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3.9 NOISE

This section presents an assessment of potential noise effects related to construction and operation of the Proposed Project and alternatives. This assessment addresses the potential effects on sensitive receptors of increases in noise above ambient levels.

3.9.1 AFFECTED ENVIRONMENT

This section discusses the existing noise environment within the areas containing facilities associated with the Proposed Project and alternatives. This section also examines federal, state and local regulations applicable to noise generated during construction and operation of the Proposed Project and alternatives.

3.9.1.1 Environmental Setting

3.9.1.1.1 General Characteristics of Noise

Discussions of environmental noise do not focus on pure tones. Commonly heard sounds have complex frequency and pressure characteristics. Accordingly, sound measurement equipment has been designed to account for the sensitivity of human hearing to different frequencies. The scale used for noise analyses is the decibel (dB). Corrective factors have been developed experimentally for various frequencies to adjust actual sound pressure levels to correspond to human hearing. For measuring noise in ordinary environments, "A-weighted" correction factors are employed. The filter de-emphasizes the very low and very high frequencies of sound in a manner similar to the response of the human ear. Therefore, the A-weighted decibel (dBA) is a good correlation to a human's subjective reaction to noise. The dBA scale is used in most ordinances and standards.

The equivalent sound pressure level (L_{eq}) is defined as the average noise level, on an energy basis, for a stated period of time (e.g., hourly). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighted curve. The sound level meter also performs the calculations required to determine the L_{eq} for the measurement period.

Table 3.9-1 lists noise levels for common sources to provide a context for the noise levels discussed in the remainder of this section. During the nighttime, exterior background noises are generally lower than the daytime levels. Most household noise also decreases at night and exterior noise becomes more noticeable. Further, most people sleep at night and are more sensitive to noise intrusion during evening and nighttime hours. To account for human sensitivity to noise levels at differing times of day, the Community Noise Equivalent Level (CNEL) was developed. CNEL is a noise index that accounts for the greater annoyance of noise during the evening and nighttime hours. CNEL values are calculated by averaging hourly L_{eq} sound levels for a 24-hour period, and apply a weighting factor to evening and nighttime L_{eq} values.

Table 3.9-1
Typical Sound Levels for Select Noise Sources

Type Of Activity	Sound Level In Decibels (dB)	Subjective Impression
Civil Defense Siren (100 feet)	140	
	130	Pain Threshold
Jet Takeoff (200 feet)	120	
Loud Automobile Horn (3 feet)	115	
Jet Takeoff (2,000 feet)	105	
Pile Driver (50 feet)	100	Very Loud
Freight Cars (50 feet)	95	
Heavy Truck (50 feet) Ambulance Siren (100 feet)	90	
Riding Inside a City Bus	83	
Pneumatic Drill (50 feet) Alarm Clock (2 feet)	80	
Average Traffic on Street Corner	75	
Freeway (100 feet)	70	Moderately Loud
Vacuum Cleaner (10 Feet)	69	
Conversational Speech Department/Large Retail Store	60	
Light Auto Traffic (100 feet)	50	
Large Transformer (200 feet)	40	Quiet
Library	35	
Soft Whispering (5 feet)	30	
	20	
	10	Hearing Threshold

The weighting factor, which reflects increased sensitivity to noise during evening and nighttime hours, is added to each hourly L_{eq} sound level before the 24-hour CNEL is calculated. For the purposes of assessing noise, the 24-hour day is divided into three time periods with the following weighting:

Daytime	7 a.m. to 7 p.m.	Weighting Factor of 0 dB
Evening	7 p.m. to 10 p.m.	Weighting Factor of 5 dB
Nighttime	10 p.m. to 7 a.m.	Weighting Factor of 10 dB

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

(1) Subjective effects of annoyance, nuisance, and dissatisfaction;

(2) Interference with activities such as conversation, sleep, and learning; and

(3) 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 last category. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. The inability to define noise

subjectively is primarily because of the wide variation in individual thresholds of annoyance and perception 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 a new noise exceeds the existing ambient noise level, the less acceptable the new noise would be to the listeners.

Increases in dBA noise level can be described in the following ways:

- Except in carefully controlled laboratory experiments, a change of one dBA cannot be perceived by humans;
- Outside the laboratory, a three dBA change is considered a just-perceivable difference;
- A change in level of at least five dBA is required before any noticeable change in community response would be expected; and
- A ten dBA change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse community response.

3.9.1.1.2 Existing Noise Environment

The following section discusses the current noise environment in areas within and adjacent to facilities that would be associated with the Proposed Project and alternatives.

The Proposed Project and alternatives are located primarily in areas that have few permanent residents and few activities that generate substantial sustained noise events. Activities and locations within the Proposed Project and alternatives that generate noise levels above background include those listed below. In addition to the activities listed below, background noise within the Proposed Project and alternatives includes that from natural sources such as wind and wildlife.

- Traffic on major road systems (e.g., I-10, SR-78, SR-111) and secondary or feeder roadways near or across the Proposed Project and alternatives transmission line routes.
- OHV activities at various locations along the Proposed Project and alternative transmission line right-of-ways.
- Rural and suburban residential areas, such as North Palm Springs and Thousand Palms.
- Isolated residential areas, communities, and camping areas along portions of the Proposed Project and alternative transmission line right-of-ways.
- Agricultural activities near the Proposed Project and alternative transmission line right-of-ways.
- "Humming" and other sounds associated with existing transmission line and substation operation, and vehicle and equipment use associated with operation and maintenance activities of electrical facilities.

3.9.1.1.2.1 Traffic Noise from Area Roadways - The transmission line associated with the Proposed Project and alternatives would cross I-10 just south of the proposed Keim Substation/Switching Station, which is just south of the Blythe Energy Project. The Proposed Project and Alternatives A and C would run near or parallel to portions of I-10 for much of their routes. As discussed in Section 2, the Proposed Project and Alternative A transmission line alignments would also cross I-10 twice, and the Alternative C transmission line alignment would cross I-10 four times.

Alternative B would parallel SR-78 and the SPRR line for much of its route. Traffic along these primary transportation routes consists of both truck and passenger vehicles (and rail traffic along the SPRR). Alternative B would be located along the western side of SR-78 for approximately 7 miles and would cross SR-78 twice. Alternative B Option B-1 would be adjacent to SR-78 for an additional 5 miles and would have four additional crossings.

I-10 is a major transportation artery and can have significant localized noise levels, especially from large diesel long-haul trucks. During peak use periods, traffic noise levels can range from 80 to 90 dBA at 50 feet from the shoulder of the interstate. SR-78 and SR-111 experience lower traffic volumes and vehicle speeds; therefore, likely have somewhat lower associated noise levels.

Limited local roadways exist in areas near the Proposed Project and alternative routes. With the exception of primary roadways and a limited number of paved secondary roads, most of the roads in the area are compacted earth or gravel with low traffic volumes. Typical vehicle use along these roads consists of local residents and farmers, delivery trucks and other vendors, and recreationists. Noise levels along these roadways when vehicles are present are expected to range from 50 to 70 dBA at 50 feet from the shoulder of the road.

3.9.1.1.2.2 Off–Highway Vehicles - Many portions of the Proposed Project and alternative transmission line routes would be located in areas with very limited or no development. These areas attract many recreational visitors, especially on weekends. Many visitors use these areas for off-road recreation activities. As a result, noise generated from OHV use can occur along portions of the routes. OHV noise is isolated and localized. Noise levels of these vehicles can vary from 50 to over 80 dBA at a distance of 25 feet, depending upon the activity (e.g., idling, rapid acceleration, etc.) and type of vehicle.

3.9.1.1.2.3 Residential and Camping Areas - Isolated residences, predominately farmhouses, are located within the Proposed Project and alternative area. Additional residences are located within or near small communities within several miles of the Proposed Project and each of the alternative routes. Additionally, small communities are located near the Midway Substation, Devers Substation, and the proposed Keim Substation/Switching Station. Some areas along the routes also contain developed and undeveloped camping areas. The general noise environment of areas within and adjacent to residences and camping areas are likely to be typical of rural to suburban locations, normally averaging from 30 to 50 dBA. Outdoor average nighttime noise levels are typically approximately five dBA quieter than daytime averages. However, they can vary widely, depending upon the character of the area and environment.

3.9.1.1.2.4 Agricultural Activities - Agricultural activities are conducted on land along portions of the Proposed Project transmission line route and along portions of each of the alternative routes. Noise associated with farming activities includes that generated by heavy equipment used for cultivation and harvesting. Maximum noise levels associated with farm equipment typically range from 75 to 85 dBA at a distance of 50 feet.

3.9.1.1.2.5 Transmission Facilities - Operation of high voltage transmission lines and electric substation equipment, which exist within the Proposed Project area and along much of the alternative transmission line routes, can create audible noise. Transmission lines can generate a small amount of sound energy during corona activity. Corona activity is a luminous discharge due to ionization of the air surrounding an electrode (electrodes may be conductors, hardware, accessories, or insulators) caused by a voltage gradient exceeding a certain critical value. This audible noise from the line can barely be heard in fair weather conditions on higher voltage lines. During wet weather conditions, water drops that collect on conductors can increase corona activity so that a crackling or humming sound may be heard near the line. This noise is caused by small electrical discharges from the water drops. Audible noise decreases with distance away from the transmission line.

For substations, electrical transformers and their associated transmission lines are generally the main source of audible noise. Public concerns can develop concerning audible noise from electrical facilities in proximity to residences.

3.9.1.1.3 Sensitive Receptors

Noise analysis customarily focuses on "sensitive receptors" (i.e., noise-sensitive land uses such as residences, hotels, churches, auditoriums, schools, libraries, hospitals, and parks). Sensitive receptors within the Proposed Project area and alternative transmission line routes are limited, and consist primarily of residents and seasonal campers dispersed throughout the area. Specific sensitive receptors that could be affected are identified in the impacts discussion in section 3.9.2, Environmental Consequences.

3.9.1.2 Regulatory Setting

The following sections discuss regulations and noise standards applicable to the Proposed Project and alternatives.

3.9.1.2.1 Federal

Federal codes, primarily the Occupational Safety and Health Act of 1970 (OSHA), exist that address worker exposure noise levels. These regulations would be applicable during construction and maintenance of the Proposed Project and alternatives. These codes limit worker exposure to noise levels of 85 dB or lower over an 8-hour period.

The U.S. EPA (U.S. EPA 1974) has established general guidelines for noise levels in sensitive areas. These general guidelines have been established to give state and/or local governments guidance in establishing local laws, ordinances, rules, or standards. The U.S. EPA guidelines suggest that the average residential outdoor noise level be 55 dB, and the indoor level be 45 dB. The indoor level also applies to hospitals, schools, and libraries.

3.9.1.2.2 State

As with federal standards, State of California regulations (California Noise Exposure Regulations and Title 8, CCR, Section 5095) address worker exposure noise levels. These regulations limit worker exposure to noise levels of 85 dB or lower over an 8-hour period. The State of California has not established noise levels for various non-work-related environments.

3.9.1.2.3 Local

County and other local governments have established general guidelines for noise levels. Generally, these guidelines are set to reduce nuisance noise levels and do not reflect human health concerns. Nuisance levels for most areas are outside sources that exceed 65 dB in residential communities. Riverside and Imperial Counties have established this level in their General Plans for residential areas at sites during facility operation.

3.9.2 ENVIRONMENTAL CONSEQUENCES

3.9.2.1 Methodology and Significance Criteria

The assessment of potential noise impacts considers the introduction of anticipated noise levels generated during project construction and operation to ambient noise levels in areas where sensitive receptors exist.

The Proposed Project and alternatives would have a significant effect on the environment if noise generated during construction or operation would:

- Result in a significant increase in noise levels to sensitive receptors in the area; or
- Conflict with applicable noise restrictions or standards imposed by regulatory agencies.

3.9.2.2 Proposed Project Impacts and Mitigation Measures

This section identifies the potentially significant adverse impacts and required mitigation measures for the Proposed Project. In addition, as described in Sections 1 and 2, in response to comments received on the Draft EIS/EIR, a minor variation to the Proposed Project was developed (referred to as Variation PP1). Variation PP1 would remain in the same general alignment as the Proposed Project but would be shifted south approximately 150 feet into SCE's existing and approved PVD2 right-of-way. Therefore, unless noted below, the noise impacts of Variation PP1 would be similar to those identified for the Proposed Project.

Noise Impact 1: *Noise generated during construction of project facilities could result in temporary increases in noise levels to sensitive receptors.*

Noise levels generated during construction would vary and depend upon the construction phase. Construction of a transmission line can be divided into the following phases: (1) site preparation and excavation, (2) foundation and concrete pouring, (3) pole erection, (4) wire pulling and installation, and (5) cleanup.

During the construction period, a variety of heavy equipment would be utilized along the proposed right-of-way. Noise levels produced by selected construction equipment at various distances are given in Table 3.9-2. It should be noted that the noise levels given in Table 3.9-2 are based on 1974 data. Newer construction equipment has been developed with lower noise levels. Therefore, the noise levels given in Table 3.9-2 should be considered the maximum potential noise levels. Overall noise levels associated with general construction activities are provided in Table 3.9-3.

Table 3.9-2
Sound Pressure Levels for Selected Construction Equipment

Equipment	Typical Sound Levels at 50 feet (dB)
Dump Truck	88
Portable Air Compressor	81
Scraper	88
Dozer	87
Paver	89
Concrete Mixer (truck)	85
Generator	76
Pneumatic Tools	85
Rock Drill	98
Pump	76
Backhoe	85

Source: U.S. EPA 1974.

Table 3.9-3
Sound Pressure Levels by Construction Activity

Activity	Loudest Construction Equipment	Equipment Noise Level at 50 Feet (dB)	Composite Site Noise Level at 50 Feet (dB)
Site Preparation and Excavation	Dump Truck Backhoe	91 85	89
Foundation and Concrete Pouring	Heavy Truck Concrete Mixer	91 85	78
Pole Erection	Derrick Crane Jack Hammer	88 88	87
Wire Pulling and Installation	Derrick Crane Heavy Truck	88 86	87
Cleanup	Heavy Truck Grader	91 87	89

Source: U.S. EPA December 1971.

To calculate the noise level at a given distance from a noise source, the noise levels are mathematically calculated using the Inverse Square Law of Noise Propagation. Briefly, this formulation states that noise decreases by approximately six dBA with every doubling of the distance from the source. This methodology is represented by the following formula:

$L_2 = L_1 - 20 \log (R_2/R_1)$

Where:

L_1 = Noise level measured at a distance R_1 from the source.
L_2 = Noise level at a selected distance R_2 from the source.

Table 3.9-4 is provided to demonstrate how noise would decrease with distance. The highest noise level given in Table 3.9-4 of 91 dB was used as the measured or L_1 noise level at a distance of 50 feet (R_1).

Table 3.9-4
Noise Level Decreases with Distance for Construction

Distance (feet)	Noise Level (dB)
50	91
100	85
500	71
1,000	65
2,500	57
5,000	51

The route of the Proposed Project would come within close proximity of isolated residences along or near I-10 and the following residential communities:

- Nicholls Warm Springs/Palo Verdi (3,000 feet)
- Desert Center (1,000 feet)
- Chiraco Summit (4,000 feet)
- Thousand Palms (2,000 feet)

Noise impacts to residents in the area would depend upon distance from the construction activities. Noise levels for the residential communities named above would be masked to some extent by I-10. Noise levels associated with construction of the transmission line for these communities would range from approximately 65 dB to less than 49 dB. Given the right-of-way distance of 300 feet, noise levels received by isolated residents would be about 75 dB.

The Proposed Project would pass through North Palm Springs. Therefore, noise levels could be as high as 91 dB, similar to the noise of heavy truck traffic on a freeway.

The above noise impact is considered to be less than significant, because construction activities would be temporary and of short duration. The following mitigation, however, is proposed to further reduce potential impacts.

Noise Impact 1 Mitigation:

a) Construction occurring within 0.5 miles of a residential dwelling or designated campground shall be limited to a Monday through Friday work schedule of 7:00 a.m. to 7:00 p.m. to reduce sleep interference.

b) Construction equipment shall be equipped with manufacturer recommended mufflers or equivalent.

c) Construction equipment shall be turned off when not in operation.

Noise Impact 2: *Blasting that may be necessary during transmission line construction could create a nuisance at sensitive receptors within proximity to such activities.*

Although blasting is not anticipated for the Proposed Project it may be required in isolated instances for construction of tower foundations. Unlike construction equipment that tends to be fairly steady, blasts create a peak, short-lived noise. These blasts are perceived by a human receptor as a "boom" and are startling and a nuisance. These booms normally last less than 0.5 seconds.

Blast noise sources are normally measured on the C-weighted scale (dBC), because this scale is more representative of human perception of low frequency sound associated with loud noises such as blasting. Maximum noise levels resulting from blasting would be less than 120 dBC. Such noise levels could create adverse reactions for nearby sensitive receptors.

Blasting can create local ground vibrations. The character of the blast and ground vibrations is dependent on various factors such as the type of soil/rock, type of explosive, amount of explosive used, depth of explosion, and meteorological conditions. Under most conditions, ground vibrations would not effect or damage property outside of the 300-foot right-of-way.

The mountain areas are the most likely location where blasting would occur. Few residential or other human sensitive areas are located in these areas. Blasting has a low probability of occurring, especially near or adjacent to sensitive receptors. If it does occur, it would be of short duration, and, therefore, would be less than significant. The following mitigation is proposed to reduce any potential noise impacts that could result if blasting was required for construction of the Proposed Project transmission tower footings.

Noise Impact 2 Mitigation:

a) Blasting during construction would only be conducted when other practicable excavation methods are not available.

b) In the event that blasting is necessary, it would be conducted only during the hours of 7:00 a.m. to 5:00 p.m., Monday through Friday.

c) Sensitive receptors within areas in which noise from blasting would be greater than ten dB would be provided advance notification of the date and time of any blasting activities.

d) In the event that blasting is necessary, a Blasting Plan would be developed and approved by the BLM and the project proponents.

Noise Impact 3: *Operational noise would include noise emitted by project facilities, such as humming and hissing, and noise from activities associated with maintenance. These noise levels would be low and of short duration in the case of operational noise and noise resulting from maintenance activities. These activities are not expected to adversely affect sensitive receptors.*

Section 3.9.1.1.2.5 discussed audible noise that can be generated by electric transmission lines. Similar noises would also be generated at the Proposed Project'ssubstation facilities. However, these noise levels would be below regulatory limits and the standards of significance applicable to this analysis. Such noise is estimated at approximately 44 dBA directly under a transmission line during inclement weather and about 20 dB during fair weather. These noise levels are very low and would not likely be audible to sensitive receptors away from the right-of-way. Therefore, this impact is considered less than significant.

Other operational noise impacts associated with the Proposed Project transmission line would be motor vehicle traffic along the right-of-way during inspection and maintenance of the line. Noise generated during these activities would be of short duration and consistent with other noise sources in the area and is, therefore, considered to be less than significant.

No mitigation is proposed for Noise Impact 3.

3.9.2.3 Alternative A Impacts and Mitigation

Impacts associated with Alternative A would be similar to those discussed above for the Proposed Project. Corresponding mitigation measures are expected to be sufficient to reduce potentially significant impacts to a less than significant level.

3.9.2.4 Alternative B Impacts and Mitigation

The closest significant residential community along the Alternative B route is Nicholls Hot Spring/Palo Verdi (5,000 feet). Noise levels at Nicholls Hot Springs/Palo Verdi would be approximately 51 dBA. This alternative goes through Glamis, but Glamis is composed of very few residents. Noise levels for Glamis could be as high as 91 dBA.

The Alternative B route is within close proximity (approximately .25 miles) of a store and campground near the Sand Hills Recreation Area. These sensitive receptors are limited to seasonal and long-term occupants at the campground. Noise from construction activities would be about 57 dBA which could be heard by campers, especially during nighttime.

Noise impacts to residents in the area would depend upon distance from the construction activities. However, because construction activities would be of short duration, this impact is considered to be less than significant. Construction, potential blasting and operational noise could have impacts similar to those identified for the Proposed Project. These impacts would be less than significant and could be further reduced through implementation of the mitigation measures identified for the Proposed Project.

3.9.2.5 Alternative C Impacts and Mitigation

Impacts associated with Alternative C would be similar to those discussed above for the Proposed Project. Corresponding mitigation measures are expected to be sufficient to reduce potentially significant impacts to a less than significant level.

3.9.2.6 No Project Alternative

Under the No Project Alternative, no facilities would be constructed, noise would not be generated, and no noise impacts would occur.