5.7 Noise

This section presents an assessment of potential noise effects related to the Huntington Beach Energy Project (HBEP). Section 5.7.1 discusses the fundamentals of acoustics. Section 5.7.2 describes the affected environment, including baseline noise level survey methodology and results. Section 5.7.3 presents an environmental analysis of the construction and operation of the power plant and associated facilities. Section 5.7.4 discusses cumulative effects. Section 5.7.5 discusses mitigation measures. Section 5.7.6 presents applicable laws, ordinances, regulations, and standards (LORS). Section 5.7.7 presents agency contacts, and Section 5.7.8 presents permit requirements and schedules. Section 5.7.9 contains the references used to prepare this section.

5.7.1 Setting

The HBEP site is located in an industrial area of Huntington Beach at 21730 Newland Street, just north of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The project will be located entirely within the existing Huntington Beach Generating Station, an operating power plant. The HBEP site is bounded on the west by a manufactured home/recreational vehicle park, on the north by a tank farm, on the north and east by the Huntington Beach Channel and residential areas, on the southeast by the Huntington Beach Wetland Preserve / Magnolia Marsh wetlands, and to the south and southwest by the Huntington Beach State Park and the Pacific Ocean. The site is located on a gently sloping coastal plain.

HBEP is a 939-megawatt combined-cycle power plant, consisting of two power blocks. Each power block is composed of three combustion turbines with supplemental fired heat recovery steam generators, a steam turbine generator, an air-cooled condenser, and ancillary facilities.. HBEP will reuse existing onsite potable water, natural gas, stormwater, process wastewater, and sanitary pipelines and electrical transmission facilities. No offsite linear developments are proposed as part of the project.

The project will use potable water, provided by the City of Huntington Beach, for construction and operational process and sanitary uses. During operation, stormwater and process wastewater will be discharged to a retention basin and then ultimately to the Pacific Ocean via an existing outfall. Sanitary wastewater will be conveyed to the Orange County Sanitation District via the existing City of Huntington Beach sewer connection. Two 230-kilovolt (kV) transmission interconnections will connect HBEP Power Blocks 1 and 2 to the existing onsite Southern California Edison 230-kV switchyard.

HBEP construction will require the removal of the existing Huntington Beach Generating Station Units 1, 2, and 5. Demolition of Unit 5, scheduled to occur between the fourth quarter of 2014 and the end of 2015, will provide the space for the construction of HBEP Block 1. Construction of Blocks 1 and 2 are each expected to take approximately 42 and 30 months, respectively, with Block 1 construction scheduled to occur from the first quarter of 2015 through the second quarter of 2018, and Block 2 construction scheduled to occur from the first quarter of 2018 through the second quarter of 2020. Removal/demolition of existing Huntington Beach Generating Station Units 1 and 2 is scheduled to occur from the fourth quarter of 2020 through the third quarter of 2022.

Existing Huntington Beach Generating Station Units 3 and 4 were licensed through the California Energy Commission (00-AFC-13C) and demolition of these units is authorized under that license and will proceed irrespective of the HBEP. Therefore, demolition of existing Huntington Beach Generating Station Units 3 and 4 is not part of the HBEP project definition. However, to ensure a comprehensive review of potential project impacts, the demolition of existing Huntington Beach Generating Station Units 3 and 4 is included in the cumulative impact assessment. Removal/demolition of existing Huntington Beach Generating Station Units 3 and 4 will bein advance of the construction of HBEP Block 2.

HBEP construction will require both onsite and offsite laydown and construction parking areas. Approximately 22 acres of construction laydown will be required, with approximately 6 acres at the Huntington Beach Generating Station used for a combination of laydown and construction parking, and 16 acres at the AES Alamitos Generating Station (AGS) used for construction laydown (component storage only/no assembly of components at AGS). During HBEP construction, the large components will be hauled from the construction laydown area at the AGS site to the HBEP site as they are ready for installation.

Construction worker parking for HBEP and the demolition of the existing units at the Huntington Beach Generating Station will be provided by a combination of onsite and offsite parking. A maximum of 330 parking spaces will be required during construction and demolition activities. As shown on Figure 2.3-3 in Section 2.0, Project Description, construction/demolition worker parking will be provided at the following locations:

- Approximately 1.5 acres onsite at the Huntington Beach Generating Station (approximately 130 parking stalls)
- Approximately 3 acres of existing paved/graveled parking located adjacent to HBEP across Newland Street (approximately 300 parking stalls)
- Approximately 2.5 acres of existing paved parking located at the corner of Pacific Coast Highway and Beach Boulevard (approximately 215 parking stalls)
- 225 parking stalls at the City of Huntington Beach shore parking west of the project site.
- Approximately 1.9 acres at the Plains All American Tank Farm located on Magnolia Street (approximately 170 parking stalls)

5.7.2 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 5.7-1.

TABLE 5.7-1
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 typically defined by the L_{eq} level.
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. The background level is generally defined by the L_{90} percentile noise level.
Intrusive	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 noise level as well as the sensitivity of the receiver. The intrusive level is generally defined by the L_{10} percentile noise level.
Sound Pressure (Noise) Level Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
A-Weighted Sound Pressure (Noise) 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. All sound (noise) levels in this report are A-weighted.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level, on an equal energy basis, during the measurement period.
Percentile Noise Level (L_n)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (for example, L_{90})
Day-Night Noise Level (L_{dn} or DNL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels from 10:00 p.m. to 7:00 a.m.

The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighting network measures sound in a similar fashion to the way in which a person perceives or hears sound. There is consensus that A-weighting is appropriate for estimation of the hazard of noise induced hearing loss. With respect to other effects, such as annoyance, A-weighting is acceptable if there is largely middle and high frequency noise present, but if the noise is unusually high at low frequencies, or

contains prominent low frequency tones, the A-weighting may not give a valid measure. Compared with other noise sources, combined cycle power facilities are not typically substantial sources of unusual low frequency noise and are broad band or do not generate strong low frequency tones. Therefore, the A-weighting provides a good measure for evaluating acceptable and unacceptable sound levels for projects such as HBEP.

A-weighted sound levels are typically measured or presented as equivalent noise level (L_{eq}), which is defined as the average noise level, on an equal energy basis for a stated period of time, and is commonly used to measure steady-state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by $L_{xx,}$ where xx represents the percentile of time the sound level is exceeded. The L_{90} is a measurement that represents the noise level that is exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period.

Some metrics used in determining the impact of environmental noise consider the differences in response that people have to daytime and nighttime noise levels. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to nighttime noise levels, the day-night sound level (L_{dn} or DNL) was developed. L_{dn} is a noise index that accounts for the greater annoyance of noise during the nighttime hours.

L_{dn} values are calculated by averaging hourly L_{eq} sound levels for a 24-hour period, and apply a weighting factor to nighttime L_{eq} values. The weighting factor, which reflects the increased sensitivity to noise during nighttime hours, is added to each hourly L_{eq} sound level before the 24-hour L_{dn} is calculated. For the purposes of assessing noise, the 24-hour day is divided into two time periods, with the following weightings:

- Daytime: 7:00 a.m. to 10:00 p.m. (15 hours) weighting factor of 0 decibels (dB)
- Nighttime: 10:00 p.m. to 7:00 a.m. (9 hours) weighting factor of 10 dB

The two time periods are then averaged to compute the overall L_{dn} value. For a continuous noise source, the L_{dn} value is easily computed by adding 6.4 dB to the overall 24-hour noise level (L_{eq}). For example, if the expected continuous noise level from the power plant was 60.0 decibels (A-weighted scale) (dBA), the resulting L_{dn} from the plant would be 66.4 dBA.

The effects of noise on people can be listed in three general categories:

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

In most cases, environmental noise produces effects in the first two categories only. However, workers in industrial plants may experience noise effects in the third category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. 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 to which that person has adapted. 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 the exposed individual.

Table 5.7-2 shows the relative A-weighted noise levels of common sounds measured in the environment and in industry for various sound levels.

TABLE 5.7-2
Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	A-Weighted Noise Level (decibels)	Noise Environments	Subjective Impression
Shotgun (at shooter's ear)	140	Carrier flight deck	Painfully loud
Civil defense siren (at 100 feet)	130		
Jet takeoff (at 200 feet)	120		Threshold of pain
Loud rock music	110	Rock music concert	
Pile driver (at 50 feet)	100		Very loud
Ambulance siren (at 100 feet)	90	Boiler room	
Pneumatic drill (at 50 feet)	80	Noisy restaurant	
Busy traffic; hair dryer	70		Moderately loud
Normal conversation (at 5 feet)	60	Data processing center	
Light traffic (at 100 feet); rainfall	50	Private business office	
Bird calls (distant)	40	Average living room, library	Quiet
Soft whisper (at 5 feet); rustling leaves	30	Quiet bedroom	
	20	Recording studio	
Normal breathing	10		Threshold of hearing

Source: Beranek, 1998.

5.7.3 Affected Environment

5.7.3.1 Local Land Use and Noise Sources

The HBEP site is located in an industrial area of Huntington Beach at 21730 Newland Street, just northeast of the intersection of the Pacific Coast Highway (Highway 1) and Newland Street. The project will be located entirely within the existing Huntington Beach Generating Station.. The HBEP site is designated by the Huntington Beach General Plan as Public (P). The Huntington Beach General Plan states that permitted uses include public utilities. The HBEP property is zoned Public-Semi-Public (PS). Permitted uses in this district include major and minor utilities. Power generating facilities are permitted uses within the PS district subject to a conditional use permit (CUP). While the City's zoning requires a CUP and site approval before a power generating facility can be approved on a property zoned PS, the CEC's licensing process supersedes the County's land use permitting requirements, and therefore a CUP is not required. Nevertheless, HBEP would otherwise comply with these permit approval requirements because the project will be implemented on lands already used for power generation.

Land uses immediately west of the HBEP site consist of a manufactured home and RV park. To the west and south of the project site is Highway 1, beyond which are Huntington State Beach and the Pacific Ocean. Immediately southeast of the project site is the Huntington Beach Wetland Preserve / Magnolia Marsh Restoration Project area. To the east, land uses transition from industrial to low-density residential approximately 0.25 mile from the project site. Immediately north of HBEP on the existing Huntington Beach Generating Station site is the future site of an approved but not constructed seawater desalination facility. Other land uses north of the project site transition from industrial warehouses to low-density residential and recreational approximately 0.25 mile from the project site.

The closest receptor, a manufactured home park, is located approximately 400 feet to the northwest of the closest combustion turbine. Additional residences are located approximately 900 feet to the north and 1,400 feet to the east of the project boundary. The next closest receptors are a daycare facility, located approximately 1,600 feet away, and Edison High School, located approximately 2,650 feet from HBEP. Figure 5.6-1 and Appendix 5.9A show receptors near HBEP.

5.7.3.2 Ambient Noise Survey

To support the analysis of the HBEP, continuous ambient noise monitoring was conducted to determine the level of existing noise in the project area. Long-term (25 hours or more) measurements were collected at four locations (M1 – Gas Metering Station, M2 – Manufactured Home Park, M3 – 22011 Hula Circle, and M4 – 8512 Sandy Hook Drive). Table 5.7-3 and Figure 5.7-1 describe the noise monitoring locations. The detailed monitoring results are presented in Appendix 5.7A.

Larson Davis 831, 824, and 820 ANSI Type 1 (precision) statistical sound level meters were used to conduct the sound level measurements. The sound level meters were field calibrated before and after the survey with a Larson Davis CAL200 calibrator and were factory calibrated within the previous 12 months. Weather conditions during the noise survey were conducive to accurate measurements—generally clear and sunny. The temperature ranged from 64 to 87 degrees Fahrenheit (°F) and the relative humidity varied between 16 and 83 percent.

TABLE 5.7-3
Summary of Noise Survey Locations

Location Number	Location Description	Primary Noise Sources
M1	Gas Metering Station	Piping and Valve Noise
M2	21851 Newland Street, #48 (Manufactured Home Park)	Local and Distance Transportation Sources
M3	22011 Hula Circle	Local and Distance Transportation Sources
M4	8512 Sandy Hook Drive	Local and Distance Transportation Sources

The minimum 4-hour L_{90} noise levels were calculated for each 24-hour period for each location. The averages of these levels for each location are summarized in Table 5.7-4.

TABLE 5.7-4
Average Minimum 4-hour L_{90} Sound Level

Location	Sound Level (dBA)
M1 – Gas Metering Station	61
M2 – 21851 Newland Street, #48	48
M3 – 22011 Hula Circle	38
M4 – 8512 Sandy Hook Drive	36

The hourly measured L_{eq} sound levels were also used to calculate the 24-hour L_{dn} levels at each site on a rolling average basis. The ranges and averages of the L_{dn} levels are summarized in Table 5.7-5.

TABLE 5.7-5
Average and Range of L_{dn} Sound Levels

Location	Average (dBA)	Minimum (dBA)	Maximum (dBA)
M1 – Gas Metering Station	72	69	75
M2 – 21851 Newland Street, #48	58	56	60
M3 – 22011 Hula Circle	56	53	63
M4 – 8512 Sandy Hook Drive	56	44	61

5.7.4 Environmental Analysis

Noise will be produced during the construction (including demolition activities of existing facilities) and operation of the HBEP. Potential noise impacts from HBEP construction and operation activities are assessed in this section.

5.7.4.1 Significance Criteria

Following the California Environmental Quality Act (CEQA) guidelines (California Code of Regulations [CCR], Title 14, Appendix G, Section XI), the HBEP would cause a significant impact if it would result in the following:

- Exposure of people to noise levels in excess of standards established in the local General Plan or noise ordinance
- Exposure of people to excessive ground-borne noise levels or vibration
- Substantial permanent increase in ambient noise levels in the project vicinity
- Substantial temporary or periodic increase in ambient noise levels in the project vicinity

Generally, the HBEP design basis for noise control is the minimum, or the most stringent, noise level required by the applicable LORS. Therefore, noise from the project is evaluated against the City of Huntington Beach's requirements. The City has established quantitative guidelines for determining appropriate noise levels for various land uses in the Noise Element of its General Plan and in its noise ordinance.

For other power plant licensing projects, the CEC staff has stated that an increase in background noise levels up to 5 dBA in a residential setting is insignificant; an increase of more than 10 dBA is generally considered significant. An increase between 5 and 10 dBA may be either significant or insignificant, depending on the particular circumstances of a project.

In addition, the CEC staff has concluded that construction noise is typically insignificant if the construction activity is temporary, use of heavy equipment and noisy activities is limited to daytime hours, and feasible noise abatement measures are implemented for noise-producing equipment.

5.7.4.2 Construction and Demolition Impacts

5.7.4.2.1 Project Construction and Demolition Noise

Construction and demolition activities at the HBEP site are expected to be typical of other power plants in terms of schedule, equipment used, and other types of activities. The noise level will vary during the construction or demolition period, depending on the activities being performed. Construction of power plants can generally be divided into five phases that use different types of construction equipment. The five phases are demolition, site preparation, and excavation; concrete pouring; steel erection; mechanical; and clean-up (Miller et al., 1978). In addition to onsite construction- and demolition-related activities, additional sources of noise include the transport of materials to and from the site or associated laydown areas, as well as construction worker traffic during their commute hours. Vehicles traveling on public roads are regulated by a number of state and local agencies, as described in Section 5.7.7. Section 5.12, Traffic and Transportation, discusses measures to minimize potential traffic impacts, some of these measures (such as the transport of heavy/oversize loads during construction) will result in nighttime traffic on public roads. The project will include best management practices (BMPs) to limit offsite noise impacts, such as ensuring vehicles, are appropriately muffled and noisy activities at offsite construction parking areas (loud stereos or conversations) are limited.

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control and the Empire State Electric Energy Research Company have extensively studied noise from individual pieces of construction equipment, as well as from construction/demolition sites of power plants and other types of facilities (EPA, 1971; Barnes et al., 1976). Because specific information on types, quantities, and operating schedules of construction equipment is not available at this point in the project development, information from these documents for similarly sized industrial projects will be used. Use of these data, which are more than 30 years old, is conservative because the evolution of construction equipment has been toward quieter designs to protect operators from exposure to high noise levels.

0 250 500 1,000 Feet

Legend

- Sound Monitoring Location
- AES Huntington Beach Generating Station
- AES Huntington Beach Energy Project

N

FIGURE 5.7-1
Sound Monitoring Locations
AES Huntington Beach Energy Project
Huntington Beach, California

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The loudest equipment types generally operating at a site during each phase of construction are presented in Table 5.7-6. The composite average or equivalent site noise level, representing noise from all equipment, also is presented for each phase.

TABLE 5.7-6
Construction Equipment and Composite Site Noise Levels

Construction Phase	Loudest Construction Equipment	Equipment Noise Level (dBA) at 50 feet	Composite Site Noise Level (dBA) at 50 feet
Demolition, Site Clearing, and Excavation	Dump Truck	91	89
	Backhoe	85	
Concrete Pouring	Truck	91	78
	Concrete Mixer	85	
Steel Erection	Derrick Crane	88	87
	Jack Hammer	88	
Mechanical	Derrick Crane	88	87
	Pneumatic Tools	86	
Cleanup	Rock Drill	98	89
	Truck	91	

Source: EPA, 1971; Barnes et al., 1976.

Average or equivalent construction/demolition noise levels projected at various distances from the project site are presented in Table 5.7-7. These results are conservative because the only attenuating mechanism considered was divergence of the sound waves in open air. The noisiest construction activities will be confined to the daytime hours. Table 5.7-8 presents noise levels from common construction equipment at various distances.

TABLE 5.7-7
Average Construction Noise Levels at Various Distances

	Noise Level (dBA)		
Construction Phase	At 375 feet	At 1,500 feet	At 3,000 feet
Demolition, Site Clearing, and Excavation	71	59	53
Concrete Pouring	60	48	42
Steel Erection	69	57	51
Mechanical	69	57	51
Clean-Up	71	59	53

TABLE 5.7-8
Noise Levels from Common Construction/Demolition Equipment at Various Distances

Construction Equipment	Typical Noise Level (dBA) at 50 feet	Typical Noise Level (dBA) at 375 feet	Typical Noise Level (dBA) at 1,500 feet
Pile Driver (20,000 to 32,000 ft-lbs/blow)	104	86	74
Dozer (250 to 700 hp)	88	70	58
Front End Loader (6 to 15 yd^3)	88	70	58
Truck (200 to 400 hp)	86	68	56
Grader (13- to 16-foot blade)	85	67	55
Shovels (2 to 5 yd^3)	84	66	54

TABLE 5.7-8
Noise Levels from Common Construction/Demolition Equipment at Various Distances

Construction Equipment	Typical Noise Level (dBA) at 50 feet	Typical Noise Level (dBA) at 375 feet	Typical Noise Level (dBA) at 1,500 feet
Portable Generator (50 to 200 kW)	84	66	54
Derrick Crane (11 to 20 tons)	83	65	53
Mobile Crane (11 to 20 tons)	83	65	53
Concrete Pump (30 to 150 yd^3)	81	63	51
Tractor (3/4 to 2 yd^3)	80	62	50
Unquieted Paving Breaker	80	62	50
Quieted Paving Breaker	73	55	43

yd^3 = cubic yard
ft-lbs/blow = foot pounds per blow
hp = horsepower
kW = kilowatt

Noise generated during the testing and commissioning phase of the project is not expected to be substantially different from that produced during normal full-load operation. Starts and abrupt stops are more frequent during this period, but they are usually short lived. A limited number of construction activities must be conducted on a continuous basis, extending throughout the day and night. Critical concrete pours are an example of one such activity. Others include, but are not limited to, nighttime transportation of heavy construction equipment to the site and the nighttime transport of heavy/oversize loads during construction to minimize traffic impacts, and the subsequent unloading or handling of that equipment on-site or at the laydown facility. Noise emissions from such activities will be limited to the extent feasible.

Steam blows during the construction phase are an activity designed to clean scale and other debris from the boiler tubes and steam lines before admitting any steam to the steam turbine where such debris would damage the blades. When high-pressure blows are used, several short blows several minutes in duration are generally performed each day (during daytime hours) and the entire process generally takes several weeks. Alternatively, quieter, lower-pressure continuous or semi-continuous blows may be used. In either case, steam blow activities are silenced to minimize potential for complaints.

As noted above, construction noise levels vary depending on the nature of the construction activity and its location. To minimize potential construction noise effects, the Applicant is included several noise mitigation measures described in Section 5.7.6. In addition, the Applicant will limit noisy construction or demolition work (that which causes offsite annoyance as evidenced by the filing of a legitimate noise complaint) to Monday through Saturday from 7:00 a.m. to 8:00 p.m. and restricted anytime on Sundays or federal holidays. Haul trucks and other engine-powered equipment will be equipped with adequate mufflers, operated in accordance with posted speed limits, and truck engine exhaust brake use will be limited to emergencies.

5.7.4.2.2 Construction/Demolition Vibration

Construction/demolition vibrations can be divided into three classes, based on the wave form and its source (see Table 5.7-9). It will be limited to normal work hours (during the daytime) and will be of short duration; therefore, no mitigation is required.

TABLE 5.7-9
Construction/Demolition Vibrations

Wave Form	Example Source
Impact	Impact pile driver or blasting
Steady state	Vibratory pile driver
Pseudo steady state	Double acting pile hammer

5.7.4.2.3 Construction/Demolition Worker Exposure to Noise

Worker exposure to noise levels during construction of the HBEP and the demolition of the Huntington Beach Generating Station Units will vary depending on the phase of the project and the proximity of the workers to the noise-generating activities. The project will develop a Hearing Protection Plan that complies with California Division of Occupational Safety and Health Administration (Cal/OSHA) requirements. This Hearing Protection Plan will be incorporated into the project's construction/demolition Health and Safety Plan. The plan will require appropriate hearing protection for workers and visitors throughout the duration of the construction and demolition period. Additional information on the overall construction worker health and safety program is included in Section 5.16, Worker Health and Safety.

5.7.4.3 Operational Impacts

5.7.4.3.1 Worker Exposure

Nearly all equipment and project components 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). Because 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 routinely approach the level allowable under Occupational Safety and Health Act of 1970 guidelines. Nevertheless, signs requiring the use of hearing protection devices will be posted in all areas where noise levels commonly exceed 85 dBA, such as inside acoustical enclosures, and the project will comply with applicable Cal/OSHA requirements. 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. Therefore, noise impacts to workers during operation will be less than significant. Additional information on the overall operational worker health and safety program is included in Section 5.16, Worker Health and Safety.

5.7.4.3.2 Transmission Line and Switchyard Noise Levels

One of the electrical effects of high-voltage transmission lines is corona. Corona is the ionization of the air that occurs at the surface of the energized conductor and suspension hardware due to very high electric field strength at the surface of the metal during certain conditions. Corona may result in radio and television reception interference, audible noise, light, and production of ozone. Corona is generally a principle concern with transmission lines of 345 kV and greater and with lines that are at higher elevations. Corona noise is also generally associated with rain, fog, or foul weather conditions.

There are no offsite linear developments proposed as part of the project. As discussed in Section 3.0, Transmission System Engineering, the design voltage and current flow is not increasing, therefore the audible noise associated with the 230-kV lines and switchyards in the area is not expected to change.

5.7.4.3.3 Plant Operational Noise Levels

A noise model of the proposed HBEP has been developed using the CADNA/A noise model by DataKustik GmbH of Munich, Germany. The CADNA/A noise model is very sophisticated and is capable of modeling very complex industrial plants. The sound propagation factors used in the model have been adopted from International Organization for Standardization (ISO) 9613-2, *Acoustics – Sound Attenuation during Propagation Outdoors* (ISO, 1996). The model divides the proposed facility into a list of individual noise sources representing each piece of equipment that produces a significant amount of noise. Using these noise levels as a basis, the model calculates the noise level that would occur at each receptor from each source after losses from distance, air absorption, blockages, etc., are considered. The sum of all these individual levels is the total plant level at the modeling point. A-weighted sound power (noise) levels used to estimate project noise are summarized in Table 5.7-10.

TABLE 5.7-10
Standard Equipment Sound Power Levels

Source	Sound Power Level (dBA)
Combustion Turbine Generator	125
Heat Recovery Steam Generator	106
Stack Exit	118
Air-Cooled Condenser	119
Steam Turbine Generator (in building)	90
Transformers	90
Boiler Feed Water Pumps	108

The following design measures may be incorporated to ensure the required acoustical performance is realized:

- Noise barriers or improved enclosures around the combustion turbine generator
- Lower-noise combustion turbine generator ventilation
- Acoustical enclosure for the steam turbine generator
- Shrouded or low-noise HRSG
- Lower noise air-cooled condenser (ACC) fans and lagging of the ACC ductwork
- Low-noise and/or noise barriers around transformer
- Acoustical boiler feed pump enclosures
- Lagging of high-noise piping
- Acoustical gas compressor enclosures
- Enhanced stack silencing

The anticipated steady-state sound levels incorporating design features for HBEP at M2, M3, and M4 are 63, 63, and 60 dBA, respectively. At these nearby residential locations, no significant tones are anticipated.

That is not to say that audible tones are impossible—certain sources within the HBEP facility, such as the combustion turbine inlets, transformers, pump motors, and fan gearboxes, have been known to produce significant tones. HBEP will anticipate the potential for audible tones in the final design and specification of the project's equipment and take necessary steps to prevent sources from emitting tones that might be disturbing at the nearest receptors. In addition, the final design of the HBEP facility will ensure the City of Huntington Beach industrial noise standard of 70 dBA at the property line is satisfied.

5.7.4.3.4 Ground and Airborne Vibration

Similar combined-cycle facilities have not resulted in ground or airborne vibration impacts. The project is primarily driven by gas turbines exhausting into a HRSG duct and a stack silencer. These very large ducts reduce low-frequency noise, which is the main source of airborne-induced vibration of structures. It is the Applicant's intention to anticipate the potential for low-frequency noise in the design and specification of the project equipment and take necessary steps to prevent ground or airborne vibration impacts.

The equipment that would be used in the 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. Should an imbalance occur, the event would be detected and the equipment would automatically shut down. Given these protective measures, impacts related to ground and airborne vibrations will be less than significant.

5.7.5 Cumulative Effects

A cumulative impact refers to the HBEP's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code §21083; California Code of Regulation, Title 14, §§15064(h), 15065(c), 15130, and 15355).

The CEQA Guidelines further note that:

> *The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative effects can result from individually minor, but collectively significant, projects taking place over a period of time.*

The HBEP consists of modification to the existing Huntington Beach Generating Station and does not represent a new source of noise on previously unused parcel. The only identified additional source of noise in the project vicinity is the Poseidon Desalination facility, which is proposed on a portion of the Huntington Beach Generating Station. The Environmental Impact Report (EIR) for this facility (City of Huntington Beach, 2010) states that "All stationary equipment shall be designed to insure that noise levels at the Huntington Beach Generating Station property line do not exceed the City's Industrial noise standard of 70.0 dBA and will be subject the approval of the City of Huntington Beach." Given the Poseidon Desalination project has committed to achieving compliance with the City's noise standard, a substantial cumulative noise impact is not anticipated.

Other pending residential, commercial, and industrial projects (see Section 5.6, Land Use) in the area have not been identified as substantial sources of noise in the project vicinity; therefore, cumulative impacts are expected to be less than significant.

5.7.6 Mitigation Measures

HBEP proposes to implement the following measures to minimize any potential noise impacts from project construction and operation.

5.7.6.1 Noise Hot Line

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

5.7.6.2 Noise Complaint Resolution

Throughout the construction, demolition, and operation of the project, the project owner will document, investigate, evaluate, and attempt to resolve all legitimate project-related noise complaints. The Applicant or authorized agent will:

- Use the Noise Complaint Resolution Form typically suggested by the CEC or a 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.

5.7.6.3 Steam Blows

If a traditional, high-pressure steam blow process is used, the project owner shall equip the steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at a distance

of 50 feet. High-pressure steam blows shall be limited to the daytime hours. If the quieter, low-pressure continuous steam blow process is used, the project owner shall prepare a description of the process, with expected noise levels and planned hours of steam blow operation.

5.7.7 Laws, Ordinances, Regulations, and Standards

Table 5.7-11 presents the LORS that apply to noise.

TABLE 5.7-11
Laws, Ordinances, Regulations, and Standards for Noise

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
EPA	Guidelines for state and local governments.	EPA	5.7.7.1.1
Occupational Safety and Health Act of 1970	Exposure of workers over 8-hour shift limited to 90 dBA.	Occupational Safety and Health Administration	5.7.7.1.2
State			
Cal/OSHA, CCR Title 8, Article 105 Sections 095 et seq.	Exposure of workers over 8-hour shift limited to 90 dBA.	Cal/OSHA	5.7.7.2.1
California Vehicle Code Sections 23130 and 23130.5	Regulates vehicle noise limits on California highways.	California Department of Transportation (Caltrans), California Highway Patrol, and the County Sheriff's Office	5.7.7.2.2
Local			
California Government Code Section 65302	Requires local government to prepare plans that contain noise provisions.	California Office of Planning and Research	5.7.7.3
City of Huntington Beach General Plan	Identifies and appraises noise problems within the community and assists the City in making land use decisions.	City of Huntington Beach	5.7.4.3
City of Huntington Beach Municipal Code	The City Code establishes performance standards that noise sources should achieve at existing or planned residential or other noise-sensitive land uses.	City of Huntington Beach	5.7.4.3

5.7.7.1 Federal LORS

5.7.7.1.1 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 guidelines are not applicable.

5.7.7.1.2 Occupational Safety and Health Administration

Onsite noise levels are regulated through the U.S. Occupational Safety and Health Administration (OSHA). The noise exposure level of workers is regulated at 90 dBA, over an 8-hour work shift to protect hearing (29 Code of Federal Regulations [CFR] §1910.95). Onsite noise levels will generally be in the 70-to-85-dBA range. Areas above 85 dBA will be posted as high-noise level areas and hearing protection will be required when entering or working in those areas. The power plant will implement a hearing conservation program for applicable employees and maintain exposure levels below 90 dBA.

5.7.7.2 State LORS

5.7.7.2.1 Cal/OSHA

The California Department of Industrial Relations, Division of Occupational Safety and Health enforces state noise regulations that are the same as the federal OSHA regulations described previously. The Cal/OSHA regulations are contained in the CCR, Title 8, General Industrial Safety Orders, Article 105, Control of Noise Exposure, Sections 5095, et seq.

5.7.7.2.2 California Vehicle Code

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

5.7.7.3 Local LORS

5.7.7.3.1 City of Huntington Beach General Plan

The City of Huntington Beach General Plan Noise Element establishes goals, objectives and policies that address noise issues within the City's jurisdiction. The following identifies the relevant goals, objectives, and policies that pertain to a facility such as HBEP in the City of Huntington Beach:

Goal N1

Ensure that all necessary and appropriate actions are taken to protect Huntington Beach residents, employees, visitors, and noise sensitive uses from the adverse impacts created by excessive noise levels from stationary and ambient sources.

Objective N 1.2

Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise sensitive uses of Huntington Beach.

Policies

N 1.2.1

Require, in areas where noise levels exceed an exterior L_{dn} of 60 dB(A) and an interior L_{dn} of 45 dB(A), that all new development of "noise sensitive" land uses, such as housing, health care facilities, school, libraries and religious facilities, include appropriate buffering and/or construction mitigation measures that will reduce noise exposure to levels within acceptable limits

N 1.2.2

Require new industrial and new commercial land uses or the major expansion of existing land uses to demonstrate that the new or expanded use would not directly responsible for causing ambient noise levels to exceed an exterior L_{dn} of 65 dB(A) on areas containing "noise sensitive" land uses.

N 1.2.3

Require development, in all areas where the ambient noise level exceeds an L_{dn} of 60 dB(A), to conduct an acoustical analysis and incorporate special design measures in their construction, thereby, reducing interior noise levels to the 45 dB(A) L_{dn} level.

Objective N 1.4

Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or "noise-sensitive" uses.

Policies

N 1.4.1

Require that the automobile and truck access of commercial or industrial land uses abutting residential parcels to be located at the maximum practical distance from the nearest residential parcels.

N 1.4.2

Require that the loading and shipping facilities of commercial and industrial land uses abutting residential parcels to be located and designed to minimize the potential noise impact upon residential parcels.

N 1.4.3

Require that the parking areas of all commercial and industrial land uses, which abut residential areas, to be buffered by walls, fences, or adequate landscaping.

N 1.4.4

Require that the parking structures of commercial or industrial land uses be designed to minimize the potential noise impacts of vehicles on the site as well as on adjacent land uses.

N 1.4.5

Require commercial or industrial truck delivery hours to land uses abutting residential uses to be limited unless there is no feasible alternative or there are overriding transportation benefits.

***Objective* N 1.6**

Minimize the impacts of construction noise on adjacent uses.

Policy

N 1.6.1

Ensure that construction acidities be regulated to establish hours of operation, to prevent and/or mitigate the generation of excessive or adverse noise impacts through the implementation of the existing Noise Ordinance and/or any future revisions to the Noise Ordinance.

***Objective* N 1.12**

Ensure any use determined (by the City of Huntington Beach) to be a potential generator of significant stationary noise impacts, be properly analyzed and ensure that the recommended mitigation measures are implemented.

Policies

N 1.12.1

Require detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources. Recommended mitigation measures must be successfully implemented and tested, prior to the issuance of a Certificate of Occupancy for the land use or structure.

N 1.12.2

Encourage major stationary noise generating sources throughout the City of Huntington Beach to install additional noise buffering or reduction mechanisms within their facilities to reduce noise

generation levels to the lowest extent practicable prior to the renewal of Conditional Use Permits or business licenses or prior to the approval and/or issuance of new Conditional Use Permits for said facilities.

5.7.7.3.2 City of Huntington Beach Noise Ordinance

The City of Huntington Beach has adopted a Noise Ordinance (Section 8.40) to address loud noises that may impact residents, businesses and visitors. The specified exterior noise limits for industrial property lines is an L_{50} (median) noise level of 70 dBA.

The Huntington Beach noise ordinance addresses construction noise in their Special Provisions chapter (8.40.090) which states the following activities are exempt: "Noise sources associated with construction, repair, remodeling, or grading of any real property; provided a permit has been obtained from the City; and provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekday, including Saturday, or at any time on Sunday or a federal holiday."

5.7.8 Agencies and Agency Contacts

No agencies were contacted directly to specifically discuss project noise.

TABLE 5.7-12
Agency Contacts for Noise

Issue	Agency	Contact
Noise	City of Huntington Beach, Planning Division	Jane James, Senior Planner 2000 Main Street 3rd Floor Huntington Beach, CA 92648 714-536-5596 jjames@surfcity-hb.org

5.7.9 Permits and Permit Schedule

No noise permits are required; therefore, there is no permit schedule.

5.7.10 References

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