Section 4.11

THIS PAGE IS INTENTIONALLY BLANK

4.11 NOISE

This section assesses the potential noise and vibration impacts associated with the construction and operation of the Proposed Project. It includes an evaluation of the potential effects on noise-sensitive receptors in the project site vicinity. A 25-hour noise survey was conducted to establish background noise levels.

4.11.1 General Noise Characteristics

The unit of sound measurement is the decibel (dB). The dB scale is a logarithmic measure used to quantify the magnitude of the sound pressure with respect to a standard reference value. In air, that reference pressure is 20 micropascals (μPa).

4.11.1.1 Human Response to Sound

The human ear is not uniformly sensitive to all sound frequencies. Therefore, the A-weighting scale has been devised to correspond with the human ear's sensitivity. The A-weighting scale uses the specific weighting of sound pressure levels from about 31.5 hertz (Hz) to 16 kilohertz (kHz) for determining the human response to sound. The resulting unit of measure is the A-weighted decibel (dBA).

The sound levels in most communities fluctuate depending upon the activity of nearby and distant noise sources, time of the day, or season of the year. Within an hour, the sound level will fluctuate between the lowest level (Lmin) and the highest level (Lmax). Because sound levels can vary over a given time period, they are often quantified further using the Equivalent Sound Level (Leq) and Day-Night Sound Level (Ldn). The Leq is an average of the time-varying sound energy for a specified time period. The Ldn is an average of the time-varying sound energy for one 24-hour period, with a 10 dB addition to the sound energy for the time period between 22:00 and 07:00 hours. In California, the Community Noise Equivalent Level (CNEL) is often cited. CNEL is similar to Ldn, except the period between 20:00 and 22:00 hours has a 5 dB addition. Ldn and CNEL are normally within 0.5 dB of each other.

4.11.1.2 Sound Propagation

In air, sound from a point source radiates according to inverse square laws either spherically or hemispherically from the source, depending upon whether the noise source is near a reflecting surface, such as the ground. Consequently, sound will decrease at a rate of 6 dB per doubling of the distance from a point source. Additional decreases will occur due to sound absorption in the air, interaction with the ground, and shielding by intervening obstacles.

4.11.1.3 Vibration

Vibration from objects in contact with the ground will propagate energy through the ground and can be perceptible by humans and animals in the form of perceptible movement or in the form of rumbling sound caused by the vibration of room surfaces. The latter is described as ground-borne noise.

The potential for architectural or structural damage from ground vibration is measured as peak particle velocity (PPV). As shown in Table 4.11-1: Guideline Vibration Damage Potential Threshold Criteria, Caltrans recommends a PPV of 0.1 inches/second as the general threshold for the occurrence of minor damage to fragile buildings: however, residential structures are more resilient, and the damage threshold is at least a PPV of 0.3 inches/second (Jones & Stokes 2004).

TABLE 4.11-1
GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure and Condition	Maximum PPV (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.10
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.30
New residential structures	1.0	0.50
Modern industrial/commercial buildings	2.0	0.50
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Caltrans has a synthesis of criteria relating to human perception, as summarized in Table 4.11-2: Guideline Vibration Annoyance Potential Criteria. Some individuals may be annoyed at barely perceptible levels of vibration, depending on the activities in which they are participating.

TABLE 4.11-2
GUIDELINE VIBRATION ANNOYANCE POTENTIAL CRITERIA

Human Response	Maximum PPV (inches/second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.40
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

4.11.2 Applicable Laws, Regulations, and Standards

The Proposed Project would comply with construction schedules contained within local noise ordinances. If construction is extended beyond the allowed schedule, SCE would obtain the applicable variance. Federal, state, and local laws and regulations relating to noise issues are discussed below.

4.11.2.1 Federal and State

The Occupational Health and Safety Act of 1970 (OSHA) (29 Code of Federal Regulations [CFR] 1910.95) is implemented by Cal OSHA. OSHA regulates the worker noise exposure to 90 dBA over an 8-hour work shift. Areas above 85 dBA need to be posted as high-noise-level areas, and hearing protection will be required.

4.11.2.2 County of Riverside

The noise ordinance for Riverside County prohibits construction within 0.25 mile of an occupied residence unless it occurs between the hours of 6:00 a.m. and 6:00 p.m. (June through September) or between the hours of 7:00 a.m. and 6:00 p.m. (October through May). Exceptions to these standards are only allowed with the written consent of the building official (Ordinance No. 725, Chapter 1.16, of the Riverside County Code).

4.11.2.3 Riverside County Integrated Project – Chapter 7: Noise Element

The Riverside County Noise Element sets Leq restrictions for residential land-use zone and time-of-day for stationary sources as shown in the table below. Construction noise limits are not provided. Construction noise impacts are to be reduced by limiting the hours of construction, the development of a construction noise mitigation plan, and the use of noise-reduction features (Table 4.11-3: Riverside County Integrated Project Noise Restrictions).

TABLE 4.11-3
RIVERSIDE COUNTY INTEGRATED PROJECT NOISE RESTRICTIONS

Designated Noise Land Use Zone	Time Interval	Exterior Noise [1] (dBA)
Residential (daytime)	7 a.m. to 10 p.m.	65
(nighttime)	10 p.m. to 7 a.m.	45

1. Where the measured existing ambient noise exceeds the limits, the maximum allowable noise level is increased to reflect the measured ambient noise level. Excludes construction activities.

4.11.2.4 City of Palm Springs

The City of Palm Springs Municipal Ordinance, Chapter 11.74, sets dBA restrictions according to land-use zone and time-of-day for stationary sources shown in the table below. Construction noise limits are not provided, and hours of construction are limited to between 7 a.m. and 7 p.m. on weekdays and between 8 a.m. and 5 p.m. on Saturdays.

The City of Palm Springs Noise Element establishes land-use compatibility guidelines for residential developments. Residential development is not allowed without a noise study to determine noise insulation requirements where exterior noise levels exceed CNEL 65 (Table 4.11-4: City of Palm Springs Noise Restrictions).

TABLE 4.11-4 CITY OF PALM SPRINGS NOISE RESTRICTIONS		
Designated Noise Land Use Zone	**Time Interval**	**Exterior Noise [1] Leq (dBA)**
Low-Density Residential	7 a.m. to 6 p.m. 6 p.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45 40
High-Density Residential	7 a.m. to 6 p.m. 6 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
Commercial	7 a.m. to 6 p.m. 6 p.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 50
Industrial	7 a.m. to 6 p.m. 6 p.m. to 10 p.m. 10 p.m. to 7 a.m.	70 60 55
1. Construction noise limits are not provided. Hours of construction are limited to between 7 a.m. and 7 p.m. on weekdays and between 8 a.m. and 5 p.m. on Saturdays.		

4.11.2.5 Palm Desert

The City of Palm Desert Noise Element has jurisdiction over the community of Thousand Palms. The element establishes land use compatibility guidelines for residential developments. Residential development is not allowed without a noise study to determine noise insulation requirements where exterior noise levels exceed CNEL 65.

The Palm Desert Noise Ordinance, Chapter 9.24, Noise Control, sets 1-hour average noise level limits as indicated in the Table 4.11-5: City of Palm Desert Noise Restrictions.

TABLE 4.11-5 CITY OF PALM DESERT NOISE RESTRICTIONS		
Designated Noise Land Use Zone	**Time Interval**	**Exterior Noise [1] Leq (dBA)**
Residential	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 45
Commercial	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	65 55
Manufacturing Industrial Agricultural Zone	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	70 55
1. Where the measured existing ambient noise exceeds the limits, the maximum allowable noise level is increased to reflect the measured ambient noise level. Construction, operation, maintenance, and repairs of equipment, apparatus, or facilities of public utilities subject to the regulatory jurisdiction of the California Public Utilities District are exempt from noise limits.		

4.11.2.6 Cathedral City

The Cathedral City Municipal Code, Chapter 11.96, Noise Control, does not set specific noise level limits but establishes Prohibited Acts, including:

7. Making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary or unusual noise that disturbs the comfort, repose, health, peace and quiet or which causes discomfort or annoyance to any reasonable person of normal sensitivity.

Section 11.96.060, Exemptions, lists activities and noise sources that are exempt from the provisions of the noise ordinance, including:

K. Construction, operation, maintenance and repairs of equipment, apparatus or facilities of public utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.

4.11.3 Significance Criteria

Impacts to noise levels are considered potentially significant if the 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
- a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project
- a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project
- for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public-use airport, exposure for people residing or working in the project area to excessive noise levels
- for a project within the vicinity of a private airstrip, exposure for people residing or working in the project area to excessive noise levels

4.11.4 Applicant Proposed Measures

The following APMs would be implemented to reduce construction noise.

NOISE-1. Noise Ordinances. SCE would comply with all applicable noise ordinances construction schedule. In the event the construction must occur outside the allowable work hours, a variance would be obtained.

NOISE-2. **Noise Control Equipment Maintenance.** Maintain all noise-control equipment in good working order, in accordance with manufacturers' specifications.

NOISE-3. Handling of Noise Complaints. During construction, investigate, document, evaluate, and attempt to resolve legitimate project-related noise complaints. This would involve attempting to contact the source (person or persons) of the noise complaint within 24

hours; investigating to determine the project noise source(s) that led to the complaint; and taking all feasible measures to reduce the noise at the source, if the complaint is legitimate.

4.11.5 Environmental Setting

Ambient noise measurements were made at two locations, shown in Figure 4.11-1: Noise Measurement Location 1 and Figure 4.11-2: Noise Measurement Location 2, and recorded in Table 4.11-6: Ambient Noise Measurements - May 11, 2006 to May 12, 2006, in order to describe the existing noise environment in the vicinity of the Proposed Project. Measurement Location 1 was located just south of the Mirage Substation, and Measurement Location 2 was located at the nearest residential area, northwest of Farrell Substation.

The minimum nighttime Leq was 47 dBA near the Mirage Substation and 44 dBA near the Farrell Substation. During normal construction hours (7 a.m. to 7 p.m.), daytime Leq varied between 50 dBA and 57 dBA at the measurement location near Mirage Substation and between 52 dBA and 59 dBA at the measurement location near Farrell Substation. The measurements show that the area is typically quiet. Both locations are outside the 60 CNEL contour for Palm Springs International Airport, shown in Figure 4.11-3: Palm Springs International Airport CNEL Noise Contours. Local noise levels are more associated with proximity to roadways and noise sources from the nearby community, such as air conditioners.

4.11.5.1 Transmission

Proposed Devers-Coachella Valley 220 kV Loop-In

The Proposed Devers-Coachella Valley 220 kV Loop-In would be located within unincorporated Riverside County, near the community of Thousand Palms, and within SCE ROWs and franchise locations. The area is mostly undeveloped. Via Las Palma is approximately 690 feet west of the SCE ROW, and there are mixed-use lots on both sides of Via Las Palma. The residential structures are at least 250 feet from the SCE ROW. The existing noise environment along the Proposed Devers-Coachella Valley 220 kV Loop-In includes contributions from the following sources:

- local street traffic on Via Las Palma
- occasional aircraft over-flights from the Palm Springs International Airport
- commercial activities
- I-10 traffic
- UPRR activity
- existing substation
- natural sounds of the wind and birds

Based upon the ambient noise measurements described above, the CNEL along this transmission line would be approximately 58 dBA.

TABLE 4.11-6
AMBIENT NOISE MEASUREMENTS – MAY 11, 2006 TO MAY 12, 2006

	Location 1: Near Mirage Substation				Location 2: Near Farrell Substation			
Hour	**Leq**	**L(10)**	**L(50)**	**L(90)**	**Leq**	**L(10)**	**L(50)**	**L(90)**
14:00	51.2	54.7	47.7	40.1	55.8	55.6	46.7	43.5
15:00	57.6	56.9	49.7	42.0	51.0	52.0	46.5	43.5
16:00	55.2	58.1	53.4	47.5	52.4	54.3	50.6	47.2
17:00	56.1	59.1	53.9	47.6	58.7	57.9	54.9	52.3
18:00	54.0	57.8	51.2	43.0	53.3	55.5	52.2	48.9
19:00	53.6	56.9	51.4	44.4	52.0	53.7	50.8	47.4
20:00	51.4	54.4	49.2	45.1	50.6	53.0	49.4	45.5
21:00	52.6	55.2	50.5	47.7	50.3	52.4	48.7	45.4
22:00	51.4	54.6	50.1	46.7	48.8	51.5	47.6	44.2
23:00	50.3	52.9	48.8	46.6	48.1	51.2	46.0	41.8
0:00	47.7	48.9	45.3	42.7	47.4	49.9	43.6	38.8
1:00	48.0	50.2	46.9	44.1	44.3	47.5	41.4	36.6
2:00	48.6	48.9	45.5	43.3	44.2	47.5	40.3	36.2
3:00	47.3	49.1	45.7	43.3	44.8	48.1	42.4	37.4
4:00	49.3	51.8	48.0	45.4	47.0	50.4	44.2	39.5
5:00	52.5	55.5	50.4	47.9	50.8	53.8	50.1	44.4
6:00	55.9	58.7	55.1	50.8	54.8	56.2	53.3	49.9
7:00	56.7	59.1	55.8	53.2	56.0	57.4	53.7	50.7
8:00	55.3	57.9	54.0	51.1	54.7	55.0	50.8	47.0
9:00	52.2	55.6	50.1	45.4	57.4	57.5	45.6	42.6
10:00	49.9	53.9	45.8	39.2	52.4	54.2	45.9	42.8
11:00	51.2	54.3	47.6	40.2	52.4	51.7	46.1	43.5
12:00	50.6	54.0	47.1	40.9	51.6	53.9	48.5	45.1
13:00	51.4	54.1	47.4	41.0	53.0	53.4	48.5	45.9
14:00	51.7	55.1	49.1	43.2	55.3	54.9	49.3	46.5
Daytime Leq	**54**				**55**			
CNEL	**58**				**57**			

Leq – The energy equivalent steady-state sound level that contains the same acoustical energy as time-varying sound level during the same period.
L10 The sound level that is exceeded for 10 percent of the measurement period.
L50 The sound level that is exceeded for 50 percent of the measurement period.
L90 The level that is exceeded for 90 percent of the measurement period and is often used as an indication of the quietness of an environment.

Figure 4.11-1: Noise Measurement Location 1

Figure 4.11-2: Noise Measurement Location 2

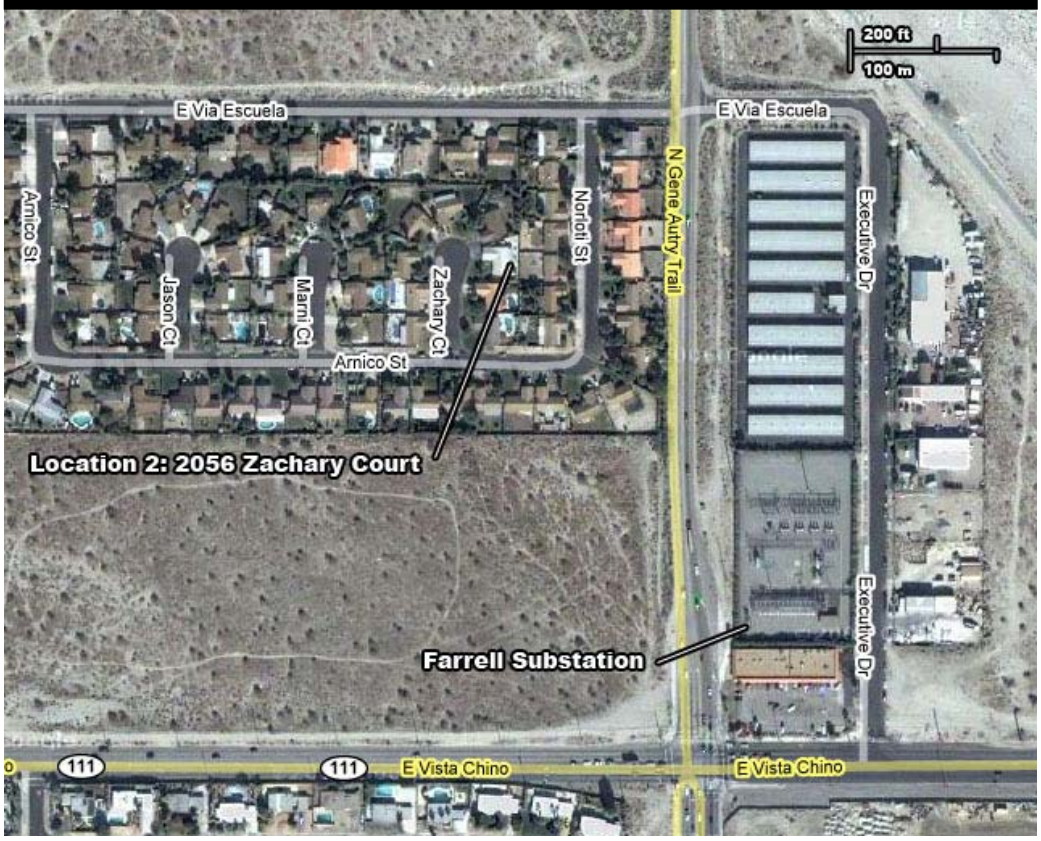
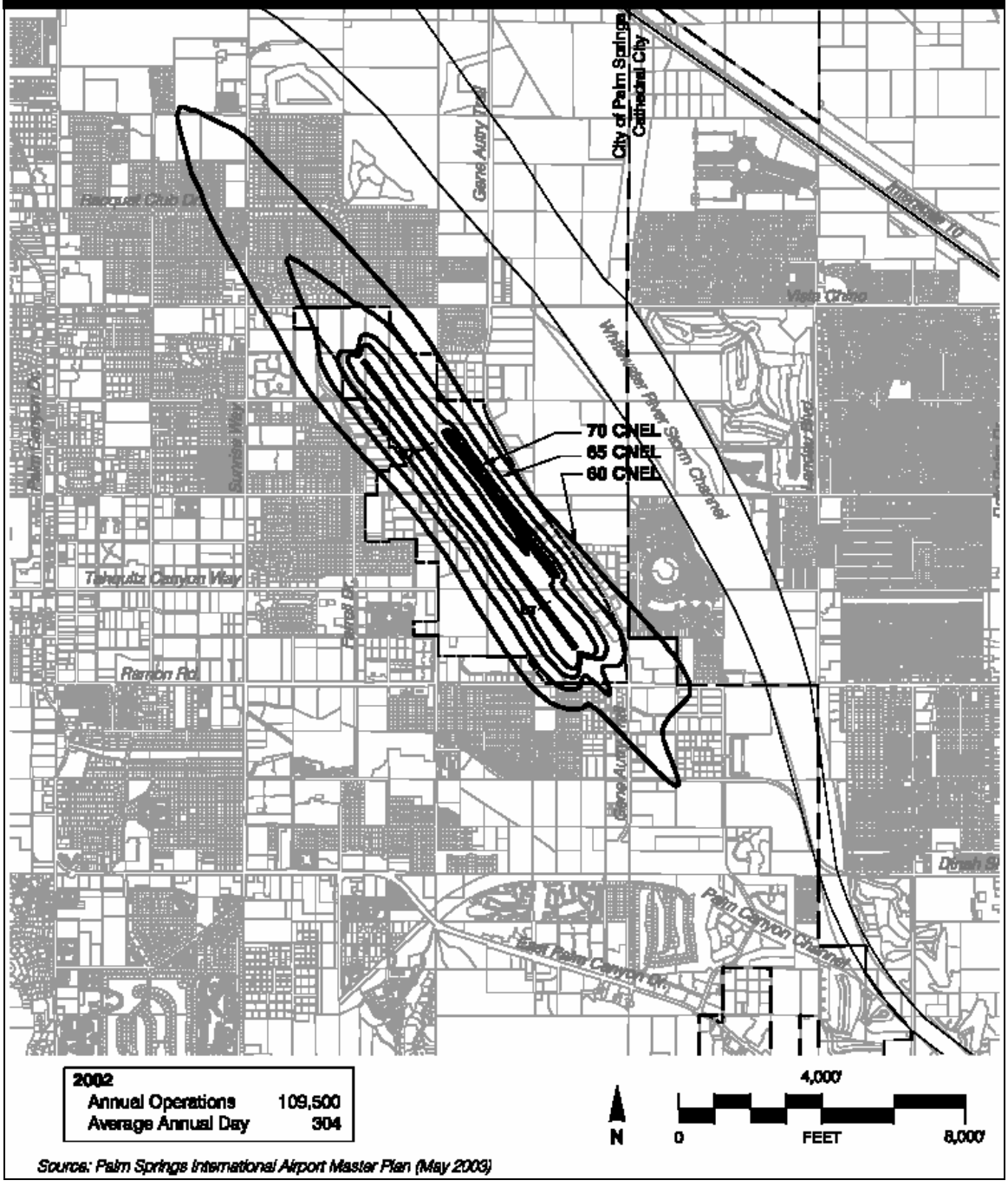


Figure 4.11-3: Palm Springs International Airport CNEL Noise Contours



Source: Palm Springs International Airport Master Plan (May 2003)

4.11.5.2 Subtransmission

Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1)

The Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1) is located within the boundaries of the City of Palm Springs. Except for a 0.125-mile segment where the proposed route borders a residential area, most of the route passes through undeveloped areas. The existing noise environment along the proposed route includes contributions from the following sources:

- local street traffic on Gene Autry Trail and Salvia Road
- occasional aircraft over-flights from the Palm Springs International Airport
- I-10 traffic
- UPRR activity
- existing substations
- natural sounds of the wind and birds

Based upon the ambient noise measurements described above, the CNEL along this subtransmission line would be 57 dBA and higher for locations near I-10.

Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4)

The Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4) is located adjacent to and within the Thousand Palms and Palm Desert communities. The proposed route passes within SCE ROWs and franchise locations through mostly undeveloped areas. Approximately 0.75 mile north of I-10, there is a residential area (Tri-Palm Estates) bordering one side of the SCE ROW. The existing noise environment along the programmed route includes contributions from the following sources:

- local street traffic on Ramon Road and Via Las Palmas
- occasional aircraft over-flights from the Palm Springs International Airport
- I-10 traffic
- UPRR activity
- existing substation
- natural sounds of the wind and birds

Based upon the ambient noise measurements described above, the CNEL along this subtransmission line would be 58 dBA and higher for locations near I-10.

4.11.5.3 Subtransmission Line Reconfigurations

Intersection of Bob Hope Drive and Dinah Shore Drive

The existing noise environment near this subtransmission line reconfiguration site includes contributions from the following sources:

- local street traffic in the area of the site

- occasional aircraft over-flights from the Palm Springs International Airport
- existing substation transformers
- natural sounds of the wind and birds

Based upon the ambient noise measurements described above, the CNEL at this subtransmission line reconfiguration site would be approximately 58 dBA.

Intersection of Date Palm Drive and Varner Road

The existing noise environment near this subtransmission line reconfiguration site includes contributions from the following sources:

- local street traffic in the area of the site
- occasional aircraft over-flights from the Palm Springs International Airport
- I-10 traffic
- UPRR activity
- natural sounds of the wind and birds

Based upon the ambient noise measurements described above, the CNEL at this subtransmission line reconfiguration site would be approximately 58 dBA.

Intersection of Portola Avenue and Gerald Ford Drive

The existing noise environment near this subtransmission line reconfiguration site includes contributions from the following sources:

- local street traffic in the area of the site
- I-10 traffic
- UPRR activity
- occasional aircraft over-flights from the Palm Springs International Airport
- existing substation transformers
- natural sounds of the wind and birds

Based upon the ambient noise measurements described above and the proximity to I-10 traffic and the UPRR, the CNEL at this subtransmission line reconfiguration site would be approximately 58 to 60 dBA.

4.11.5.4 Substations

The existing noise environment near the substations undergoing upgrades as part of the Proposed Project includes contributions from the following sources:

- local street traffic in the area of the site
- I-10 traffic
- UPRR activity
- occasional aircraft over-flights from the Palm Springs International Airport
- existing substation transformers and equipment

- natural sounds of the wind and birds

4.11.6 Impact Analysis

This section describes the noise impacts of the Proposed Project during construction and operation. For the purpose of evaluating the significance criteria (4.11.3), a substantial increase of 20 dB above the average daytime noise level would be considered significant.

The following statements address the Proposed Project with respect to the significance criteria.

- The project would not expose persons to or generate noise levels in excess of standards established in local general plans or noise ordinances or applicable standards of other agencies.

- The project would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels.

- The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

- During construction, the project would not cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receivers in the project vicinity above levels existing without the project, with the implementation of APMs NOISE-1, 2, and 3.

- Portions of the project are located within an airport land-use plan of a public airport or public-use airport but would not expose people working in the project area to excessive noise levels.

- The project is not located within the vicinity of a private airstrip.

Specific construction and operational impacts for each Proposed Project element are discussed in further detail below.

4.11.6.1 Construction Impacts

Transmission

The existing Devers-Coachella Valley 220 kV line would be looped into Mirage Substation through the construction of an approximately 0.80-mile 220 kV transmission line. In addition, approximately 1,320 linear feet of new, unpaved access road would be created. The construction activities associated with the access road and installation of the proposed 220 kV transmission line loop-in would occur over a period of 85 days.

Table 4.11-7: Proposed Devers-Coachella Valley 220 kV Loop-In Construction Equipment Noise Emissions summarizes the equipment that would be used for construction during each construction phase. It provides a list of the construction equipment, duration of activity, equipment noise levels, and the estimated load factor that might be used during construction. Not all of the equipment would be operating at the same location at the same time but would

pass through the area as service roads are constructed, LSTs and poles are replaced or installed, and transmission lines are installed.

TABLE 4.11-7
PROPOSED DEVERS-COACHELLA VALLEY 220 KV LOOP-IN
CONSTRUCTION EQUIPMENT NOISE EMISSIONS

Primary Equipment Description		Horse-power	Fuel	Days	Hours/ Day	Load Factor	Lmax @15 meters
Survey							
½-Ton Pick-Up Truck, 4X4	2	200	Gas	3	8	10%	80
Marshalling Yards							
1-Ton Crew Cab 4X4	1	300	Diesel	85	2	10%	77
30-Ton Crane Truck	1	300	Diesel	85	2	16%	83
10,000-Pound Rough Terrain Fork Lift	2	200	Diesel	85	5	50%	84
Truck, Semi, Tractor	1	350	Diesel	85	1	10%	84
Roads and Landing Work							
1-Ton Crew Cab 4X4	1	300	Diesel	3	5	10%	77
Road Grader	1	350	Diesel	3	6	40%	85
Track Type Dozer	1	350	Diesel	3	6	50%	86
Drum Type Compactor	1	250	Diesel	3	6	50%	85
Water Trucks	3	350	Diesel	3	10	50%	82
Lowboy Truck/Trailer	1	500	Diesel	3	4	50%	88
Excavator	1	300	Diesel	3	6	40%	85
Front End Loader	1	350	Diesel	3	6	40%	89
Install Foundations							
1-Ton Crew Cab Flat Bed, 4X4	4	300	Diesel	17	6	10%	83
30-Ton Crane Truck	2	300	Diesel	17	5	16%	86
Front End Loader	1	200	Diesel	17	5	40%	85
Diggers	2	500	Diesel	17	8	50%	88
4,000-Gallon Water Trucks	2	350	Diesel	17	5	50%	80
10-Yard^3 Concrete Mixer Trucks	6	425	Diesel	17	5	5%	85
Tower Legs, Haul & Erect							
1-Ton Crew Cab Flat Bed, 4X4	1	300	Diesel	4	6	10%	77
30-Ton Crane Truck	1	300	Diesel	4	8	16%	83
10,000-Pound Rough Terrain Fork Lift	1	200	Diesel	4	6	50%	84
40-Foot Flat Bed Truck & Trailer	1	350	Diesel	4	5	40%	84
10,000-Pound Rough Terrain Fork Lift	1	200	Diesel	5	8	50%	84
40-Foot Flat Bed Truck & Trailer	2	350	Diesel	5	10	40%	87
Tower Assembly							
80-Ton Rough Terrain Cranes	2	400	Diesel	8	8	16%	96
30-Ton Crane Truck	2	300	Diesel	8	8	16%	86
10,000-Pound Rough Terrain Fork Lift	2	200	Diesel	8	5	50%	84
¾-Ton Pick-Up Truck, 4X4	3	300	Diesel	8	10	10%	70
1-Ton Crew Cab Flat Bed, 4X4	4	300	Diesel	8	5	10%	83
Compressor Truck	2	350	Diesel	8	5	40%	87
Tower & Tubular Steel Pole Erection							
¾-Ton Pick-Up Truck, 4X4	1	300	Diesel	8	5	10%	65
1-Ton Crew Cab Flat Bed, 4X4	2	300	Diesel	8	5	10%	80
Compressor Truck	1	350	Diesel	8	5	40%	84
180-Ton Rough Terrain Crane	1	500	Diesel	8	6	16%	96
Tower Removal							
¾-Ton Pick-Up Truck, 4X4	1	300	Diesel	4	8	10%	65
40-Foot Flat Bed Truck	1	350	Diesel	4	8	40%	84

TABLE 4.11-7 PROPOSED DEVERS-COACHELLA VALLEY 220 KV LOOP-IN CONSTRUCTION EQUIPMENT NOISE EMISSIONS							
Primary Equipment Description		**Horse-power**	**Fuel**	**Days**	**Hours/ Day**	**Load Factor**	**Lmax @15 meters**
Conductor Installation							
1-Ton Crew Cab Flat Bed, 4X4	3	300	Diesel	10	8	10%	82
Wire Trucks & Trailers	2	350	Diesel	6	2	40%	87
Dump Truck (Trash)	1	350	Diesel	10	2	10%	84
¾-Ton Pick-Up Truck, 4X4	1	300	Diesel	10	10	10%	65
30-Ton Manitex	2	350	Diesel	10	6	50%	86
22-Ton Manitex	1	350	Diesel	10	8	50%	86
Sleeving Rigs	2	350	Diesel	10	2	50%	86
Log Truck & Trailer	1	500	Diesel	10	2	10%	84
20,000-Pound Rough Terrain Fork Lift	1	350	Diesel	10	2	50%	86
580-Case Backhoe	1	120	Diesel	6	2	16%	85
Spacing Carts	4	10	Diesel	6	4	50%	71
Static Truck	1	350	Diesel	6	2	50%	86
3-Drum Strawline Pullers	2	300	Diesel	6	4	50%	86
60lk Puller	1	525	Diesel	6	3	50%	88
Sag Cat W2 Winches	1	350	Diesel	6	2	50%	86
D8 Cats	4	300	Diesel	6	1	40%	94
Hughes 500 E Helicopter	1	650	Jet A	3	4	50%	95
Fuel, Helicopter Support Truck	1	300	Diesel	3	2	10%	84
Lowboy Truck & Trailer	1	500	Diesel	10	2	10%	84
Restoration							
1-Ton Crew Cab 4X4	1	300	Diesel	4	5	10%	77
Road Grader	1	350	Diesel	4	6	40%	85
Track Type Dozer	1	350	Diesel	4	6	40%	88
Drum Type Compactor	1	250	Diesel	4	6	40%	89
Water Trucks	3	350	Diesel	4	10	50%	82
Lowboy Truck/Trailer	1	500	Diesel	4	4	10%	84
Front End Loader	1	350	Diesel	4	6	40%	89
Excavator	1	300	Diesel	4	6	40%	85

Residential areas within approximately 250 feet of the center of construction could experience a substantial increase in daytime noise during the noisiest 10 days of construction. Residential property lines are approximately 200 feet west of the utility corridor centerline. No residential structures were identified within 250 feet of the corridor.

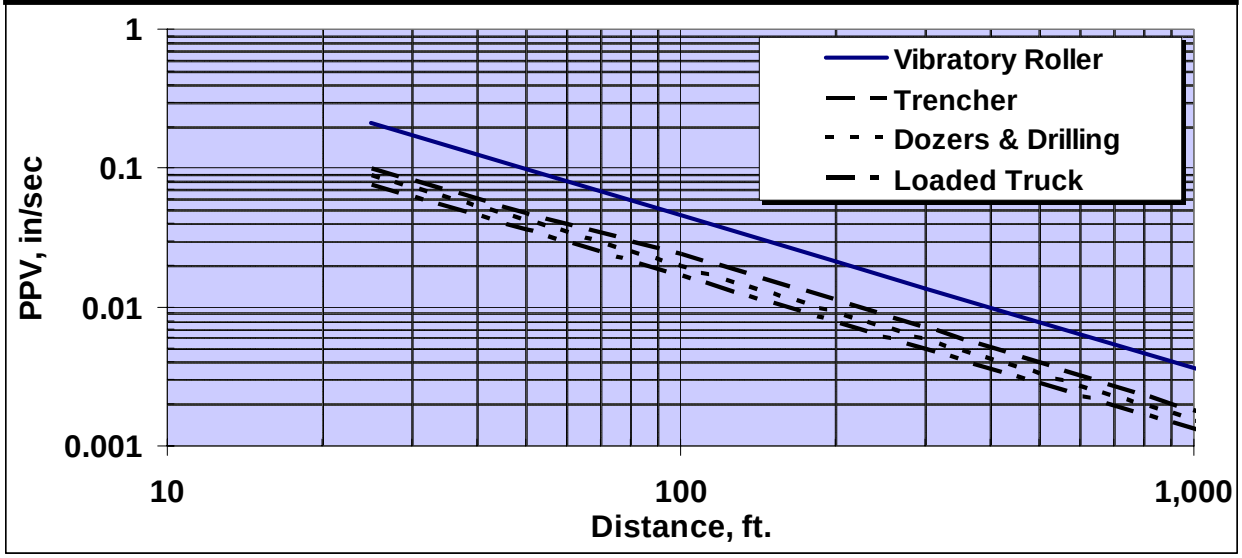
Construction worker noise exposure may exceed OSHA noise limits of 85 dBA within 50 to 65 feet of the heavy construction equipment. In compliance with OSHA requirements, worker hearing protection programs would be implemented on the construction site in areas where the OSHA noise limits would be exceeded.

Table 4.11-8: Vibration Source Amplitudes for Construction Equipment presents typical vibration amplitudes measured at 25 feet for various categories of equipment.

TABLE 4.11-8 VIBRATION SOURCE AMPLITUDES FOR CONSTRUCTION EQUIPMENT	
Equipment Reference	**PPV at 25 feet (in/sec)**
Vibratory Roller	0.210
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003
Sources: Federal Transit Administration 1995 and Jones and Stokes, 2004.	

Vibration amplitude would decrease with distance from the source, as presented in Figure 4.11-4: Construction Vibration Amplitudes. Damage potential can be estimated by comparing the vibration damage potential threshold criteria in Table 4.11-1: Guideline Vibration Damage Potential Threshold Criteria to the chart below (Figure 4.11-4: Construction Vibration Amplitudes). Vibration levels beyond 25 feet from construction activities would be below the damage threshold for older and newer residential buildings. Vibration levels beyond 200 feet from construction activities would be below the damage threshold for fragile buildings.

Figure 4.11-4: Construction Vibration Amplitudes



Noise or vibration impacts to sensitive land uses during construction of the Proposed Devers-Coachella Valley 220 kV Loop-In would be less than significant.

Subtransmission

Subtransmission line construction would occur over a period of approximately 15 months, involving many phases of activity. Table 4.11-9: Proposed Subtransmission Line Construction Equipment Noise Emissions provides a list of the construction equipment, duration of activity, equipment noise levels, and the estimated load factor that might be used during construction.

Not all of the equipment would be operating at the same location, at the same time, but it would pass through the area as service roads are constructed, poles are replaced or new poles installed, and subtransmission lines and fiber cabling are installed.

Construction worker noise exposure may exceed OSHA noise limits of 85 dBA within 50 to 65 feet of the heavy construction equipment. In compliance with OSHA requirements, worker hearing-protection programs would be implemented on the construction site in areas where the OSHA noise limits would be exceeded.

TABLE 4.11-9
PROPOSED SUBTRANSMISSION LINE CONSTRUCTION EQUIPMENT NOISE EMISSIONS

Equipment	Estimated Usage		Load Factor	Lmax @50 feet
	Hours/Day	Total Days		
1 Crew Truck (Gasoline)	10	171	10%	80
1 Crew Truck (Gasoline)	10	107	10%	80
2 Line Trucks	10	107	10%	80
2 Light Trucks	10	107	10%	80
2 Bucket Trucks	10	171	10%	80
1 Water Truck	10	107	50%	77
2 Truck Mounted Cranes	10	107	16%	86
1 Conductor Pulling Machine	10	24	50%	85
1 Conductor Tensioner (Gasoline)	10	24	50%	85
1 30-Ton Crane	10	14	16%	83
2 Backhoes	10	171	40%	83
1 Drilling Rig	10	24	20%	85
1 Concrete Truck	10	3	5%	77

Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1)

Construction activities would generate temporary and intermittent noise increases during the construction of the Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1). These improvements and upgrades would require materials transported to the site, use of construction worker crews, and use of equipment. Residential areas within approximately 200 feet of the center of subtransmission line construction could experience a substantial increase in daytime noise (approximately 6 days at each location). Property walls and intervening structures would decrease this distance. The nearest sensitive receptors to the proposed subtransmission line route would be nine residences on Norloti Street, located approximately 150 feet to the west of the SCE ROW. Construction activities would create short-term and intermittent noise levels but would comply with the City of Palm Springs noise regulations. Impacts would be less than significant with the implementation of appropriate APMs.

Noise or vibration impacts to sensitive land uses during construction of the Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1) would be less than significant.

Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4)

Construction activities would generate temporary and intermittent noise increases during the construction of the Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4).

These improvements and upgrades would require materials to be transported to the site, use of construction worker crews, and use of equipment. Residential areas within approximately 200 feet of the center of the subtransmission line construction could experience a substantial increase in daytime noise (approximately 6 days at each location). Property walls and intervening structures would decrease this distance. The nearest sensitive receptors to the proposed subtransmission line route would be 19 units along Bell Road, located approximately 100 feet west of the SCE right-of-way.

Construction activities would create short-term and intermittent noise levels but would comply with the local noise regulations, and impacts would be less than significant, with the implementation of APMs.

Noise or vibration impacts to sensitive land uses during construction of the Proposed Mirage-Santa-Rosa 115 kV Subtransmission Line (Route 4) would be less than significant, with the implementation of APMs.

Subtransmission Line Reconfigurations

Construction activities to replace four existing poles with four TSPs and three LWS poles at the corner of Bob Hope Drive and Dinah Shore Drive would generate temporary and intermittent noise increases for about 2 weeks during daytime hours. Residential areas within approximately 200 feet of the center of construction could experience a substantial increase in daytime noise. No residences have been identified that would be within this 200-foot radius. Construction activities would create short-term and intermittent noise levels but would be in compliance with the City of Palm Springs noise regulations, and impacts would be less than significant.

Construction activities to install one TSP and four wood poles near the corner of Varner Road and Date Palm Drive, in Cathedral City, would generate temporary and intermittent noise increases for about 2 weeks during daytime hours. Residential areas within approximately 200 feet of the center of construction could experience a substantial increase in daytime noise. No residences have been identified that would be within this 200-foot radius. Construction activities would create short-term and intermittent noise levels in compliance with the City of Cathedral City noise regulations, and impacts would be less than significant.

Construction activities to replace one wood pole with one TSP at the northwest corner of Gerald Ford Drive and Portola Avenue would generate temporary and intermittent noise increases for about 2 weeks during daytime hours. Residential areas within approximately 200 feet of the center of construction could experience a substantial increase in daytime noise. No residences have been identified that would be within this 200-foot radius. Construction activities would create short-term and intermittent noise levels but would be in compliance with the City of Palm Desert noise regulations, and impacts would be less than significant.

Substations

Construction activities associated with the upgrade and installation of a new transformer and other equipment installations and modifications at the Mirage Substation would occur over a period of approximately 15 months. The Proposed Project elements at Mirage Substation, as

described in Chapter 3: Project Description, include but are not limited to installation of a 280 MVA 220/115 kV transformer, four 220 kV circuit-breakers, and five 115 kV circuit breakers.

There would be minor improvements at the Garnet, Concho, Indian Wells, Santa Rosa, Devers, Farrell, Thornhill, Tamarisk, and Eisenhower substations. Additionally, a new driveway will be installed at the northeast corner of Farrell Substation adjacent to Executive Drive.

Table 4.11-10: Proposed Substation Construction Equipment Noise Emissions, summarizes the equipment that would be used for construction during each construction phase. Residential areas within the distances from the center of construction shown in Table 4.11-11: Proposed Substation Construction Impact Distance, Feet, could experience a substantial increase in daytime noise. No residences have been identified that would be within these distances.

Construction activities would create short-term and intermittent noise levels in compliance with applicable noise regulations, and impacts would be less than significant.

Telecommunications

As discussed in Chapter 3, existing fiber optic cables would be transferred from existing subtransmission poles to the new subtransmission poles to be installed for both the Proposed Farrell-Garnet (Route 1) and Proposed Mirage-Santa Rosa (Route 4) subtransmission lines. This transfer activity would occur simultaneously or immediately after the new 115 kV subtransmission line conductors are installed on the new poles.

There would be minor improvements at the Garnet, Concho, Indian Wells, Mirage, Santa Rosa, Devers, Farrell, Thornhill, Tamarisk, and Eisenhower substations, as well as the Edom Hill Communications Center. All relay work would be inside existing buildings at these substation sites.

Construction activities would create short-term and intermittent noise levels in compliance with local city and county noise regulations, and impacts would be less than significant.

4.11.6.2 Operational Impacts

Operation of the Proposed Project would likely produce no audible noise and no discernable vibration.

Audible noise from electrical transmission lines is related to corona effects. Corona is the ionization of the air at the surface of the energized electrical conductor and suspension hardware stemming from the high electrical field strength at the conductor surface. Corona-generated audible noise from transmission lines is generally characterized as a crackling or hissing noise. Discharges from the three different phase conductors occur at different times.

TABLE 4.11-10
PROPOSED SUBSTATION CONSTRUCTION EQUIPMENT NOISE EMISSIONS

Equipment	Lmax @15 meters	Load factor, percent	Work days	Hours/day	Number of Equipment									
					Mirage	Santa Rosa	Tamarisk	Thornhill	Concho	Devers	Eisenhower	Farrell	Garnett	Indian Wells
Civil Element														
Driller	86	50	2-50	8	1	–	–	–	–	1	1	1	–	–
Crew Trucks	80	10	5-80	2	2	–	1	–	–	1	1	1	–	–
14-Ton Crane	96	16	25	4	1	–	–	–	–	–	–	–	–	–
Dump Trucks	83	20	5-75	6	1	–	1	–	–	1	1	1	–	–
Tractors	84	40	5-75	6	1	–	1	–	–	1	1	1	–	–
5-Ton Truck	84	40	15	4	1	–	–	–	–	–	–	–	–	–
Forklift	78	40	75	4	1	–	–	–	–	–	–	–	–	–
Ditch Digger	80	50	5-55	6	1	–	–	–	–	–	1	1	–	–
Electrical Element														
Manlifts	80	50	5-100	6	2	–	1	–	–	1	1	1	–	–
Pick-Up Trucks	65	10	40-110	2	1	–	1	–	–	1	–	1	–	–
14-Ton Crane	85	16	90	6	1	–	–	–	–	–	–	–	–	–
Crew Trucks	80	10	40-110	2	2	–	1	–	–	1	1	1	–	–
150-Ton Crane	96	16	2-60	6	1	–	1	–	–	1	1	1	–	–
5-Ton Truck	84	40	50	2	1	–	–	–	–	–	–	–	–	–
Forklift	78	40	5-100	6	1	–	1	–	–	1	1	1	–	–
Carry-All Vehicles	84	50	15-110	2	2	1	1	1	1	1	1	1	1	1
Support Trucks	84	40	25	2	1	–	–	–	–	–	–	–	–	–
Transformer Assembly and Processing Element														
Carry-all	84	50	22	6	2	–	–	–	–	–	–	–	–	–
Manlifts	80	50	20	6	1	–	–	–	–	–	–	–	–	–
Forklift	78	40	22	6	1	–	–	–	–	–	–	–	–	–
50-Ton Crane	96	16	15	6	1	–	–	–	–	–	–	–	–	–
Crew Trucks	80	10	22	2	2	–	–	–	–	–	–	–	–	–
Maintenance Element														
Foreman Truck	77	10	1-40	2	1	–	1	–	–	1	1	1	–	–
Manlifts	80	50	40	6	1	–	–	–	–	–	–	–	–	–
Crew Trucks	80	10	2-110	2	2	–	1	–	–	1	1	1	–	–
Test Element														
Pick-Up Trucks	65	10	15-110	2	1	1	1	1	1	1	1	1	1	1

TABLE 4.11-11 PROPOSED SUBSTATION CONSTRUCTION IMPACT DISTANCE, FEET										
	Garnet	**Farrell**	**Eisenhower**	**Devers**	**Concho**	**Thornhill**	**Tamarisk**	**Santa Rosa**	**Mirage**	**Indian Wells**
Civil Element	– –	115	114	105	– –	– –	<50	– –	127	– –
Electrical Element	<50	79	79	79	– –	– –	79	– –	93	– –
Transformer Assembly and Processing Element	– –	– –	– –	– –	– –	– –	– –	– –	66	– –
Maintenance Element	– –	– –	<50	<50	– –	– –	<50	– –	<50	– –
Test Element	<50	– –	<50	<50	<50	<50	<50	<50	<50	<50

Although conductors are designed to minimize corona discharges, surface irregularities caused by damage, insects, raindrops, or contamination might locally enhance the electric field strength causing corona discharges to occur. The noise level generated by corona from overhead power lines would be affected by the following parameters:

- atmospheric conditions
- line length
- height above ground
- size of conductors and their configurations
- type of connection
- bundle conductor composition
- voltage gradient
- ground resistance

Modern transmission and subtransmission lines are designed, constructed, and maintained so that during dry conditions, they would operate below the corona inception voltage and the line would generate a minimum of corona-related noise. The corona hum typically would produce noise levels ranging up to 30 dBA, measured at the edge of the transmission line ROW during dry conditions. A noise level of 30 dBA would be practically unnoticeable, easily masked by other ambient noises. In foul weather conditions, water droplets and fog could produce corona discharges from high voltage lines that could be 5 to 20 dBA higher. This could occur when there is rain or when there is foggy weather.

Corona levels (and audible noise levels) would be highest during heavy rain, when the conductors are wet, but the noise generated by the rain likely would be greater than the noise generated by the corona, and thus the increased corona-related noise would not be noticeable.

Transmission

The noise from corona discharge and similar electrical phenomena for the Proposed Devers-Coachella Valley 220 kV Loop-In would be less than significant.

Maintenance of the lines might create short-term increases in noise to sensitive receptors located in the immediate vicinity. Maintenance would be rare, intermittent, and short-term. Noise impacts from maintenance of the lines would be less than significant.

In summary, noise impacts due to operation of the Proposed Devers-Coachella Valley 220 kV Loop-In would be less than significant.

Subtransmission

Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1)

The noise from corona discharge and similar electrical phenomena associated with the Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1) would be less than significant.

Maintenance of the lines might create short-term increases in noise to sensitive receptors located in the immediate vicinity. Maintenance would be rare, intermittent, and short-term. Noise impacts from maintenance of the line would be less than significant.

In summary, noise impacts due to operation of the Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1) would be less than significant.

Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4)

The noise from corona discharge and similar electrical phenomena associated with the Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4) would be less than significant.

Maintenance of the lines might create short-term increases in noise to sensitive receptors located in the immediate vicinity. Maintenance would be rare, intermittent, and short-term. Noise impacts from maintenance of the line would be less than significant.

In summary, noise impacts due to operation of the Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4) would be less than significant.

Subtransmission Line Reconfigurations

The noise from corona discharge and similar electrical phenomena associated with the proposed subtransmission line reconfigurations would be less than significant.

Maintenance of the lines might create short-term increases in noise to sensitive receptors located in the immediate vicinity. Maintenance would be rare, intermittent, and short-term. Noise impacts from maintenance on the lines would be less than significant.

In summary, noise impacts due to operation of the subtransmission line reconfigurations would be less than significant.

Substations

The noise associated with the operation of a new transformer at Mirage Substation would increase noise levels at the substation by less than 3 dB. The nearest residential community, about 0.25 mile to the west, is not expected to experience a significant noise increase, and noise impacts would be less than significant.

The proposed improvements at the other substations would not result in an increase in operational noise.

Telecommunications

Maintenance of the existing telecommunications lines might create short-term increases in noise to sensitive receptors located in the immediate vicinity. Maintenance would be rare, intermittent, and short-term. Noise impacts from maintenance on the telecommunications lines would be less than significant.

In summary, noise impacts due to operation of the telecommunications lines would be less than significant.

4.11.7 Alternatives

4.11.7.1 Farrell-Garnet 115kV Subtransmission Line Alternative Route 2

Construction and operation of the alternate route would generally follow the same activities and guidelines as discussed for the Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1). However, approximately 2.6 miles of Alternative Route 2 would pass adjacent to residential areas. Due to the proximity of the neighborhoods located adjacent to the line route, noise and vibration impacts potentially would be significant during construction. Implementation of the APMs identified above would reduce the impacts to a less than significant level.

In summary, noise impacts due to the construction and operation of the subtransmission line route alternative would be less than significant with the implementation of APMs; however, more residences would be exposed to short-term noise impacts during construction.

4.11.7.2 Farrell-Garnet 115kV Subtransmission Line Alternative Route 3

Construction and operation of the alternate route would generally follow the same activities and guidelines as discussed for the Proposed Farrell-Garnet 115 kV Subtransmission Line (Route 1). However, approximately 4 miles of Alternative Route 3 would pass adjacent to residential areas. Due to the proximity of the neighborhoods located adjacent to the line route, noise and vibration impacts potentially would be significant during construction. Implementation of the APMs identified above would reduce the impacts to a less than significant level.

In summary, noise impacts due to the construction and operation of the subtransmission line route alternative would be less than significant with the implementation of APMs; however, more residences would be exposed to short-term noise impacts during construction.

4.11.7.3 Mirage-Santa Rosa 115 kV Subtransmission Line Alternative Route 5

Construction and operation of the alternate route would generally follow the same activities and guidelines as discussed for the Proposed Mirage-Santa Rosa 115 kV Subtransmission Line (Route 4). However, due to the underground trenching associated with this alternative, higher levels of construction noise would occur, and approximately 1.2 miles of Alternative Route 5 would pass adjacent to residential areas. Due to the proximity of the neighborhoods located adjacent to the line route, noise and vibration impacts potentially would be significant during construction. Implementation of the APMs identified above would reduce the impacts to a less than significant level.

In summary, noise impacts due to the construction and operation of the subtransmission line route alternative would be less than significant with the implementation of APMs; however, more residences would be exposed to short-term noise impacts during construction.

4.11.8 References

City of Palm Springs. 1993. General Plan Land Use Element. March.

City of Palm Springs Municipal Code. Chapter 13.01 Noise Control.

City of Palm Desert. 2000. General Plan Land Use Element. May.

City of Palm Desert Municipal Code, Chapter 9.24 Noise Control.

Cathedral City Municipal Code, Chapter 11.96 Noise Control.

Jones & Stokes. 2004. *Transportation- and construction-induced vibration guidance manual.* June. (J&S 02-039.) Sacramento, CA. Prepared for California Department of Transportation, Noise, Vibration, and Hazardous Waste Management Office, Sacramento, California.

Occupational Safety & Health Administration. 29 Code of Federal Regulations, Subpart H, Section 1910.95, Occupational Noise Exposure, Washington, DC.

Palm Springs International Airport. 2006. Existing Noise Contours. Palm Springs, California.

Riverside County Integrated Project, Chapter 7: Noise Element.

U.S. Department of Transportation. 2006. FHWA Roadway Construction Noise Model (RCNM), 2006. U.S. Department of Transportation Research and Innovative Technology Administration, Cambridge, Massachusetts.

U.S. Environmental Protection Agency. 1974. “Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an adequate margin of Safety.” Washington, D.C.

THIS PAGE IS INTENTIONALLY BLANK