4.3

sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure to the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

**6.12.2.5.3 Local.** The City of Anaheim Code of Ordinances limits noise levels from on-site noise sources to 60 dBA at any location on the property line for any premise within the city. However, the COA Planning Department has granted a variance for this requirement and has imposed a noise limit of 65 dBA at the property line for the CPP. A letter to this effect from the COA Planning Department is included in Appendix G. The City of Placentia Municipal Code limits outdoor noise levels to noise sensitive areas to 50 dBA during the nighttime hours of 10:00 p.m. to 7:00 a.m. Temporary construction noise is exempt from the noise limits in both Anaheim and Placentia.

#### **6.12.2.6 Involved Agencies and Agency Contacts**

**6.12.2.6.1 Federal.** No agencies were contacted.

**6.12.2.6.2 State.** No agencies were contacted.

**6.12.2.6.3 Local.** The following agency was contacted:

- City of Placentia Planning Department  
401 East Chapman Avenue  
Placentia, CA 92870  
(714) 993-8124  
Permit Clerk Becky Cherene

#### **6.12.3 References**

California Energy Commission. 1997. Rules of Practice and Procedure, Power Plant Site Certification Regulations.

City of Anaheim. 2004a. General Plan. Noise Element. May.

2004b. Code of Ordinances. Chapter 6.70 Sound Pressure Levels. October 26.

City of Placentia. 1974. General Plan. Noise Element. August 6.

2007. Municipal Code. Chapter 23.76 Noise Control. June 19.

Harris, Cyril M. 1979. Handbook of Noise Control, Second Edition.

ISO (International Organization Standardization). 1983. Electric Power Plant Environmental Noise Guide. 2nd Edition, Revised.

1996a. Description and Measurement of Environmental Noise, Basic Quantities and Procedures Part 1, ISO 1996/1.

1996b. Description and Measurement of Environmental Noise, Basic Quantities and Procedures, Acquisition of Data Pertinent to Land Use, Part 2, ISO 1996/2.

1996c. Description and Measurement of Environmental Noise, Basic Quantities and Procedures, Application to Noise Limits, Part 3, ISO 1996/3.

U.S. Environmental Protection Agency (USEPA). 1971. Noise from Construction Equipment and Operations, Building Equipment and Home Appliances. (Prepared under contract by Bolt, et al., Bolt, Beranek & Newman, Boston, MA). Washington, DC.

1974. March. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, EPA Report 55019-74-004. Washington, DC.