4.12 Noise

This section describes the existing noise environment in the vicinity of the Proposed Project. The potential impacts of the Proposed Project and the Alternative Project are also discussed. For purposes of this section, the Project Study Area is defined as the locations where work would be performed (described in Chapter 3.0, Project Description) plus the closest sensitive receptors that have the potential to be affected by project-related noise.

4.12.1 Environmental Setting

The Project Study Area includes the cities of Banning, Beaumont, Calimesa, Colton, Grand Terrace, Loma Linda, Palm Springs, Rancho Cucamonga, Redlands, San Bernardino, and Yucaipa, and unincorporated areas of Riverside and San Bernardino counties. The Proposed Project component in the City of Rancho Cucamonga is limited to improvements within the Mechanical Electrical Equipment Room (MEER) at Etiwanda Substation. The extent of this work within an existing facility would not have the potential to impact noise levels in the City of Rancho Cucamonga; therefore, the City of Rancho Cucamonga is not included for further discussion.

4.12.1.1 Noise and Vibration Background

Noise Fundamentals

Noise is usually defined as "unwanted sound." The definition of noise as unwanted sound implies that it has an adverse effect on people and their environment. The adverse effects of noise include interference with concentration, communication, and sleep. At the highest levels, noise can induce hearing damage.

Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). The human ear does not respond uniformly to sounds at all frequencies, being less sensitive to very low and high frequencies than to medium frequencies that correspond with human speech. In response, the A-weighted noise level (or scale) has been developed. The A-weighted scale corresponds to a human being's subjective judgment of sound levels. This A-weighted sound level is called the "noise level" referenced in units of "dBA." All sound levels discussed in this Proponent's Environmental Assessment (PEA) Noise Section are A-weighted.

The A-weighted sound level used for a certain time period is called the Equivalent Sound Pressure Level (L_{eq}). The L_{eq} is the level of a constant sound, which, in the given situation and time period, has the same sound energy as a time-varying sound.

Human Perception of Noise. The human perception of noise can vary greatly from person to person. In addition to a person's unique sensitivity to noise, factors that influence individual responses include the intensity, frequency, and time pattern of the noise; the amount of background noise present prior to the intruding noise; and the nature of human activity that is exposed to the noise. Community noise levels are generally

considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA.

Another metric used to determine the impact of environmental noise considers the differences in human responses to daytime and nighttime noise levels. During the evening and at night, exterior background noises are generally lower than during the day. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are therefore more sensitive to intrusive noises. To account for human sensitivity to evening and nighttime noise levels, the Daytime-Nighttime Noise Level (DNL, also abbreviated as L_{dn}) and Community Noise Equivalent Level (CNEL) metrics were developed. The DNL accounts for the greater annoyance of noise during the night (10 p.m. to 7 a.m.). The CNEL accounts for the greater annoyance of noise during the evening (7 p.m. to 10 p.m.) and nighttime hours.

It is widely accepted in the acoustical industry that the average person can barely perceive a change of 3 dBA. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as twice as loud.

Sound Propagation and Attenuation. Individual sound sources are considered "point sources" when the distance from the source is large compared to the size of the source, such as the distance of an average resident from a substation transformer bank. Sound from a point source radiates hemispherically, which yields a 6 dB sound level reduction for each doubling of the distance from the source. If the sound source is quite long in one dimension, such as transmission lines, the source is considered a "line source." Sound from a line source radiates cylindrically, which typically yields a 3 dB sound level reduction for each doubling of the distance from the source.

Other factors that affect the attenuation of noise include air, which absorbs a certain amount of sound energy, and atmospheric effects (wind, temperature, and precipitation). Terrain type and vegetation levels also influence the sound propagation and attenuation over large distances from the source. Sound levels can also be attenuated by manmade or natural barriers. Intervening noise barriers, such as sound walls, hills, solid walls, or berms, can reduce noise levels up to 15 dBA at the receptor location.

Acoustical terms are defined in Table 4.12-1, Definitions of Acoustical Terms.

Table 4.12-1: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting 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 levels in this report are A-weighted, unless reported otherwise.

Table 4.12-1: Definitions of Acoustical Terms

Term	Definition
L_{02}, L_{08}, L_{25}, L_{50}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level for 2 percent, 8 percent, 25 percent, and 50 percent of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 decibels to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 decibels to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval.

Source: Handbook of Acoustical Measurement and Noise Control, 1991.

Vibration Fundamentals

Construction activities could result in varying degrees of ground vibration, depending on the kind of equipment and operations involved, and the distances between the construction activities and the nearest receptors. The effects of construction vibration may be imperceptible at the lowest levels, produce low rumbling sounds and detectable vibrations at moderate levels, and damage nearby structures at the highest levels.

Several different metrics are used to quantify vibration. The peak particle velocity (PPV) is one of several metrics used to quantify vibration and is defined as the maximum instantaneous peak of the vibration signal. Peak particle velocity is typically expressed in units of inches per second (in/sec) and is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration (FTA, 2006).

4.12.1.2 Background Noise Levels

The primary existing noise sources in the Project Study Area are transportation facilities. Traffic on Interstate 215 (I-215), Interstate 10 (I-10), Redlands Boulevard, San Timoteo Canyon Road, Reche Canyon Road, and other local streets is the dominant source contributing to the ambient noise levels in the Proposed Project vicinity. In addition to traffic noise, the existing environment contains noise from existing rail lines, overhead aircraft, and commercial/industrial land uses.

Existing ambient noise levels were monitored at various representative noise-sensitive receptor locations throughout the Project Study Area on January 30 and 31; February 5

and 6; and February 13 through 15, 2013. Both short-term and long-term ambient noise level measurements were conducted at locations identified in Figure 4.12-1, Noise Monitoring Locations in Appendix K, Noise Calculations and Maps. The short-term ambient noise level measurements were conducted for 20 minutes at each location. The long-term (24-hour) ambient noise level measurements were conducted to provide hourly intervals over a 24-hour period at five locations. Descriptions of the short-term and long-term ambient noise level measurement locations are presented in Table 4.12-2, Physical Location of Noise Level Measurements.

The short-term and long-term ambient noise level measurement locations are shown in Appendix K, Noise Calculations and Maps, which also includes the noise level measurement results.

Table 4.12-2: Physical Location of Noise Level Measurements

Monitor No.	Location Description	Noise Sources	Comments
ST-1	11750 Mount Vernon Avenue, Grand Terrace; At The Highlands Apartment Homes between Building Q (Units 162–165, 262–265) and Building R (Units 166–169, 266–269)	Traffic on Canal Street; faint traffic on I-215; aircraft noise; dog barking; faint train horn	Wrought-iron fence along the property line
ST-2	22780 Vista Grande Way, Grand Terrace; near the mailbox in front of the house	Faint traffic noise on I-215; vehicle pass-by; dump truck pass-by; emergency sirens in the background; dogs barking; bird noise	Single-family residential area
ST-3	2096 Skyview Drive, Colton; near the cul-de-sac; on the side of the property	Some aircraft noise; dog barking faintly	None
ST-4	11862 Reche Canyon Road, Colton; in the backyard	Traffic on Reche Canyon Road; some aircraft noise; noise from chickens and roosters	Single-family residence
ST-5	11019 Ragsdale Road, Loma Linda; near the backyard	Vehicle pass-by and aircraft noise	None
ST-6	25896 Juniper Street, Loma Linda; at the cul-de-sac of Juniper Street	Faint traffic on I-10; faint aircraft noise; and bird noise	None
ST-7	1255 Research Drive, Redlands; in the parking lot	Traffic on I-10 and Lugonia Avenue; noise from reverse signal on a vehicle nearby	None
ST-8	32300 San Timoteo Canyon Road, Redlands; at Fisherman's Retreat, southwest corner of the property	Bulldozer idling and driving around the area; hammer noise; dogs barking intermittently in the background; faint train horn; and some activity from the mobile homes	None
ST-9	34556 Venturi Avenue, Beaumont, at the trail access near the backyard	Aircraft noise; dog barking faintly; and intermittent noise from truck reverse signal	Single-family residences

Table 4.12-2: Physical Location of Noise Level Measurements

Monitor No.	Location Description	Noise Sources	Comments
ST-10	Trevino Park in Beaumont; at a picnic table on the north side of the park; located south of Palmer Avenue and east of Cherry Valley Boulevard	Faint traffic on I-10; some traffic on Cherry Valley Boulevard; faint train horn	None
ST-11	10961 Desert Lawn Drive, Beaumont; between Units 144 and 145; near the corner of Pecan Avenue and Cherry Tree Lane	Traffic on I-10; some aircraft noise; bird noise	Residential Community
ST-12	1106 Cedar Hollow Road, Beaumont; at the cul-de-sac of Cedar Hollow Road	Some aircraft noise; vehicle pass-by; person talking briefly	None
ST-13	4565 Hillside Drive, Banning; at the cul-de-sac of Hillside Drive	Some aircraft noise; dogs barking briefly	None
ST-14	2384 Murray Street, Banning; at the cul-de-sac	Faint train horn; aircraft noise; bird noise	None
ST-15	Southern terminus of Dailey Road; in Banning	Distant traffic; planes; bird noise	Freeway is audible, but quiet
ST-16	Community center near 13000 Malki Road, Banning	Traffic on I-10, Malki Road; some aircraft noise; bird noise; parking lot activities	Taken at the community center to represent the nearest backyard from Malki Road
ST-17	54210 Kalsman Drive, White Water; in front of the home on the east side of the property	Bird and aircraft noise; faint train noise; dog barking	None
LT-1	3048 Prado Lane, Colton. In the backyard of the residence	Background ambient noise – There were no major noise sources at this location	None
LT-2	11651 Nelson Street, Loma Linda. In the backyard of the residence	Background ambient noise – There were no major noise sources at this location	None
LT-3	34132 Ogrady Court, Beaumont. In the backyard of the residence	Background ambient noise – There were no major noise sources at this location	None
LT-4	503 Cedar View Drive, Beaumont. In the backyard of the residence	Background ambient noise – There were no major noise sources at this location	None
LT-5	55730 Dan Piefrre Road, White Water. In the front yard of the residence	Background ambient noise – There were no major noise sources at this location	None

Source: LSA Associates, Inc., February 2013.

ft = feet I-10 = Interstate 10 I-215 = Interstate 215
LT = Long-Term ST = Short-Term

The short-term and long-term ambient noise levels measured in the Project Study Area are summarized in Table 4.12-3, Existing Ambient Noise Monitoring Results. The data

shown in Table 4.12-3, Existing Ambient Noise Monitoring Results, indicate the existing short-term ambient noise levels range from 39.2 to 63.1 dBA L_{eq} and the existing long-term ambient noise levels range from 25.2 to 63.8 dBA L_{eq}.

Table 4.12-3: Existing Ambient Noise Monitoring Results

Monitor No.	Start Date	Start Time	Duration	dBA L_{eq}
ST-1	1/30/2013	11:11 a.m.	20 minutes	57.0
ST-2	1/30/2013	11:54 a.m.	20 minutes	54.0
ST-3	1/30/2013	12:40 p.m.	20 minutes	44.4
ST-4	1/30/2013	1:28 p.m.	20 minutes	50.5
ST-5	1/30/2013	3:08 p.m.	20 minutes	44.1
ST-6	1/30/2013	3:37 p.m.	20 minutes	48.1
ST-7	1/30/2013	4:21 p.m.	20 minutes	63.1
ST-8	1/31/2013	11:20 a.m.	20 minutes	51.8
ST-9	1/31/2013	12:47 p.m.	20 minutes	39.2
ST-10	1/31/2013	1:27 p.m.	20 minutes	47.6
ST-11	1/31/2013	1:58 p.m.	20 minutes	56.5
ST-12	1/31/2013	3:02 p.m.	20 minutes	46.1
ST-13	1/31/2013	3:39 p.m.	20 minutes	46.2
ST-14	1/31/2013	4:16 p.m.	20 minutes	47.6
ST-15	2/13/2013	12:01 p.m.	20 minutes	53.7
ST-16	2/13/2013	12:01 p.m.	20 minutes	60.5
ST-17	2/13/2013	11:06 a.m.	20 minutes	47.2
LT-1	2/5/2013	1:00 p.m.	24 hours	25.2–52.5
LT-2	2/14/2013	5:00 p.m.	24 hours	40.7–55.8
LT-3	2/14/2013	4:00 p.m.	24 hours	37.9–58.3
LT-4	2/13/2013	10:00 a.m.	24 hours	43.8–51.8
LT-5	2/13/2013	11:00 a.m.	24 hours	45.3–63.8

Source: LSA Associates, Inc., February 2013.
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels

4.12.1.3 Common Sound Levels and Sources

The ambient or background noise levels are generally higher in urban areas than in outlying, less-developed areas. Table 4.12-4, Typical A-Weighted Noise Levels, shows common sound levels and their noise sources.

Table 4.12-4: Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet	**— 105 —**	
	— 100 —	
Gas lawn mower at 3 feet	**— 95 —**	
	— 90 —	

Table 4.12-4: Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Diesel truck at 50 feet at 50 mph	**— 85 —**	Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime	**— 75 —**	
Gas lawn mower, 100 feet	**— 70 —**	Vacuum cleaner at 10 feet
Commercial area	**— 65 —**	Normal speech at 3 feet
Heavy traffic at 300 feet	**— 60 —**	
	— 55 —	Large business office
Quiet urban daytime	**— 50 —**	Dishwasher next room
	— 45 —	
Quiet urban nighttime	**— 40 —**	Theater, large conference room (background)
Quiet suburban nighttime	**— 35 —**	
	— 30 —	Library
Quiet rural nighttime	**— 25 —**	Bedroom at night, concert
	— 20 —	
	— 15 —	Broadcast/recording studio

Source: Caltrans, Technical Noise Supplement, November 2009.

4.12.1.4 Construction Equipment Noise Levels

Typical construction equipment noise levels (maximum instantaneous noise level [L_{max}]) recommended for noise impact assessments based on the acoustical use factor and a distance of 50 feet between the equipment and a noise receptor are shown in Table 4.12-5, Typical Maximum Construction Equipment Noise Levels (L_{max}).

Table 4.12-5: Typical Maximum Construction Equipment Noise Levels (L_{max})

Equipment Description	Acoustical Use Factor[1]	L_{max} at 50 feet[2]	Actual Measured L_{max} at 50 feet[3]
Auger Drill Rig	20	85	84
Backhoes	40	80	78
Bucket Truck[4]	20	85	75
Compactor (ground)	20	80	83
Cranes	16	85	81
Dozers	40	85	82
Dump Truck	40	84	76
Excavators	40	85	81
Flat Bed Trucks	40	84	74
Front-End Loaders	40	80	79
Graders	40	85	N/A[5]
Haul Trucks	40	84	76
Pick-up Trucks	40	55	75

Table 4.12-5: Typical Maximum Construction Equipment Noise Levels (L_{max})

Equipment Description	Acoustical Use Factor[1]	L_{max} at 50 feet[2]	Actual Measured L_{max} at 50 feet[3]
Scrapers	40	85	84
Tractors	40	84	N/A

Source: FHWA Roadway Construction Noise Model, January 2006.
[1] The percentage of time during which the equipment is operating at the maximum noise level.
[2] Maximum noise levels was developed based on Spec 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project .
[3] Maximum noise levels was developed based on the average noise level measured of each piece of equipment during the CA/T program in Boston, Massachusetts.
[4] It was assumed that the bucket truck is equivalent to a man lift.
[5] Since the maximum noise level based on the average noise level measured for this piece of equipment was not available, the maximum noise level developed based on Spec 721.560 was used.
Note: Noise levels reported in this table are rounded to the nearest whole number.
N/A = Not Available L_{max} = maximum instantaneous noise level

4.12.1.5 Corona Noise

When a transmission or subtransmission line is in operation, an electric field is generated in the air surrounding the conductors, forming a "corona." A corona results from 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. The amount of corona produced by a transmission line is a function of the voltage of the line, the diameter of the conductor (or bundle of conductors), line length, type of connection, the elevation of the line above sea level, ground resistance, the condition of the conductor and hardware, and the local weather conditions. Corona is less noticeable on lines operated at lower voltages. Raindrops, snow, fog, hoarfrost, and condensation accumulated on the conductor surface can increase corona.

Corona generates audible noise during the operation of transmission and subtransmission lines. The noise is generally characterized as a crackling, hissing, or humming noise. During wet or foul weather conditions, the conductor would produce the greatest amount of corona noise. The noise is most noticeable during wet conductor conditions such as rain or fog. The Electric Power Research Institute (EPRI) has conducted several studies of corona effects (EPRI 1979 and 1987). The typical noise levels for transmission lines with wet conductors are shown in Table 4.12-6, Transmission and Subtransmission Line Voltage and Audible Noise Levels. However, during heavy rain, the ambient noise generated by the falling raindrops would typically be greater than the noise generated by corona. Audible noise from transmission lines is often masked by the background noise at locations beyond the edge of the right of way (ROW), particularly where the line is near a source of background noise such as a freeway.

Table 4.12-6: Transmission and Subtransmission Line Voltage and Audible Noise Levels

Line Voltage (kV)	Audible Noise Level Directly Below the Conductor (dBA)
138	33.5
240	40.4

Table 4.12-6: Transmission and Subtransmission Line Voltage and Audible Noise Levels

Line Voltage (kV)	Audible Noise Level Directly Below the Conductor (dBA)
360	51.0

Source: Electric Power Research Institute, 1979 and 1987.
dBA = A-weighted decibels kV = kilovolt

4.12.1.6 Location of Airports in the Project Study Area

There are several airports located in the vicinity of the existing WOD corridor that could potentially expose workers in the Project Study Area to aircraft noise. San Bernardino International Airport and Redlands Municipal Airport are approximately 5 miles north of the Proposed Project near the west end of the existing WOD corridor; Banning Airport is located near the midpoint of the WOD corridor, approximately 2 miles south; and Palm Springs International Airport is located near the east end of the existing WOD corridor, approximately 8 miles to the south.

4.12.2 Regulatory Setting

4.12.2.1 Federal Regulatory Setting

There are no federal regulations related to noise applicable to the Proposed Project.

4.12.2.2 State Regulatory Setting

There are no state regulations related to noise applicable to the Proposed Project.

4.12.2.3 Local Regulatory Setting

The California Public Utilities Commission (CPUC) has jurisdiction over the siting and design of the Proposed Project because the CPUC regulates and authorizes the construction of investor-owned public utility (IOU) facilities. Although such projects are exempt from local land use and zoning regulations and permitting, General Order (GO) No. 131-D, Section III.C requires "the utility to communicate with, and obtain the input of, local authorities regarding land-use matters and obtain any nondiscretionary local permits."

WOD construction would comply with local noise ordinances, to the extent practicable. In limited circumstances, SCE may need to work outside the local ordinances to, among other things, facilitate major crossings, or when loads on the lines are reduced (as explained in Section 3.10 Construction Equipment and Personnel). In these circumstances, SCE would coordinate with local authorities to minimize conflicts with the established local noise ordinances.

Local Noise Requirements

City of Banning. The City of Banning's Municipal Code limits operation-related noise affecting residential, industrial, and commercial uses. For residential uses, the exterior daytime noise level shall not exceed the base ambient noise level of 55 dBA for 30 minutes in any hour and the exterior nighttime level shall not exceed the base ambient noise level of 45 dBA for 30 minutes in any hour. For industrial and commercial uses, the noise level shall not exceed 75 dBA at any time (City of Banning, California § 8.44.050, Base Ambient Noise Level).

The City of Banning's Municipal Code exempts construction-related noise occurring between the hours of 7:00 a.m. and 6:00 p.m., provided that these activities do not at any time exceed 55 dBA for an interval of more than 15 minutes per hour when measured in the interior of the nearest occupied residence or school. In addition, the City Building Inspector may permit construction outside of these daytime hours if the official determines that public health and safety would not be impaired by the construction noise (Banning, Cal. § 8.44.090, Noise prohibited; unnecessary noise standard). For analysis purposes, a maximum exterior noise standard was derived by adding 20 dBA[1] (representing typical building attenuation) to the published 55 dBA L_{25} interior noise standard and a 10 dBA[2] increase to convert the L_{25} to a maximum noise level standard. Based on the City's interior noise standard and the assumptions described above, the maximum exterior noise standard would be 85 dBA L_{max}.

City of Beaumont. The City of Beaumont's Municipal Code limits construction-related noise affecting residential uses to the hours between 6:00 a.m. and 8:00 p.m. These activities include the erection, excavation, demolition, alteration or repair of any structure or improvement (City of Beaumont, California § 9.02.030, Prohibited Noise in Residential Zones).

The City of Beaumont does not have any noise level standards for operation-related noise. For the purposes of this analysis, County of Riverside standards will be used.

City of Calimesa. The City of Calimesa's Municipal Code limits operation-related noise affecting public utility facilities and residential uses. The ordinance states that single-family and low-density residential zones shall not be subject to noise levels greater than 50 dBA L_{eq} and other residential uses shall not be subject to noise levels greater than 55 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. According to this ordinance, during nighttime hours, between 10:00 p.m. and 7:00 a.m., single-family and low-density residential zones shall not be subject to noise levels greater than 40 dBA L_{eq}, while other residential uses shall not be subject to noise levels greater than 50 dBA L_{eq}. It also specifically states that electrical transmission lines are subject to these limits at or beyond

[1] Based on the June 1995 Caltrans Highway Traffic Noise Analysis and Abatement Policy and Guidance for a light frame building type with closed ordinary sash windows, which is typically associated with residential structures.

[2] Based on the Model Community Noise Ordinance, a 15 dBA increase in noise would convert the L_{25} to L_{max}. To be conservative, a 10 dBA noise increase was used instead of 15 dBA.

6 feet from the utility easement (City of Calimesa, California § 8.15.080, Construction equipment).

Also, the City of Calimesa's Municipal Code limits construction activities to between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and between 10:00 a.m. and 5:00 p.m. on weekends or holidays. No construction equipment is allowed to cause noise in excess of 75 dBA for up to 8 hours during any 24-hour period, 78 dBA for up to 4 hours during any 24-hour period, 81 dBA for up to 2 hours during any 24-hour period, 84 dBA for up to 1 hour during any 24-hour period, 87 dBA for up to 30 minutes during any 24-hour period, and 90 dBA for up to 15 minutes during any 24-hour period when measured at a residential property line (Ibid.).

City of Colton. The City of Colton's Municipal Code limits operation-related noise to not exceed a maximum sound level of 65 dBA radiated by any use of facility, when measured at the boundary line of the property on which the sound is generated. The sound level shall not be obnoxious by reason of its intensity, pitch, or dynamic characteristics, as determined by the City (City of Colton, California § 18.42.040, Noise).

The City's Municipal Code also requires vibration from all activities to not generate ground vibration by equipment other than motor vehicles, trains, or by temporary construction or demolition, which is perceptible without instruments by the average person at or beyond any lot line of the lot containing the activities (City of Colton, California § 18.42.050, Vibration).

The City's Municipal Code has not adopted time periods during which exterior construction activities would not be permitted nor any maximum noise level associated specifically with construction noise. For the purposes of this analysis, the standards set by the County of San Bernardino Code will be used.

City of Grand Terrace. The City of Grand Terrace's Municipal Code limits construction-related noise and vibration to between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday. No construction activities are allowed on Sundays and Federal holidays (City of Grand Terrace, California § 8.108.040, Special Activities).

The City of Grand Terrace currently does not have noise level standards for operation-related noise. For the purposes of this analysis, the standards set by the County of San Bernardino Code will be used.

City of Loma Linda. The City of Loma Linda's Municipal Code limits construction-related noise to between the hours of 7:00 a.m. and 10:00 p.m., Monday through Sunday (City of Loma Linda, California § 9.20.050, Prohibited Noises).

The City of Loma Linda only has noise level standards for transportation-related noise sources and currently does not have any noise level standards for other operation-related noise. For the purposes of this analysis, the standards set by the County of San Bernardino Code will be used.

City of Palm Springs. The City of Palm Springs' Municipal Code limits operation-related noise affecting residential, commercial, and industrial uses. For low density residential uses, exterior noise levels between the hours of 7:00 a.m. and 6:00 p.m. shall not exceed 50 dBA, exterior noise levels between the hours of 6:00 p.m. and 10:00 p.m. shall not exceed 45 dBA, and exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 40 dBA. For high density residential uses, exterior noise levels between the hours of 7:00 a.m. and 6:00 p.m. shall not exceed 60 dBA, exterior noise levels between the hours of 6:00 p.m. and 10:00 p.m. shall not exceed 55 dBA, and exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 50 dBA. For commercial uses, exterior noise levels between the hours of 7:00 a.m. and 6:00 p.m. shall not exceed 60 dBA, exterior noise levels between the hours of 6:00 p.m. and 10:00 p.m. shall not exceed 55 dBA, and exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 50 dBA. For industrial uses, exterior noise levels between the hours of 7:00 a.m. and 6:00 p.m. shall not exceed 70 dBA, exterior noise levels between the hours of 6:00 p.m. and 10:00 p.m. shall not exceed 60 dBA, and exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 55 dBA (City of Palm Springs, California § 11.74.032, Noise Level Limit).

The City of Palm Springs' Municipal Code limits construction-related noise to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday and 8:00 a.m. to 5:00 p.m. on Saturday (City of Palm Springs, California § 8.04.220, Limitation of Hours of Construction).

The City of Palm Springs' Municipal Code also prohibits operating or permitting the operation of any device that creates a vibration that is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at 150 feet from the noise source if on a public space or public ROW (City of Palm Springs, California § 11.74.043(J), Loud, Unusual Noises).

City of Redlands. The City of Redlands' Municipal Code limits operation-related noise affecting residential, public space, institutional, commercial, and industrial uses. For residential (single-family and multifamily), public space, and institutional uses, exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 50 dBA for a cumulative period of more than 30 minutes and exterior noise levels between the hours of 7:00 a.m. and 10:00 p.m. shall not exceed 60 dBA for a cumulative period of more than 30 minutes. For commercial uses, exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 60 dBA for a cumulative period of more than 30 minutes and exterior noise levels between the hours of 7:00 a.m. and 10:00 p.m. shall not exceed 65 dBA for a cumulative period of more than 30 minutes. For industrial uses, exterior noise levels shall not exceed 75 dBA at any time (City of Redlands, California § 8.06.070, Exterior Noise Limits).

The City of Redlands's Municipal Code also prohibits the operation of any device that creates a vibration that is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at 150 feet from the noise source if on a public space or public ROW (City of Redlands, California § 8.06.090(G), Noise Disturbance).

The City of Redlands' Municipal Code exempts construction-related noise occurring between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and Saturdays and prohibits construction activities taking place at any time on Sundays or Federal holidays. In addition, motorized equipment used in such activity must be equipped with functioning mufflers (City of Redlands, California § 8.06.120, Exemptions).

City of San Bernardino. The City of San Bernardino's Municipal Code limits construction-related noise to between the hours of 7:00 a.m. and 8:00 p.m., Monday through Sunday (City of San Bernardino, California § 8.54.070, Disturbances from Construction Activity).

The City of San Bernardino only has noise level standards for transportation-related noise and currently does not have noise level standards for operation-related noise. For the purposes of this analysis, the standards set by the County of San Bernardino Code will be used.

City of Yucaipa. The City of Yucaipa's Municipal Code limits operation-related noise affecting residential, professional services, other commercial uses, and industrial uses. For residential uses, exterior noise levels between the hours of 7:00 a.m. and 10:00 p.m. shall not exceed 55 dBA for a cumulative period of more than 30 minutes and exterior noise levels between the hours of 10:00 p.m. and 7:00 a.m. shall not exceed 45 dBA for a cumulative period of more than 30 minutes. For professional services, exterior noise levels shall not exceed 55 dBA at any time. For other commercial uses, exterior noise levels shall not exceed 60 dBA at any time. For industrial uses, exterior noise levels shall not exceed 70 dBA at any time (City of Yucaipa, California § 87.0905, Noise).

The City of Yucaipa's Municipal Code limits construction-related noise and vibration between the hours of 7:00 a.m. and 7:00 p.m. except on Sundays and Federal holidays. These activities include temporary construction, repair, or demolition (Ibid.).

County of Riverside. The County of Riverside regulates noise from stationary noise sources in County Code Chapter 9.52, Noise Regulations.

County of Riverside Municipal Code maximum noise levels for stationary noise sources created by a person to the property line of a sensitive receptor (medium density residential and low density residential in the Project Study Area) are to remain below 45 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.) and are not to exceed 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) (Riverside County, California Code § 9.52.040, General Sound Level Standards).

The County of Riverside's Code exempts construction-related noise emanating from private construction projects located within one-quarter mile from an inhabited dwelling provided that construction occurs between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September, and between the hours of 7:00 a.m. and 6:00 p.m. during the months of October through May (Riverside County, California Code § 9.52.020(I), Exemptions).

The Code also restricts the creation of special sound sources (e.g., power tools and equipment). According to this ordinance, the operation of power tools and equipment is restricted from occurring between the hours of 10:00 p.m. and 8:00 a.m. when the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment are located. In addition, operation of power tools or equipment is restricted from occurring at any other time when they are audible to the human ear at a distance greater than 100 feet from the power tools or equipment (Riverside County, California Code § 9.52.060(B), Special Sound Sources Standards).

County of San Bernardino. The County of San Bernardino's Code establishes noise-level limits. The County Code defines noise-sensitive land uses, including residential uses, professional services, and other commercial/industrial uses. The County Code states that residential land uses shall not create, or be subjected to noise levels greater than 55 dBA L_{eq} between 7:00 a.m. and 10:00 p.m., and 45 dBA L_{eq} between 10:00 p.m. and 7:00 a.m. Any source that exceeds the standards for a period of 30 minutes or more shall be in violation.

Exempt noise and vibration sources include temporary construction, repair, or demolition activities that shall occur between 7:00 a.m. and 7:00 p.m. except on Sundays and Federal holidays (San Bernardino County, California Code § 83.01.080, Noise).

Morongo Reservation. The Proposed Project will traverse approximately 8 miles of the tribal trust lands of the Morongo Indian Reservation east of Banning, California. Except for approximately two miles of new corridor between Malki Road and the western boundary of the Reservation, the Proposed Project will utilize the transmission corridor that has been used by existing SCE 220kV transmission lines starting in 1945, and as subsequently expanded. Matters concerning the use of the Reservation's trust lands are subject to approval by the Morongo Band's General Membership, which consists of all enrolled adult voting members. With limited exceptions, the Morongo Band does not release its internal ordinances and other laws to the public.

The Morongo Band's General Membership has voted to approve the Bureau of Indian Affairs' grants to SCE of the rights of way and easements necessary for SCE to continue operating its existing 220 kV facilities on the Morongo Reservation and to replace and upgrade those facilities with the WOD Project. The Morongo Band's approval of these grants of rights of way and easements includes relocating approximately two miles of the corridor west of Malki Road into a new corridor depicted on Figure 2-3, Proposed and Alternative Transmission Line Routes as either the Proposed Project (Alternative 1) or the Alternative Project (1X). The existing corridor, plus either Alternative 1 or 1X, thus would be consistent with all applicable tribal laws, and are the only corridors approved by the Morongo Band for the continued operation and eventual replacement of SCE's 220kV facilities on and across the trust lands of the Morongo Indian Reservation.

Although the Morongo Indian Reservation is located within the County of Riverside, Morongo is not subject to County noise regulations. For this analysis, the potential

impacts within the Reservation will be compared to the County's standards for information purposes only.

Summary of Local Noise Regulations. A summary of local noise regulations related to construction activities is shown in Table 4.12-7, Summary of Local Noise Regulations – Construction-Related Limits, and a summary of local noise regulations related to operation activities is shown in Table 4.12-8, Summary of Local Noise Regulations – Operation-Related Limits.

Table 4.12-7: Summary of Local Noise Regulations – Construction-Related Limits

Jurisdiction	Construction Time Limits	Construction Noise Limits
City of Banning	Between 7:00 a.m. and 6:00 p.m. Monday through Sunday	55 dBA for an interval of more than 15 minutes when measured in the interior of the nearest occupied school or residence[1]
City of Beaumont	Between 6:00 a.m. and 8:00 p.m. Monday through Sunday	No noise level requirements during construction hours
City of Calimesa	Between 7:00 a.m. and 7:00 p.m. Monday through Friday Between 10:00 a.m. and 5:00 p.m. Saturday, Sunday, and holidays	75 dBA for up to 8 hours during any 24-hour period. 78 dBA for up to 4 hours during any 24-hour period. 81 dBA for up to 2 hours during any 24-hour period. 84 dBA for up to 1 hour during any 24-hour period. 87 dBA for up to 30 minutes during any 24-hour period. 90 dBA for up to 15-minutes during any 24-hour period.
City of Colton	None; see County of San Bernardino	No noise level requirements during construction hours
City of Grand Terrace	Between 7:00 a.m. and 8:00 p.m. Monday through Saturday	No noise level requirements during construction hours
City of Loma Linda	Between 7:00 a.m. and 10:00 p.m. Monday through Sunday	No noise level requirements during construction hours
City of Palm Springs	Between 7:00 a.m. and 7:00 p.m., Monday through Friday; and 8:00 a.m. to 5:00 p.m. on Saturday	No noise level requirements during construction hours
City of Redlands	Between 7:00 a.m. and 6:00 p.m. Monday through Saturday	No noise level requirements during construction hours
City of San Bernardino	Between 7:00 a.m. and 8:00 p.m. Monday through Sunday	No noise level requirements during construction hours
City of Yucaipa	Between 7:00 a.m. and 7:00 p.m. Monday through Saturday	No noise level requirements during construction hours

Table 4.12-7: Summary of Local Noise Regulations – Construction-Related Limits

Jurisdiction	Construction Time Limits	Construction Noise Limits
County of Riverside	Between 6:00 a.m. and 6:00 p.m. (June through September) Between 7:00 a.m. and 6:00 p.m. (October through May)	No noise level requirements during construction hours
County of San Bernardino	Between 7:00 a.m. and 7:00 p.m. Monday through Saturday	No noise level requirements during construction hours
Morongo Reservation	See County of Riverside	No noise level requirements during construction hours

dBA = A-weighted decibels

[1] An 85 dBA L_{max} exterior noise standard was used for analysis purposes. This maximum noise level was derived by adding 20 dBA (representing typical building attenuation) to the published 55 dBA L_{25} interior noise standard and a 10 dBA increase to convert the L_{25} to a maximum noise level standard.

Table 4.12-8: Summary of Local Noise Regulations – Operation-Related Limits

Jurisdiction	Time of Day	Exterior Noise Level Limit
City of Banning	Between 7:00 a.m. and 10:00 p.m.	60 dBA 15-minute L_{eq} (Residential)
	Between 10:00 p.m. and 7:00 a.m.	50 dBA 15-minute L_{eq} (Residential)
	Anytime	75 dBA L_{max} (Industrial or Commercial)
City of Beaumont	See County of Riverside	See County of Riverside
	See County of Riverside	See County of Riverside
City of Calimesa	Between 7:00 a.m. and 10:00 p.m.	50 dBA L_{eq} (Residential – Density of 5 dwelling units or less per acre)
		50 dBA L_{eq} (Residential – Density of 6 or more dwelling units per acre)
	Between 7:00 p.m. and 10:00 p.m.	50 dBA L_{eq} (Residential – Density of 6 or more dwelling units per acre))
	Between 10:00 p.m. and 7:00 a.m.	40 dBA L_{eq} (Residential – Density of 5 dwelling units or less per acre)
		45 dBA L_{eq} (Residential – Density of 6 or more dwelling units per acre))
City of Colton	Anytime	65 dBA L_{eq}
City of Grand Terrace	See County of San Bernardino	See County of San Bernardino
City of Loma Linda	See County of San Bernardino	See County of San Bernardino
City of Palm Springs	Between 7:00 a.m. and 6:00 p.m.	50 dBA L_{eq} – Low Density Residential
		60 dBA L_{eq} – High Density Residential
		60 dBA L_{eq} – Commercial
		70 dBA L_{eq} – Industrial
	Between 6:00 p.m. and 10:00 p.m.	45 dBA L_{eq} – Low Density Residential
		55 dBA L_{eq} – High Density Residential
		55 dBA L_{eq} – Commercial

Table 4.12-8: Summary of Local Noise Regulations – Operation-Related Limits

Jurisdiction	Time of Day	Exterior Noise Level Limit
		60 dBA L_{eq} – Industrial
	Between 10:00 p.m. and 7:00 a.m.	44 dBA L_{eq} – Low Density Residential
		50 dBA L_{eq} – High Density Residential
		50 dBA L_{eq} – Commercial
		55 dBA L_{eq} – Industrial
City of Redlands	Between 7:00 a.m. and 10:00 p.m.	60 dBA 30-minute L_{eq} – Residential, public space, and institutional
		65 dBA 30-minute – Commercial
	Between 10:00 p.m. and 7:00 a.m.	50 dBA 30-minute L_{eq} – Residential, public space, and institutional
		60 dBA 30-minute – Commercial
	Anytime	75 dBA – Industrial
City of San Bernardino	See County of San Bernardino	See County of San Bernardino
City of Yucaipa	Between 7:00 a.m. and 10:00 p.m.	55 dBA 30-minute L_{eq} – Residential
	Between 10:00 p.m. and 7:00 a.m.	45 dBA 30-minute L_{eq} – Residential
	Anytime	55 dBA – Profession Services
	Anytime	60 dBA – Other Commercial
	Anytime	70 dBA - Industrial
County of Riverside	Between 7:00 a.m. and 10:00 p.m.	55 dBA L_{eq}
	Between 10:00 p.m. and 7:00 a.m.	45 dBA L_{eq}
County of San Bernardino	Between 7:00 a.m. and 10:00 p.m.	55 dBA 30-minute L_{eq}
	Between 10:00 p.m. and 7:00 a.m.	45 dBA 30-minute L_{eq}
Morongo Reservation	See County of Riverside	See County of Riverside

dBA = A-weighted decibels L_{eq} = Equivalent continuous sound level
L_{max} = Maximum instantaneous noise level

4.12.3 Significance Criteria

4.12.3.1 CEQA Significance Criteria

The significance criteria for assessing the impacts to noise levels come from the CEQA Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impact if it 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 groundborne vibration or groundborne 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, would the project expose people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

4.12.3.2 NEPA Analysis

Unlike CEQA, NEPA does not have specific significance criteria related to noise. However, NEPA regulations contain guidance regarding significance analysis. Specifically, consideration of "significance" involves an analysis of both context and intensity (Title 40 Code of Federal Regulations 1508.27).

4.12.4 Impact Analysis

4.12.4.1 CEQA Impact Analysis

Would the project result in the 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?

Construction Impacts

Two types of short-term noise impacts would occur during Proposed Project construction. The first type would be from construction crew commutes and the transport of construction equipment and materials to the Proposed Project site and would incrementally raise noise levels on roads leading to the site. The pieces of heavy equipment for grading and construction activities would be moved on site, remain for the duration of construction, and would not add to the daily traffic volume in the Proposed Project vicinity. A high single-event noise exposure potential at a maximum level of 87 dBA L_{max} from trucks passing at 50 feet may occur. However, the projected construction traffic would be minimal when compared to existing traffic volumes on I-215 and I-10 and would produce an increase of less than 1 dBA when compared with the long-term noise level. Construction traffic would be low compared to existing volumes on other affected streets and would produce traffic noise levels less than 65 dBA CNEL. Therefore, short-term construction-related worker commutes and equipment transport noise impacts would be less than significant.

The second type of short-term noise impact is related to noise generated during the Proposed Project construction. The construction is conducted in discrete steps, each of

which has its own mix of equipment and consequently its own noise characteristics. These various sequential steps would change the character of the noise generated and the noise levels along the Proposed Project corridor as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of equipment operation allow construction-related noise ranges to be categorized by work phase. Table 4.12-5, Typical Maximum Construction Equipment Noise Levels (L_{max}), lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor.

The A-weighted maximum instantaneous sound level (dBA L_{max}) and the A-weighted equivalent continuous sound level (dBA L_{eq}) for construction noise were estimated for the Proposed Project using detailed equipment inventory and Proposed Project construction scheduling information provided by the Proposed Project applicant combined with the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM).

The construction of the Proposed Project would consist of substation modifications, installation and removal of 220 kV transmission lines, 66 kV subtransmission lines, 12 kV distribution lines, telecommunications facilities, and the establishment of staging yards. Below is a brief description of the construction work for each component mentioned above and the potential construction noise impact.

For specific types of construction work, helicopters would be used. Due to the duration of use, noise impacts associated with the worst-case hovering period of helicopter operation, which is much less than one hour, are analyzed separately from the impacts associated with construction at typical locations within the Project Study Area that are assumed to occur for more than one hour. If helicopter activities were to occur in close proximity to the ground surface, other noise-generating activities such as grading and ground preparation would not likely take place at the same location. Given the distance between each tower (from 75 to 3,400 feet), it is not expected that the nearest receptor at each location would experience any cumulative noise impacts due to construction activities at another location. Each component analyzed below is considered a worst-case condition for the nearby noise sensitive receptors.

Substation Modifications. There are no new substations proposed as part of the Proposed Project. Modifications to existing substation equipment would be made to accommodate continuous and emergency power on the WOD 220 kilovolt (kV) transmission lines between Vista, San Bernardino, El Casco, and Devers substations. Additionally, Timoteo and Tennessee substations would also be modified to accommodate the 66 kV subtransmission line relocations. All substation-related work would be conducted within the existing substation walls or fence lines. The Proposed Project would not result in changes to access, parking, drainage patterns, or modifications to perimeter walls or fencing at the existing substations.

The grading and surface improvements of the existing substations would generate the highest noise levels (compared to other construction activities) because, typically, earthmoving equipment is the noisiest construction equipment. Table 4.12-9, Substation

Construction Noise Levels, lists the maximum instantaneous sound level and equivalent continuous sound level for the closest noise-sensitive land use at each of the existing substations. As shown in Table 4.12-9, Substation Construction Noise Levels, noise levels at the closest sensitive land use within the City of Calimesa would not exceed its construction noise limits of 75 dBA for up to 8 hours during any 24-hour period, 78 dBA for up to 4 hours during any 24-hour period, 81 dBA for up to 2 hours during any 24-hour period, 84 dBA for up to 1 hour during any 24-hour period, 87 dBA for up to 30 minutes during any 24-hour period, or 90 dBA for up to 15 minutes during any 24-hour period for construction activities at El Casco Substation. Residences in the City of Calimesa would not be exposed to construction-related noise that exceeds its adopted thresholds. Therefore, construction noise impacts would be less than significant.

Table 4.12-9: Substation Construction Noise Levels

Substation	Distance to Closest Sensitive Land Use (feet)	dBA L_{max}	dBA L_{eq}	City/County	Threshold	Exceed Threshold?
Devers	1,000	58.4	50.3	County of Riverside	None	No
El Casco	950	55.1	49.5	City of Calimesa[1]	75 dBA, 8 hr. L_{eq}[2] 78 dBA, 4 hr. L_{eq}[2] 81 dBA, 2 hr. L_{eq}[2] 84 dBA, 1 hr. L_{eq}[2] 87 dBA, L_{50}[2] 90 dBA, L_{25}[2]	No
Vista	50	84.4	83.3	City of Grand Terrace	None	No
San Bernardino	875	59.5	52.3	City of Redlands	None	No
Etiwanda	3,500	75.0	71.0	City of Rancho Cucamonga	None	No
Timoteo	50	77.6	77.3	City of Loma Linda	None	No
Tennessee	50	77.6	77.3	City of Yucaipa	None	No

Source: LSA Associates, Inc. June 2013.

[1] Although the El Casco Substation is located in the County of Riverside, the closest receptor resides in the City of Calimesa and construction activities should comply with the City of Calimesa's noise ordinance.

[2] City of Calimesa limits construction noise to 75 dBA for up to 8 hours during any 24-hour period, 78 dBA for up to 4 hours during any 24-hour period, 81 dBA for up to 2 hours during any 24-hour period, 84 dBA for up to 1 hour during any 24-hour period, 87 dBA for up to 30 minutes during any 24-hour period, and 90 dBA for up to 15 minutes during any 24-period.

dBA = A-weighted decibel L_{eq} = equivalent continuous noise level L_{max} = Maximum instantaneous noise levels

L_{25} = A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 25% of a stated time period.

The Proposed Project's construction activities would typically occur during the time periods allowed by the local jurisdiction's municipal code or, if needed, as otherwise agreed to by the relevant jurisdiction. Therefore, construction noise generated by the Proposed Project would result in less than significant impacts related to the exposure of

persons to or generation of noise levels in excess of standards established in the local general plan, local noise ordinance, or applicable standards of other agencies.

220 kV Transmission Lines and 66 kV Subtransmission Lines. The Proposed Project would include the removal and upgrade of approximately 181 circuit miles of existing 220 kV line facilities (approximately 48 corridor miles) primarily within the existing WOD corridor. The Proposed Project would primarily be constructed on a combination of new 220 kV double-circuit lattice steel towers (LSTs), double-circuit tubular steel poles (TSPs), and single-phase TSPs. Each of the proposed 220 kV transmission lines would consist of overhead wires (conductors).

Access and spur roads would be used to access the planned removal and construction areas. SCE's existing access roads are located within SCE ROW/easements. New and/or expanded property rights may be required to construct new access/spur roads.

Temporary wood and/or steel structures would be used to facilitate construction of the new 220 kV transmission lines and would function as guard structures and/or shoo-fly structures. These temporary structures would be direct-buried and/or guyed and removed following completion of construction at the particular location.

The Proposed Project would require relocation of portions of the existing San Bernardino-Redlands-Timoteo (approximately 2 miles) and the San Bernardino-Redlands-Tennessee 66 kV (approximately 3.5 miles) subtransmission lines located within Segment 1 to new routes within existing ROW or franchise,[3] or newly acquired ROW. The relocated 66 kV subtransmission lines would be constructed within new ROW or existing franchise.

A shoo-fly is a temporary electrical line on temporary poles that is used during construction to maintain electrical service to the area while allowing portions of a permanent line to be taken out of service, ensuring safe working conditions during construction activities. The shoo-fly facilities would be removed after construction is completed. A variety of shoo-fly facilities would need to be installed in order to accommodate the installation of the new 220 kV structures within the existing WOD corridor. Shoo-fly structures could consist of steel and/or wood poles that may be guyed for stability. These structures would range in height from approximately 40 to 145 feet above ground.

Other than helicopter activities, which generate the highest noise levels, the roads and site preparation tasks for the transmission, subtransmission, and shoo-fly lines would generate the highest noise levels (compared to other construction activities) because the noisiest construction equipment is earthmoving equipment (a grader, a dozer, and a compactor are anticipated). Though more than these three pieces of equipment may be used during the construction of the roads and site preparation activity, a conservative approach was used in the analysis, assuming concurrent operation of the three loudest pieces of equipment during this construction activity.

[3] The term "franchise" refers to utility infrastructure ROW agreements that SCE holds with local jurisdictions.

A combined maximum (L_{max}) and average hourly level (L_{eq}) for the grader, dozer, and compactor was calculated using the FHWA RCNM. The FHWA RCNM takes into account a reference maximum noise level, usage factor percentage, distance to receptor, and ground effect to sum up the noise level impacts estimated to be experienced by the receptor. For the purposes of analysis, it is not anticipated that the simultaneous use of construction equipment would occur for more than 6.5 to 7 hours per day, taking into account tailboard meetings, environmental sweeps, lunch, and refueling throughout the day. The reference maximum noise level for a grader is 85.0 dBA L_{max} at a distance of 50 feet, 83.2 dBA L_{max} at a distance of 50 feet for a compactor, and 81.7 dBA L_{max} at a distance of 50 feet for a dozer. The L_{eq} and L_{max} for the closest noise-sensitive land use within the cities of Banning and Calimesa were specifically calculated because these jurisdictions have specific noise level standards for construction noise established in each city's municipal code. None of the other jurisdictions within the Project Study Area has specific construction noise level standards. Construction noise for the cities of Banning and Calimesa was characterized by calculating an expected construction noise level impact at 50 feet from the center of activity. A combined level of 83.6 dBA L_{eq} at 50 feet and 85.0 dBA L_{max} at 50 feet was calculated for this combination of construction equipment. Those levels were then projected to the nearest sensitive receptor locations in the cities of Banning and Calimesa. Noise levels associated with construction activities are expected to reach 79.8 dBA L_{eq} and 81.2 dBA L_{max} in the City of Banning and 80.3 dBA L_{eq} and 81.7 dBA L_{max} in the City of Calimesa at these nearest sensitive receptor locations.

As shown in Table 4.12-10, 220 kV Transmission Line and 66 kV Subtransmission Line Construction Noise Levels, construction noise levels associated with transmission line construction activities would not exceed the City of Banning's interior noise level of 55 dBA for an interval of more than 15 minutes. An exterior maximum noise level standard of 85 dBA L_{max} was derived based on a building attenuation of 20 dBA and an increase of 10 dBA to convert the L_{25} noise level to maximum noise level. However, construction noise levels could exceed the City of Calimesa's 4-hour standard of 78 dBA L_{eq} at the noise-sensitive residential uses adjacent to the existing WOD corridor, if the operation of the combined construction equipment would last for more than 4 hours per day. The Proposed Project's construction activities are of short duration and would typically occur during the time periods allowed by the local jurisdiction's municipal code or, if needed, as otherwise agreed to by the relevant jurisdiction. During construction activities, the following common operating procedures may be utilized to further reduce noise levels. Standard procedures may include, but are not limited to, confining activities to typical daytime hours, utilization of equipment to reduce noise (e.g., mufflers and engine shrouds) that are no less effective than those originally installed, traffic being routed away from residences and schools where practicable, and the minimization of unnecessary idling time of the construction equipment. Furthermore, the Proposed Project would comply with local noise ordinances to the extent practicable. However, there may be a need to deviate from local noise standards (in the City of Calimesa). In those instances, SCE would coordinate with the City of Calimesa to minimize any conflicts with the established local noise standards. As a result, the potential short-term construction noise impacts would be less than significant.

Table 4.12-10: 220 kV Transmission Line and 66 kV Subtransmission Line Construction Noise Levels[1]

City/County	Distance to Closest Sensitive Land Use (feet)	dBA L_{max}	dBA L_{eq}	Threshold	Exceed?
City of Banning	77	81.2	79.8	85 dBA L_{max}[2]	No
City of Calimesa	73	81.7	80.3	75 dBA, 8 hr L_{eq}[3] 78 dBA, 4 hr L_{eq}[3] 81 dBA, 2 hr L_{eq}[3] 84 dBA, 1 hr L_{eq}[3] 87 dBA, L_{50}[3] 90 dBA, - L_{25}[3]	Yes[4]
All other jurisdictions in the Study Area	50[4]	85.0	83.6	None	No

Source: LSA Associates, Inc. June 2013.

[1] Subtransmission lines are only located within Segment 1, cities of Loma Linda and Redlands.

[2] A maximum noise level standard was derived by adding 20 dBA (representing typical building attenuation) to the published 55 dBA L_{25} interior noise standard and a 10 dBA increase to convert the L_{25} standard to a maximum noise level standard.

[3] City of Calimesa limits construction noise to 75 dBA for up to 8 hours during any 24-hour period, 78 dBA for up to 4 hours during any 24-hour period, 81 dBA for up to 2 hours during any 24-hour period, 84 dBA for up to 1 hour during any 24-hour period, 87 dBA for up to 30 minutes during any 24-hour period, or 90 dBA for up to 15 minutes during any 24-hour period.

[4] The City of Calimesa's 4-hour noise standard of 78 dBA L_{eq} would be exceeded at any distance less than 95 feet from the edge of construction activity.

[5] A reference distance of 50 feet was used for all jurisdictions without a published noise threshold for information purposes.

dBA = A-weighted decibel hr = hour/hours kV = kilovolt
L_{25} = A-weighted noise levels equaled or exceeded by a fluctuating sound level 25 percent of a stated time period
L_{eq} = Equivalent continuous noise level L_{max} = Maximum A-weighted noise levels.

Telecommunications. The new telecommunications infrastructure would include additions and modifications to the existing telecommunications system in order to maintain telecommunications operations during and after construction of the Proposed Project. The telecommunications infrastructure would be constructed in new and existing underground conduit and cable trench, and on existing riser, distribution, and subtransmission poles. Additionally, removal of the fiber optic line portions from the 220 kV existing structures to connections in the field and/or at existing substations would be required.

The three loudest pieces of equipment that would be used regularly during the telecommunications line installation phase are a bucket truck, crew truck, and backhoe. A conservative approach was used in the analysis, assuming concurrent operation of the three loudest pieces of equipment during this construction activity.

A combined maximum (L_{max}) and average hourly level (L_{eq}) for the bucket truck, crew truck, and backhoe was calculated using the FHWA RCNM. The reference maximum noise level at a distance of 50 feet for a bucket truck is 74.7 dBA L_{max}, 75.0 dBA L_{max} for a crew pick-up truck, and 77.6 dBA L_{max} for a backhoe. The L_{eq} and L_{max} for the closest noise-sensitive land use within the cities of Banning and Calimesa were specifically calculated due to the noise level standards for construction noise within each city's municipal code. For all other jurisdictions within the Project Study Area, none of which

has specific construction noise level standards, an expected construction noise level impact at 50 feet from the center of activity was reported. A combined level 76.8 dBA L_{eq} at 50 feet and 77.6 dBA L_{max} at 50 feet was calculated for this combination of construction equipment. Those levels were then projected to the nearest receptor in the cities of Banning and Calimesa. Noise levels associated with construction activities are expected to reach 73.0 dBA L_{eq} and 73.8 dBA L_{max} in Banning and 73.5 dBA L_{eq} and 74.3 dBA L_{max} in Calimesa.

As shown in Table 4.12-11, Telecommunications Line Construction Noise Levels, construction noise level impacts associated with installation of telecommunication lines would not exceed the City of Banning L_{max} standard or the City of Calimesa's L_{eq} and L_{max} noise level standards, thus creating no significant construction noise level impact. Also, no significant construction noise impacts would occur at the closest residences in other jurisdictions within the Project Study Area because the Proposed Project construction activity would comply with local noise regulations, including hours of construction, or as otherwise in coordination with the relevant jurisdiction, if needed. Therefore, impacts would be less than significant.

Table 4.12-11: Telecommunications Line Construction Noise Levels

City/County	Distance to Closest Sensitive Land Use (feet)	dBA L_{max}	dBA L_{eq}	Threshold	Exceed?
City of Banning	77	73.8	73.0	85 dBA L_{max}[1]	No
City of Calimesa	73	74.3	73.5	75 dBA, 8 hr L_{eq}[2] 78 dBA, 4 hr L_{eq}[2] 81 dBA, 2 hr L_{eq}[2] 84 dBA, 1 hr L_{eq}[2] 87 dBA, L_{50}[2] 90 dBA, - L_{25}[2]	No
All other jurisdictions in the Study Area	50[3]	77.6	76.8	None	No

Source: LSA Associates, Inc. June 2013.

[1] A maximum noise level standard was derived by adding 20 dBA (representing typical building attenuation) to the published 55 dBA L_{25} interior noise standard and a 10 dBA increase to convert the L_{25} standard to a maximum noise level standard.

[2] The City of Calimesa limits construction noise to 75 dBA for up to 8 hours during any 24-hour period, 78 dBA for up to 4 hours during any 24-hour period, 81 dBA for up to 2 hours during any 24-hour period, 84 dBA for up to 1 hour during any 24-hour period, 87 dBA for up to 30 minutes during any 24-hour period, or 90 dBA for up to 15 minutes during any 24-hour period.

[3] A reference distance of 50 feet was used for all jurisdictions without a published noise threshold for information purposes.

dBA = A-weighted decibel hr = hour/hours

L_{25} = A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 25% of a stated time period

L_{eq} = Equivalent continuous noise level

L_{max} = Maximum A-weighted noise levels that are measured during a designated time interval

Staging Yards. SCE anticipates using one or more of the possible temporary staging yards listed in Table 3.2-A, Potential Staging Yard Locations, and seen in Figure 3.2-1, Potential Staging Yard Locations, as a reporting location for workers, vehicle, and equipment parking, material storage, and a location from which helicopters may be used to perform construction activities. Typically, each yard would be 3 to 20 acres in size,

depending on land availability and needs at that location. Preparation of the staging yard would include temporary perimeter fencing and, depending on existing ground conditions at the site, may include the use of gravel or crushed rock over the ground surface.

Noise generated within the staging yards would be associated with erecting temporary perimeter fencing, use of gravel or crushed rock, activities of workers, vehicle and equipment parking, and material delivery and storage. The highest noise level generated from construction staging activities would be from truck parking activities or truck deliveries. Assuming two trucks operating at each staging area for a short period of time (one hour or less) associated with parking activities, or truck deliveries, the maximum noise level would be 75.0 dBA L_{max} at a distance of 50 feet while the average hourly level would be 65.0 dBA L_{eq} at a distance of 50 feet. Table 4.12-12, Staging Yard Construction Noise Levels, lists the maximum noise level and average hourly level for the closest sensitive land use and shows that noise levels generated from staging yard activities would not exceed any local jurisdiction's noise standard shown in Table 4.12-7, Summary of Local Noise Regulations – Construction-Related Limits. The Proposed Project's construction staging yard activities would typically occur during the time periods allowed by the local jurisdiction's municipal code or as otherwise agreed to by the relevant jurisdiction, if needed. Therefore, construction noise generated by the Proposed Project would result in less than significant impacts related to the exposure of persons to or generation of noise levels in excess of standards established in the local general plan, local noise ordinance, or applicable standards of other agencies.

Table 4.12-12: Staging Yard Construction Noise Levels

Staging Yard	City/ County	Distance to Closest Sensitive Land Use (feet)	dBA L_{max}	dBA L_{eq}	Threshold	Exceed?
Beaumont No. 1 Material and Equipment Staging Area	City of Beaumont	374	57.5	47.5	None	No
Beaumont No. 2 Material and Equipment Staging Area	City of Beaumont	253	60.9	50.9	None	No
Devers Material and Equipment Staging Area	County of Riverside	2,000	25.5	15.5	None	No
Grand Terrace Material and Equipment Staging Area	City of Grand Terrace	320	58.9	48.9	None	No
Hathaway No. 1 Material and Equipment Staging Area	City of Banning	52	74.7/54.7[1]	64.7	85 dBA L_{max}[1]	No

Table 4.12-12: Staging Yard Construction Noise Levels

Staging Yard	City/ County	Distance to Closest Sensitive Land Use (feet)	dBA L_{max}	dBA L_{eq}	Threshold	Exceed?
Hathaway No. 2 Material and Equipment Staging Area	City of Banning	54	74.3/54.3[1]	64.3	85 dBA L_{max}[1]	No
Lugonia Material and Equipment Staging Area	City of Redlands	1,094	48.2	38.2	None	No
Mountain View No. 1 Material and Equipment Staging Area	City of San Bernardino	14	86.1	76.1	None	No
Poultry Material and Equipment Staging Area	County of Riverside	52	74.7	64.7	None	No
San Timoteo Material and Equipment Staging Area	County of Riverside	11	88.2	78.2	None	No

Source: LSA Associates, Inc., June 2013.

[1] The construction noise standard for the City of Banning is 55 dBA for an interval of 15 minutes for an interval of more than 15 minutes per hour. For analysis purposes, a maximum noise level standard was derived by adding 20 dBA (representing typical building attenuation) to the published 55 dBA L_{25} interior noise standard and a 10 dBA increase to convert the L_{25} standard to a maximum noise level standard.

dB = decibel dBA= A-weighted decibel

L_{eq} = equivalent continuous noise level

L_{max} = maximum A-weighted noise levels that are measured during a designated time interval

Helicopter Activities. Project-related helicopter activities for the construction of the transmission lines could include delivery of equipment and materials from staging yards to structure sites, structure placement, hardware installation, and conductor and/or optical ground wire (OPGW) stringing operations. The specific helicopter models assumed to be used include the Bell 500 (MD 500) and Kaman Kmax. The reference noise level for the Bell 500 was taken from a letter provided by Bell Helicopter Textron on April 26, 2001. The reference noise level for hovering is 95.9 dBA at 100 feet. The reference noise level for the Kaman Kmax was taken from an April 2007 study prepared by the U.S. Forest Service titled, "Sound Measurements of Helicopter During Hovering Operations." The reference noise level for hovering is 84.0 dBA at 250 feet. The total time within any given hour of the day that the helicopter will be used at one location is approximately 15 minutes. Helicopters may travel back and forth for multiple times within that hour at a given tower site location. The helicopters may travel back and forth between sites and staging yards multiple times within that hour. Depending upon the specific needs, project-related helicopter activities for the construction of the transmission lines could occur across the entire project area. Prior to the start of construction, SCE and the selected contractor would create a detailed Project Specific Helicopter Use Plan describing all planned usage of helicopters or other aircraft in the performance of this

work. The Project Specific Helicopter Use Plan will be reviewed by SCE to ensure FAA regulations/guidance and/or industry best management practices are met. It would also include flight routes and altitudes in order to minimize flight into sensitive areas and to avoid aircraft congestion. The operations area of the helicopters would be limited to the Proposed Project area, including staging areas, ground locations in close proximity to conductor and/or OPGW pulling, tensioning, and splice sites, including locations in previously disturbed areas near construction sites. In addition, helicopters must be able to land within SCE ROWs, which could include landing on access or spur roads. All helicopter refueling in the staging areas, ROWs or access or spur roads, would be in accordance with the SWPPP. It is also assumed that at night or during off days, for safety and security concerns, helicopters and their associated support vehicles and equipment may be based at a local airport.

The nearest receptors in Banning are approximately 55 feet from the nearest new structure and the nearest receptor in Calimesa is approximately 75 feet away. Receptors are located at or along the edges of the existing WOD corridor, and for purposes of the environmental analysis it was assumed that the nearest horizontal distance from a receptor would be 50 feet from the nearest new structure and 250 feet vertical distance. The assumed vertical distance reflects a 150-foot leash lowering people and equipment to the top of a 100-foot pole. Given a 150-foot leash and a 100-foot high pole, the helicopter would hover at a vertical distance of 250 feet. The vertical and horizontal distances were then used to obtain the actual distance between the helicopter and receptor.

Noise impacts associated with helicopter activities during construction were calculated based on the assumptions included above. Potential noise impacts in the City of Banning are expected to range from 83.8 dBA L_{25} to 87.7 dBA L_{25} and potential noise impacts in the City of Calimesa are expected to range from 83.6 dBA L_{25} to 87.6 dBA L_{25}. For all other jurisdictions in the Project Study Area, potential noise impacts are expected to range from 84.0 dBA L_{25} to 87.9 dBA L_{25}. The metrics used are based on the operational characteristic of helicopters (continuously constant while hovering) for 15 minutes (i.e., one-quarter of an hour) within any given hour of the day.

Noise impacts in the City of Calimesa are expected to remain below the established 15-minute noise level standard. Noise impacts in the City of Banning may exceed the noise level standards; however, due to the short-term duration of these activities, helicopter use would result in a less than significant impact for noise-sensitive uses in the City of Banning. No significant construction noise impacts would occur at the closest residences in other jurisdictions within the Project Study Area because construction activities would typically occur during the time periods allowed by the local jurisdiction's municipal code. There may be limited situations where time-sensitive work would need to occur outside of established time periods. SCE would consult with relevant jurisdictions in these limited instances to minimize impacts. Due to the limited number of helicopter events and the short-term duration of these activities, helicopter use would result in a less than significant impact.

Summary. Due to the nature of construction activities, short-term duration helicopter activities were analyzed separately from typical worst-case scenario activities such as

grading and ground preparation. It is anticipated that helicopter activities would not occur concurrently with other construction activities. Also, due to the distance between each tower or project component location, it is not expected that a single receptor would experience noise impacts from construction activity at multiple tower locations.

As stated in Table 4.12-10: 220 kV Transmission Line and 66 kV Subtransmission Line Construction Noise Levels, the cities of Banning and Calimesa are addressed separately from other jurisdictions because these cities have specific noise level standards for construction noise established in each city's municipal code. None of the other jurisdictions within the Project Study Area has specific noise level thresholds. Construction activity associated with the Proposed Project would result in the generation of noise that would exceed the threshold in the City of Calimesa. The Proposed Project would comply with local noise ordinances to the extent practicable. However, there may be a need to deviate from local noise standards (City of Calimesa). In those instances, SCE would voluntarily coordinate with the City of Calimesa to minimize any conflicts with the established local noise standards. As a result, the potential short-term construction noise impacts would be less than significant. Additionally, construction noise impacts in other jurisdictions would be less than significant.

Furthermore, with the limited number of helicopter events and the short-term duration of these activities, helicopter use would result in a less than significant impact for the City of Banning. As a result, the potential short-term construction noise impacts would be less than significant.

Operation Impacts

Normal operation of the lines would be controlled remotely through SCE control systems, and manually in the field as required. SCE inspects the transmission, subtransmission, telecommunications, and distribution overhead facilities in a manner consistent with CPUC General Order 165, at a minimum of once per year via ground and/or aerial observation. Maintenance would occur as needed and could include activities such as repairing conductors, washing or replacing insulators, repairing or replacing other hardware components, replacing poles and structures, tree trimming, brush and weed control, and access road maintenance. Most regular operations and maintenance (O&M) activities of overhead facilities are performed from existing access roads with no surface disturbance. Repairs to existing facilities, such as repairing or replacing existing poles and structures, could occur in undisturbed areas. Operation noise assumptions include the occasional maintenance activity that would typically require the use of one helicopter operating for two hours and five trucks traversing the length of the transmission line.

The potential operation noise impacts from the Proposed Project are associated with the operation of the substation modifications and the transmission and subtransmission lines. The operation of the telecommunications lines does not generate noticeable noise, and the staging yards would not continue to be operational after Proposed Project construction is complete.

Substation Modifications. The Proposed Project would not replace or install any new noise-generating components within the substations. Operations and maintenance activities at the substations and along the subtransmission infrastructure would be conducted using light- and medium-duty vehicles, and would be similar in nature and frequency to O&M activities that currently occur. Therefore, the existing operational noise levels at the substations are not expected to change or increase. The operation of the substation modifications is not expected to generate noise levels that would exceed the standards established by the local jurisdictions and as listed in Table 4.12-8, Summary of Local Noise Regulations – Operation-Related Limits. Impacts would be less than significant.

220 kV Transmission Lines and 66 kV Subtransmission Lines. Operations of the transmission lines would be controlled remotely. Noise generated from the operations of the 220 kV transmissions line and 66 kV subtransmission lines are known as corona noise. The EPRI has conducted several studies of corona effects (EPRI 1979 and 1987). The typical noise levels for transmission lines with wet conductors are shown in Table 4.12-6, Transmission and Subtransmission Line Voltage and Audible Noise Levels, which shows the audible noise associated with transmission and subtransmission lines decreases as the line voltage decreases; the audible noise associated with the Proposed Project's 220 kV transmission lines and 66 kV subtransmission lines would be less than 40.4 dBA and 33.5 dBA, respectively. The existing ambient noise levels range from 39.2 to 63.1 dBA L_{eq} within the Project Study Area. Noise levels generated from the 66 kV subtransmission lines would be lower than the existing ambient noise level and would not exceed the noise standard for each local jurisdiction shown in Table 4.12-8, Summary of Local Noise Regulations – Operation-Related Limits. The proposed 220 kV transmission lines are located approximately 50 feet from the closest residence. The proposed 220 kV transmission lines are assumed to be approximately 110 feet from the ground given that the LST tower height ranges between 110 to 184 feet. At approximately 50 feet from the 220 kV transmission line, the closest residence would be subject to a corona noise level of 39.8 dBA. Although this level is slightly higher than the ambient noise level in certain locations within the Project Study Area, it would not exceed the noise standard of each local jurisdiction shown in Table 4.12-8, Summary of Local Noise Regulations – Operation Related Limits. The operation of the Proposed Project transmission and subtransmission lines is not expected to generate noise levels that would exceed the standards established by the local jurisdictions and as listed in Table 4.12-8, Summary of Local Noise Regulations – Operation-Related Limits. Impacts would be less than significant.

Other operational activities include maintenance associated with transmission lines, which would be conducted using light- to medium-duty vehicles, helicopters, and construction equipment to maintain access roads and repairing or replacing existing poles and structures. Routine inspection and maintenance activities would cause short-term or intermittent increases in noise along the Proposed Project lines. Maintenance activities would be similar in nature and frequency to current maintenance activities.

Operation and maintenance activities along the existing corridor as stated above would involve occasional helicopter and vehicle use. These activities would generate noise

along the corridor; however, due to the frequency of such maintenance activities, ambient noise levels would not be adversely affected. Furthermore, based on the type and quantity of operational equipment, these activities would not create noise levels in excess of established standards. Operational impacts would be less than significant.

Would the project result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Construction Impacts

There are no Federal, State, or local vibration regulations or guidelines applicable to the Proposed Project, except for the City of Redlands. The City of Redlands limits vibration levels that are above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property, or at 150 feet from the noise source if on a public space or public ROW. Groundborne vibration or groundborne noise level impacts from construction activities are considered significant if they cause damage to structures or cause sleep disturbance if such activities occur at night near residential areas. In addition, for the City of Redlands, groundborne vibration or groundborne noise impact from construction activities are considered significant if vibration levels are above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property, or at 150 feet from the vibration source if on a public space or public ROW.

Vibration impacts associated with construction operations would primarily affect those persons located closest to heavy construction activities. The Caltrans-published vibration levels for typical construction equipment are shown in Table 4.12-13, Vibration Source Levels for Typical Construction Equipment. A vibration level that would exceed the construction vibration damage criteria for its corresponding building type would be considered significant. The construction vibration damage criteria for the corresponding buildings types are shown in Table 4.12-14, Guideline Vibration Damage Potential Threshold Criteria. In addition, potential vibration impacts were evaluated for community annoyance based on the level of perception. Table 4.12-15, Guideline Vibration Annoyance Potential Criteria, shows the difference in levels of perceptibility. A threshold of 0.04 PPV for the perception threshold of vibration was used to determine significance for the City of Redlands.

Table 4.12-13: Vibration Source Levels for Typical Construction Equipment

Equipment	PPV at 25 feet (inches per second)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.079
Jackhammer	0.035
Small Bulldozer	0.003

Source: Caltrans Transportation and Construction-Induced Vibration Guidance Manual, June 2004.
PPV = peak particle velocity.

Table 4.12-14: Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (inches per second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5

Source: Caltrans Transportation and Construction-Induced Vibration Guidance Manual, June 2005.
PPV = peak particle velocity

Table 4.12-15: Guideline Vibration Annoyance Potential Criteria

Structure and Condition	Maximum PPV (inches per second)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans Transportation and Construction-Induced Vibration Guidance Manual, June 2005.
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.
[1] PPV = peak particle velocity

The modifications to the existing substation, transmission line removal and installation, relocation of subtransmission lines, relocation of distribution lines, telecommunications facilities installation, and construction staging yards would generate groundborne vibration. Below is a brief description of the construction work that would generate vibration levels for each component mentioned above and their potential construction vibration impact.

Substation Modifications. Construction activities that would generate the highest vibration levels at each of the existing substations would be associated with grading and surface improvements. The use of a backhoe, excavator, and truck are anticipated during this phase of construction. It is assumed that both the backhoe and excavator would generate the highest vibration levels and would generate similar vibrations levels as a small bulldozer. As shown in Table 4.12-13, Vibration Source Levels for Typical Construction Equipment, a small bulldozer would generate a vibration level of 0.003 PPV at a distance of 25 feet. The closest residences are located more than 25 feet from the Proposed Project construction areas of the existing substations. Therefore, these residences may be subject to short-term vibration levels less than 0.003 PPV generated by construction activities within the Project Study Area. This vibration level would not exceed the damage criteria of 0.3 PPV for older residential structures (Table 4.12-14, Guideline Vibration Damage Potential Threshold Criteria) or exceed the threshold of perception of 0.04 PPV. It should be noted that there are no existing substations located in the City of Redlands. As construction activities associated with modifying existing

substations would not cause damage to nearby residences or cause community annoyance, the Proposed Project would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Therefore, impacts would be less than significant.

220 kV Transmission Lines and 66 kV Subtransmission Lines. Construction activities that would generate the highest vibration level would be associated with drilling to construction concrete footings for the structures. The use of an auger truck and a dozer are anticipated during this phase of construction. It is assumed that an auger truck would generate the highest vibration level and would generate similar vibrations levels as caisson drilling. As shown in Table 4.12-13, Vibration Source Levels for Typical Construction Equipment, caisson drilling would generate a vibration level of 0.089 PPV at a distance of 25 feet from the drilling site. The closest residences are located approximately 40 feet from the Proposed Project construction area. Vibration levels generated by construction activities within the Project Study Area were calculated to be 0.04 PPV at the closest residence. This vibration level would not exceed the damage criteria of 0.3 PPV for older residential structures (Table 4.12-14, Guideline Vibration Damage Potential Threshold Criteria). However, as shown in Table 4.12-15, Guideline Vibration Annoyance Potential Criteria, this vibration level would be distinctly perceptible, but not exceed the threshold of perception of 0.04 PPV. Therefore, construction activities associated with LST or tower installation would not cause damage to nearby residential structures and would not result in community annoyance. Construction-related vibration levels would not exceed the threshold discussed above. In addition, these vibration levels are intermittent and temporary in nature and would no longer occur once construction of the Proposed Project is complete. Therefore, the Proposed Project would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Impacts would be less than significant.

Depending on final engineering and construction planning, and whether rock is encountered on site, rock blasting operations may be required for the Proposed Project. This would occur prior to grading and foundation development. In addition, implosive sleeves, which use explosives, may be used for splicing conductors together. These blasting operations, if required, would occur independently from all other adjacent construction activities, which would cease during a blasting event. Using explosives to break rock generates low frequency sound waves that can structurally damage buildings in proximity. However, techniques have been developed that allow blasting to be conducted in relative proximity to buildings without causing damage. The character of the blast and ground vibrations would be dependent on such factors as soil and rock type, amount and type of explosive used, depth below surface, and meteorological conditions. Prior to blasting, distances to any receptors in the area would be assessed to ensure that the blast would be engineered to be safe and effective. Blasting generally consists of a dull thud, rather than as a loud explosion. The blasting contractor would be required to notify residents, utilities, or others potentially affected by blasting operations in advance and limit the blasting to specific areas to prevent damage to existing structures.

Groundborne vibration levels from a blasting event diminish rapidly with distance. If rock blasting or the use of implosive sleeves is necessary, these activities would occur at a select few locations taking into consideration appropriate distances from residences and other structures. As such, the groundborne vibration impacts associated with the Proposed Project would not have significant groundborne vibration and noise impacts.

Telecommunications. Construction activities that would generate the highest vibration levels would be associated with the installation of telecommunication lines. The use of a backhoe and a truck are anticipated during this phase of construction. It is assumed that both the backhoe and a truck would generate the highest vibration levels and would generate similar vibrations levels as a small bulldozer. As shown in Table 4.12-14, Guideline Vibration Damage Potential Threshold Criteria, a small bulldozer would generate a vibration level of 0.003 PPV at a distance of 25 feet. The closest residences are located more than 25 feet from the Proposed Project construction areas of the existing substations. These residences may be subject to short-term vibration levels less than 0.003 PPV generated by construction activities within the Project Study Area. This vibration level would not exceed the damage criteria of 0.3 PPV for older residential structures or exceed the threshold of perception of 0.04 PPV. As construction activities associated with the installation of telecommunications would not cause damage to nearby residential structures or cause community annoyance, the Proposed Project would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Therefore, this impact would be less than significant.

Staging Yards. Construction activities from staging yards would be associated with erecting temporary perimeter fencing, use of gravel or crushed rock, activities of workers, vehicle and equipment parking, and material storage. Use of heavy-track construction equipment is not anticipated. Vibration levels generated from these activities would not be perceptible and would be considered negligible. As construction activities associated with staging yard activity would not cause damage to nearby residential structures or result in community annoyance, the Proposed Project would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Therefore, a less than significant impact related to this topic would result.

In summary, the construction of the Proposed Project would result in less than significant impacts associated with the generation of excessive groundborne vibration or groundborne noise levels. Similar to the construction vibration impacts analyzed above, due to the distance between each tower constructed or modified, it is not expected that the nearest receptor at each location would experience combined vibration impacts due to construction activities at another location. Each component is analyzed as a worst-case condition for the nearby sensitive receptors.

Operation Impacts

The following discussion addresses all Proposed Project components, including substation modifications, 220 kV transmission lines, 66 kV subtransmission lines, 12 kV distribution lines, and telecommunication facilities.

Operation of the Proposed Project would consist of routine maintenance activities and emergency repairs. It is unlikely that these activities would produce significant groundborne noise or vibration. There would be no change to existing vibration conditions at the substations. No other component of the Proposed Project would generate vibrations during operation. Therefore, operation of the Proposed Project would not result in the exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. The impact would be less than significant.

Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

The following discussion addresses all Proposed Project components, including substation modifications, 220 kV transmission lines, 66 kV subtransmission lines, 12 kV distribution lines, and telecommunication facilities.

Construction Impacts

Construction activities in the Project Study Area would be temporary in nature. Construction work on linear projects typically involves short-duration construction activities at individual sites along the length of the Proposed Project, resulting in construction duration at any single location typically lasting no more than a period of weeks. As a result, construction would not result in a substantial permanent increase in ambient noise levels in the vicinity above levels existing without the Proposed Project. The impact would be less than significant.

Operation Impacts

The primary permanent noise sources that would occur with the Proposed Project are limited to the proposed transmission lines and subtransmission lines. Operation of the existing substations, proposed distribution, and the proposed telecommunications facilities would not generate significant noise levels. In addition, O&M activities at the substations and along the infrastructure would be conducted using aerial inspection and light- and medium-duty vehicles, and would be similar in nature and frequency to O&M activities that currently occur. Therefore, the existing operation noise levels at the substations, proposed distribution, and proposed telecommunication facilities would not substantially change or increase compared to existing conditions.

As shown in Table 4.12-6, Transmission and Subtransmission Line Voltage and Audible Noise Levels, the proposed 220 kV transmission lines and 66 kV subtransmission lines would generate a noise level of less than 40.4 dBA and 33.5 dBA, respectively. The existing ambient noise levels range from 39.2 to 63.1 dBA L_{eq} within the Project Study Area. Noise levels generated from the 66 kV subtransmission lines would be lower than the existing ambient noise level while the 220 kV transmission lines would be higher than the existing ambient noise level. The proposed 220 kV transmission lines are located approximately 50 feet from the closest residence. The proposed 220 kV transmission lines are assumed to be approximately 110 feet from the ground given that the LST tower height ranges between 110 feet to 184 feet. At approximately 50 feet from the 220 kV

transmission line, the closest residence could be subject to a corona noise level of 39.8 dBA. Although this level is slightly higher than the ambient noise level in certain locations within the Proposed Project, the increase in noise level of 0.6 dBA would not be perceptible to a human ear in an outdoor environment and is not considered to be substantial. Therefore, operation of the Proposed Project would not result in a substantial permanent increase in ambient noise levels in the vicinity above levels existing without the Proposed Project. The Proposed Project's transmission lines and subtransmission lines would not result in a substantial permanent increase in ambient noise levels in the Proposed Project vicinity above levels existing without the Proposed Project. The impact would be less than significant.

Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

The following discussion addresses all Proposed Project components, including substation modifications, 220 kV transmission lines, 66 kV subtransmission lines, 12 kV distribution lines, and telecommunication facilities.

Construction Impacts

Based on the measurements conducted in the Project Study Area, the existing ambient noise levels range from 39.2 to 63.1 dBA L_{eq}. Construction-related activities, including helicopter use, based on the analysis above for the Proposed Project, could range from 38.2 to 88.3 dBA L_{eq}.

Consequently the construction activities could result in a substantial temporary increase of the existing ambient noise levels; however, construction activities would be intermittent and temporary in nature. Additionally, during construction activities, the following common operating procedures may be utilized to further reduce noise levels. Standard procedures may include, but are not limited to, confining activities to typical daytime hours, utilization of equipment to reduce noise (e.g., mufflers and engine shrouds) that are no less effective than those originally installed, traffic being routed away from residences and schools where practicable, and the minimization of unnecessary idling time of the construction equipment. As such, there would be a less than significant impact.

Operation Impacts

Operations and maintenance activities along the transmission infrastructure are conducted using aerial inspection and light- and medium-duty vehicles that are similar in nature and frequency to O&M activities, occurring prior to construction. In addition, as discussed above, corona noise levels associated with the new 220 kV transmission lines and 66 kV subtransmission lines would generate audible noise less than 40.4 dBA and 33.5 dBA, respectively. The existing ambient noise levels range from 39.2 to 63.1 dBA L_{eq} within the Project Study Area. Noise levels generated from the 66 kV subtransmission lines would be lower than the existing ambient noise level and would not exceed the noise standard for each local jurisdiction shown in Table 4.12-8, Summary of Local Noise Regulations – Operation-Related Limits. The proposed 220 kV transmission lines are

located approximately 50 feet from the closest residence. The proposed 220 kV transmission lines are assumed to be approximately 110 feet from the ground given that the LST tower height ranges between 110 feet to 184 feet. At approximately 50 feet from the 220 kV transmission line, the closest residence would be subject to a corona noise level of 39.8 dBA. Although this level is slightly higher than the ambient noise level in certain locations within the Project Study Area, it would not exceed the noise standard of each local jurisdiction shown in Table 4.12-8, Summary of Local Noise Regulations – Operation-Related Limits. Also, a noise increase of 0.6 dBA above existing ambient noise levels in certain locations within the Project Study Area would not be perceptible to the human ear in an outdoor environment. Therefore, operation of the Proposed Project would not result a substantial temporary or periodic increase in ambient noise levels in the Proposed Project vicinity above levels existing without the Proposed Project. As a result, less than significant impacts related to this topic would occur.

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, would the project expose people residing or working in the project area to excessive noise levels?

The following discussion addresses construction and operation of all Proposed Project components, including substation modifications, 220 kV transmission lines, 66 kV subtransmission lines, 12 kV distribution lines, telecommunication facilities, and the establishment of staging yards.

Construction and Operation Impacts

There are no public airports or public use airports located within 2 miles of the Proposed Project. The San Bernardino International Airport and Redlands Municipal Airport are approximately 5 miles north of the Proposed Project corridor near the west end of the Proposed Project corridor. The Banning Airport is located near the midpoint of the Proposed Project corridor, approximately 2 miles south. The Palm Springs International Airport is located approximately 8 miles south of the Proposed Project.

The Banning Airport is located approximately 2 miles from the Proposed Project. People working in the vicinity of the Proposed Project would be outside of the 60 dBA CNEL airport contour line. Therefore, noise levels associated with nearby public airport or public use airports would result in a less than significant impact.

For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The following discussion addresses construction and operation of all Proposed Project components, including substation modifications, 220 kV transmission lines, 66 kV subtransmission lines, 12 kV distribution lines, telecommunication facilities, and the establishment of staging yards.

Construction and Operation Impacts

There are no private airstrips located within the vicinity of the Proposed Project; therefore, the Proposed Project would not expose people working in the Project Study Area to excessive noise levels attributable to a private airstrip, and impacts would be less than significant.

4.12.4.2 NEPA Impact Analysis

Based on the analysis performed, it is anticipated that the Proposed Project would not result in significant effects under NEPA.

4.12.5 Applicant Proposed Measures

The Proposed Project would result in less than significant impacts related to noise. Therefore, no Applicant Proposed Measures are proposed.

4.12.6 Alternative Project

The 220 kV Line Route Alternative 2 (Alternative Project) would include relocation of an approximately 3-mile section of Segment 5 of the existing WOD corridor pursuant to an agreement between SCE and Morongo. Both the Proposed Project and the Alternative Project include the same common elements outside of Segment 5 (including the same modifications to existing substations, the same 66 kV subtransmission line relocations in Segment 1, and the same modifications to the telecommunications system). This section focuses on the differences between the Proposed Project and Alternative Project portions of Segment 5.

The removals for Segment 5 would be the same for the Proposed Project and the Alternative Project; however, the Alternative Project is 0.13 mile longer, and there are some minor differences regarding installation. For example, the Alternative Project would require two additional double-circuit LSTs and commensurate additional length in circuit length, conductor, and optical ground wire.

The Alternative Project would be located in the area of vacant land and not close to any noise-sensitive receptor. The Alternative Project would require only a marginal increase in the number of workers, site preparation, and work days due to the slightly longer route beyond those required by the Proposed Project. Therefore, the increase in noise would be considered minimal from construction work areas during Proposed Project construction. Also, noise levels generated from the operations of the Alternative Project would be similar to the Proposed Project. Therefore, the Alternative Project would have the same noise impacts as the Proposed Project.

4.12.7 No Project Alternative

The No Project Alternative would not result in construction or operation of the Proposed Project. No construction noise impacts or operation noise impacts would result.

4.12.8 References Cited

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City of Calimesa, California. Municipal Code § 8.15.080, Construction Equipment.

City of Colton, California. Municipal Code § 18.42.040, Noise.

City of Colton, California. Municipal Code § 18.42.050, Vibration.

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City of Loma Linda, California. Municipal Code § 9.20.050, Prohibited noises.

City of Palm Springs, California. Municipal Code § 11.74.032, Noise Level Limit.

City of Palm Springs, California. Municipal Code § 11.74.043(J), Loud, Unusual Noises.

City of Palm Springs, California. Municipal Code § 8.04.220, Limitation of hours of construction.

City of Redlands, California. Municipal Code § 8.06.070, Exterior Noise Limits.

City of Redlands, California. Municipal Code § 8.06.090(G), Noise Disturbance.

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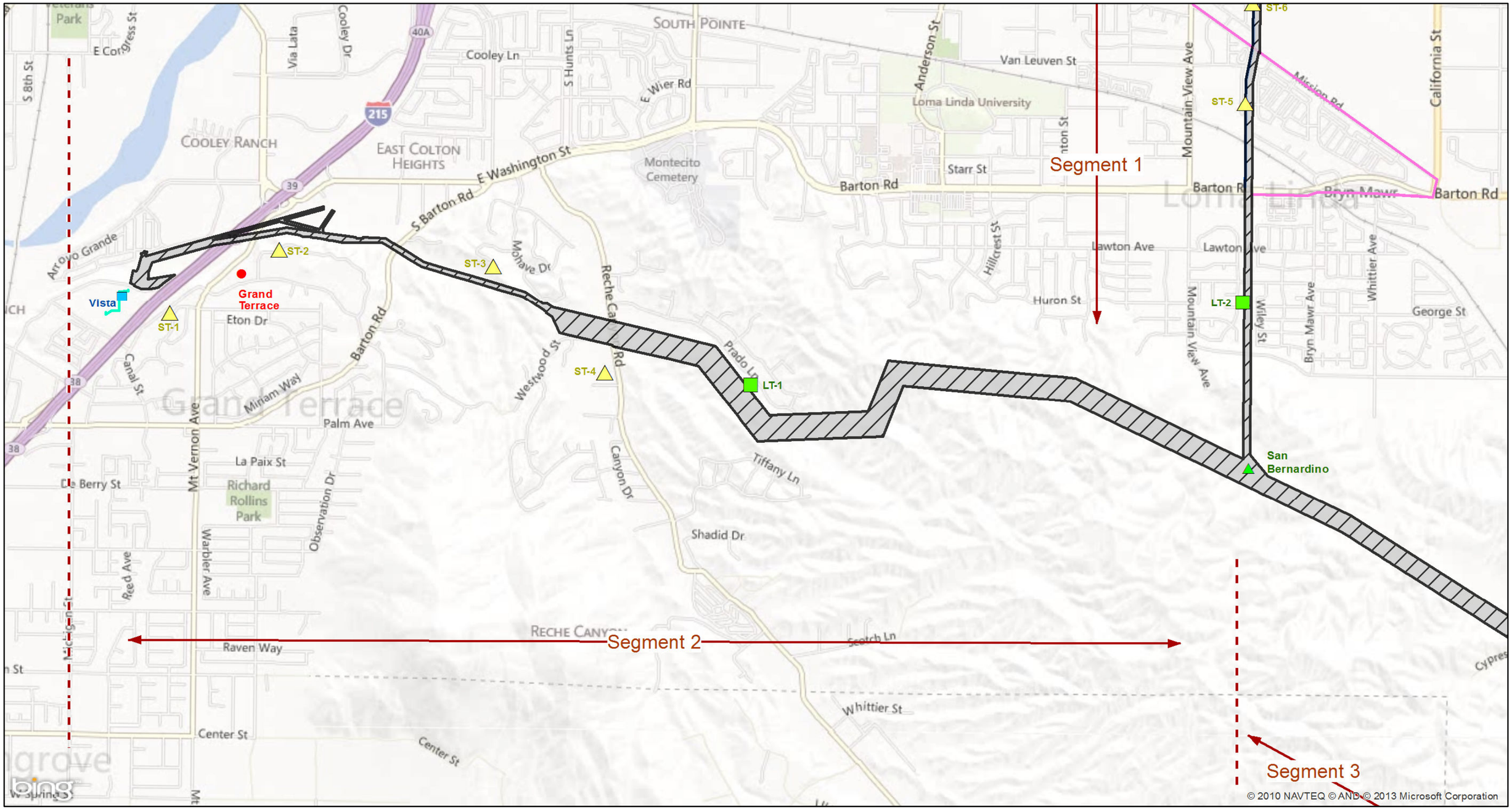

SOUTHERN CALIFORNIA EDISON
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- Transmission Line Right of Way
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- Proposed Transmission Line Right of Way
- Proposed Alternative Transmission Line Right of Way
- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
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- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 1 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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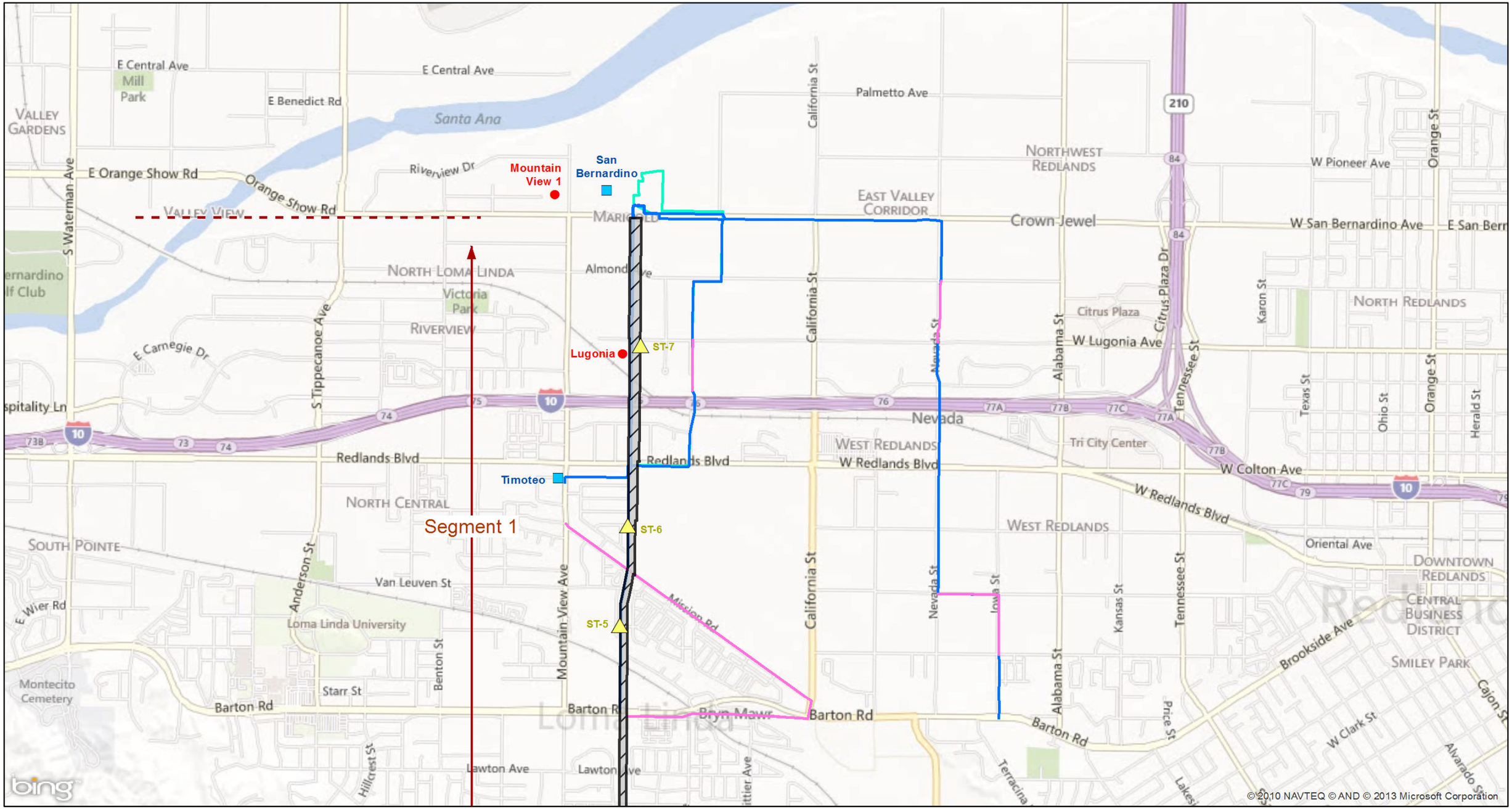

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- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
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- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 2 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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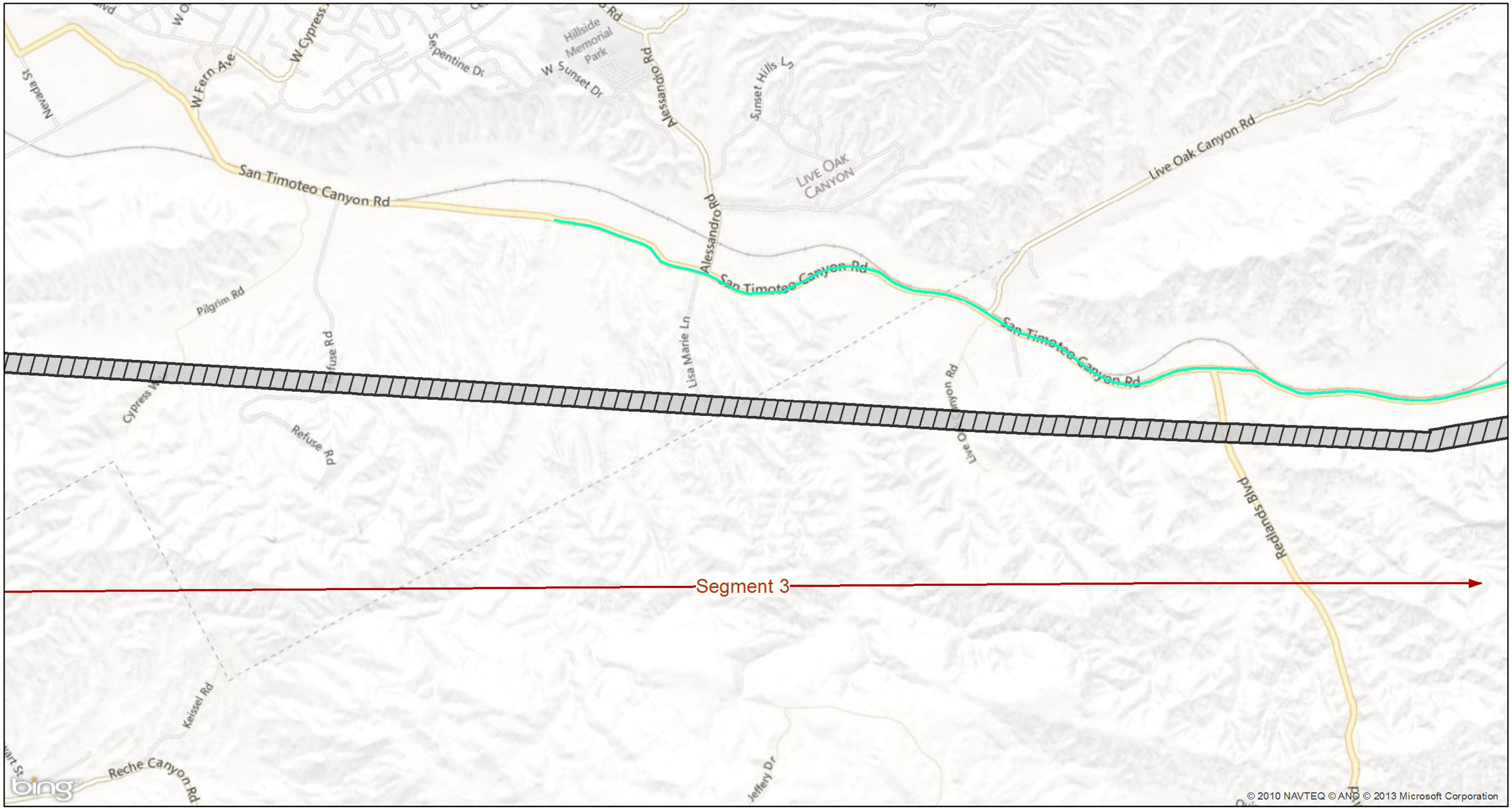

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- Proposed Alternative Transmission Line Right of Way
- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 3 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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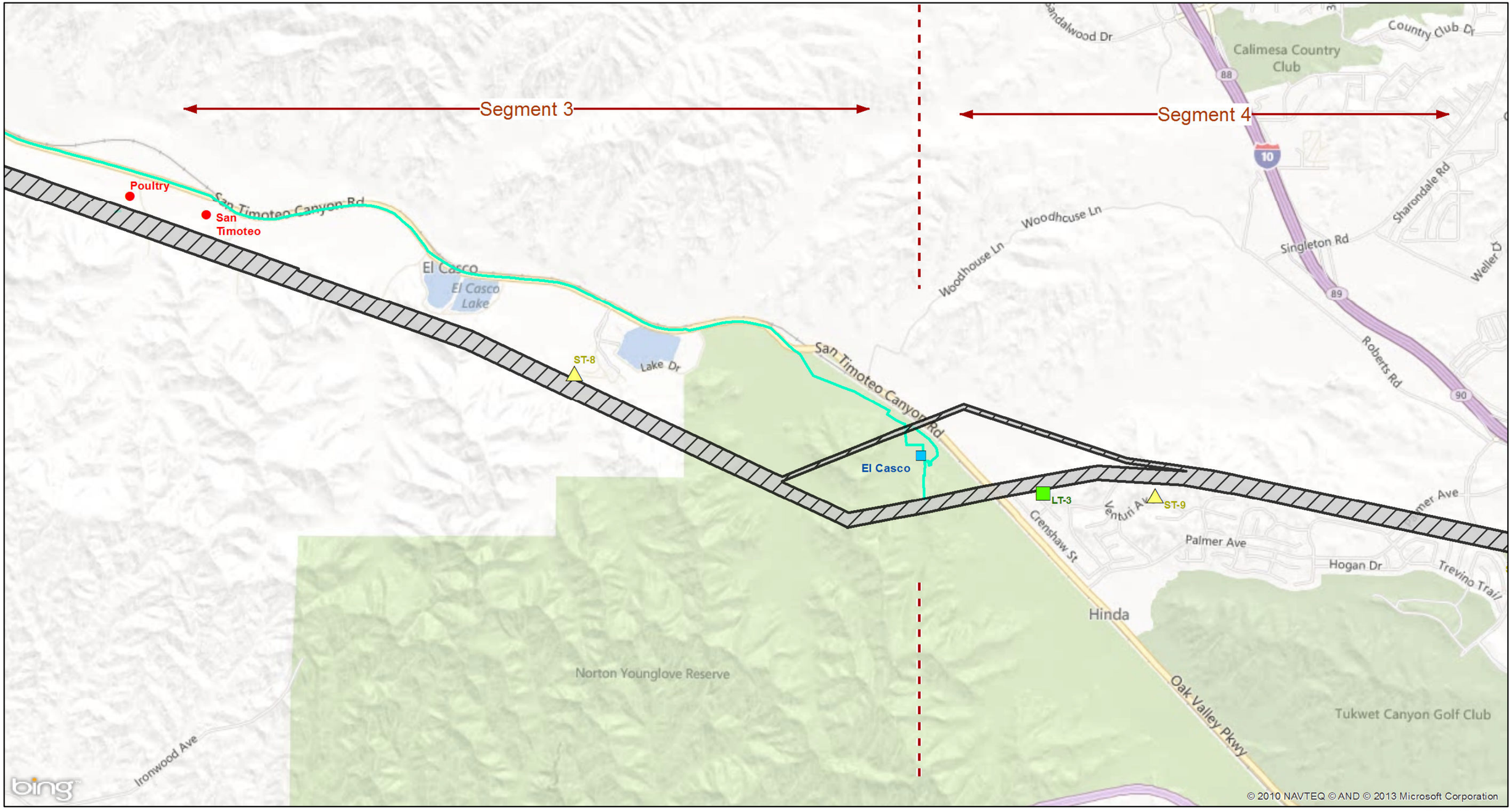

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An EDISON INTERNATIONAL Company

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- Proposed Transmission Line Right of Way
- Proposed Alternative Transmission Line Right of Way
- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1
Sheet 4 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project
Noise Monitoring Locations

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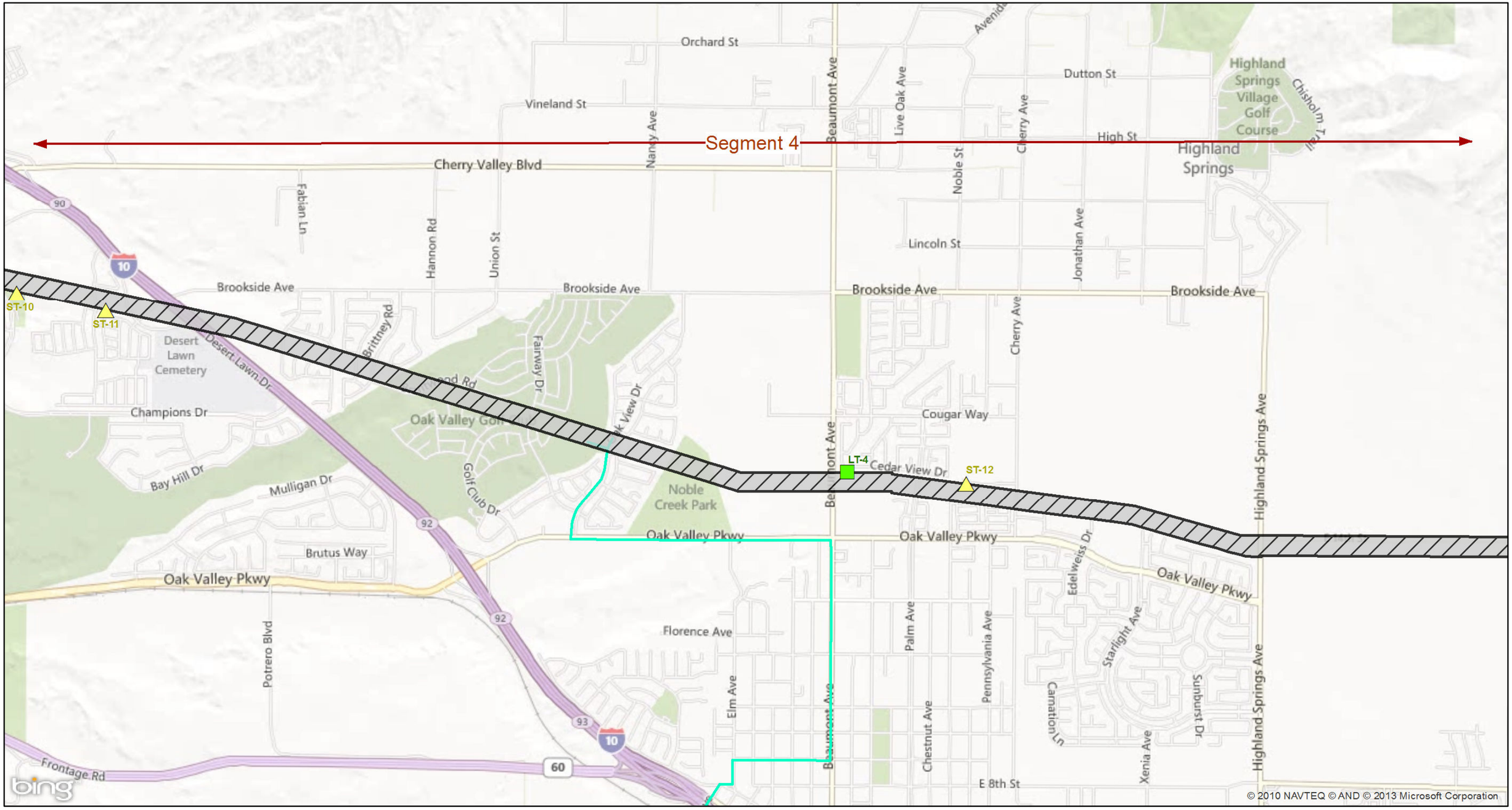

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An EDISON INTERNATIONAL Company

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- Proposed Alternative Transmission Line Right of Way
- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 5 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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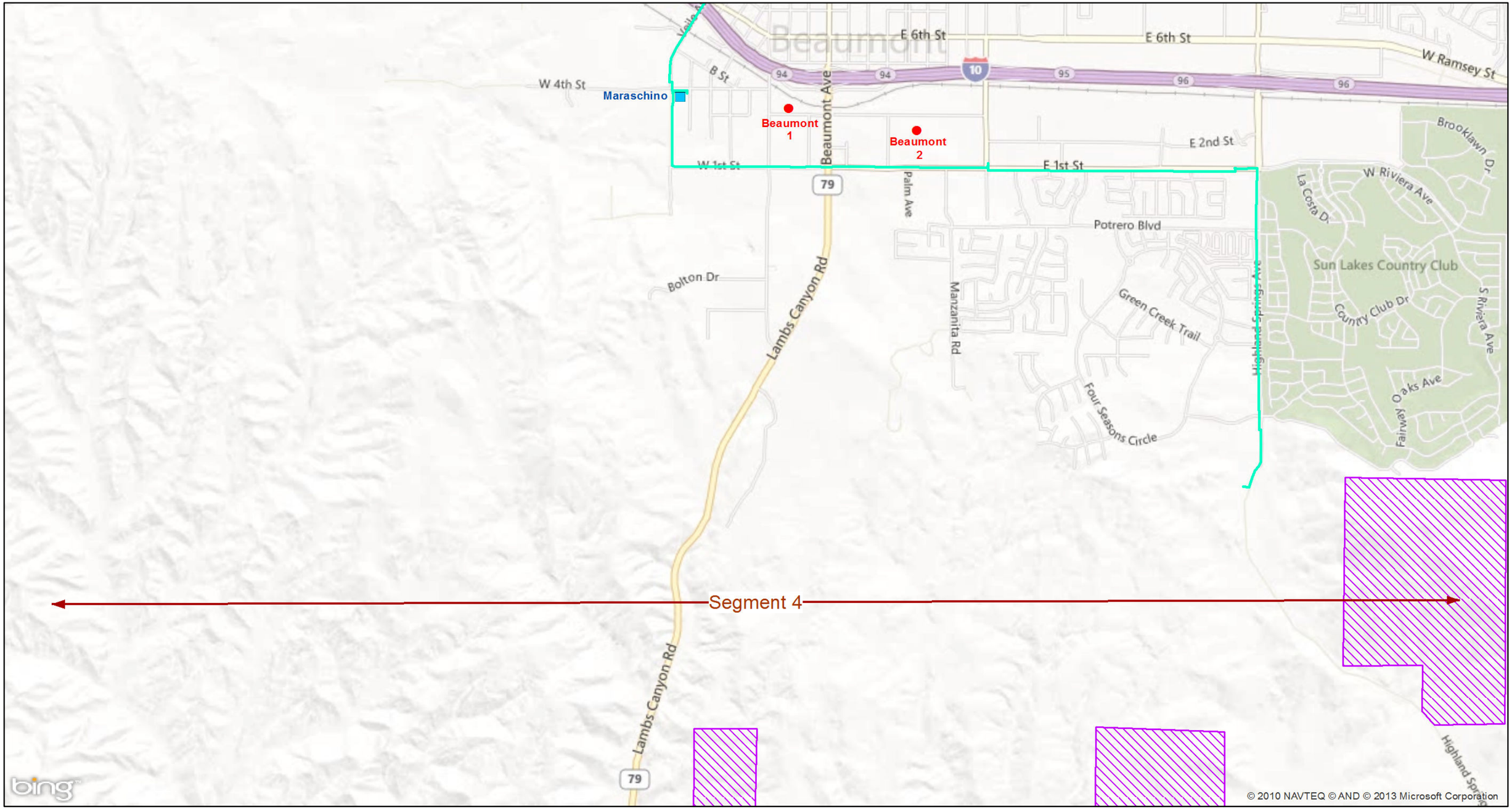

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- Transmission Line Right of Way to be Removed
- Proposed Transmission Line Right of Way
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- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 6 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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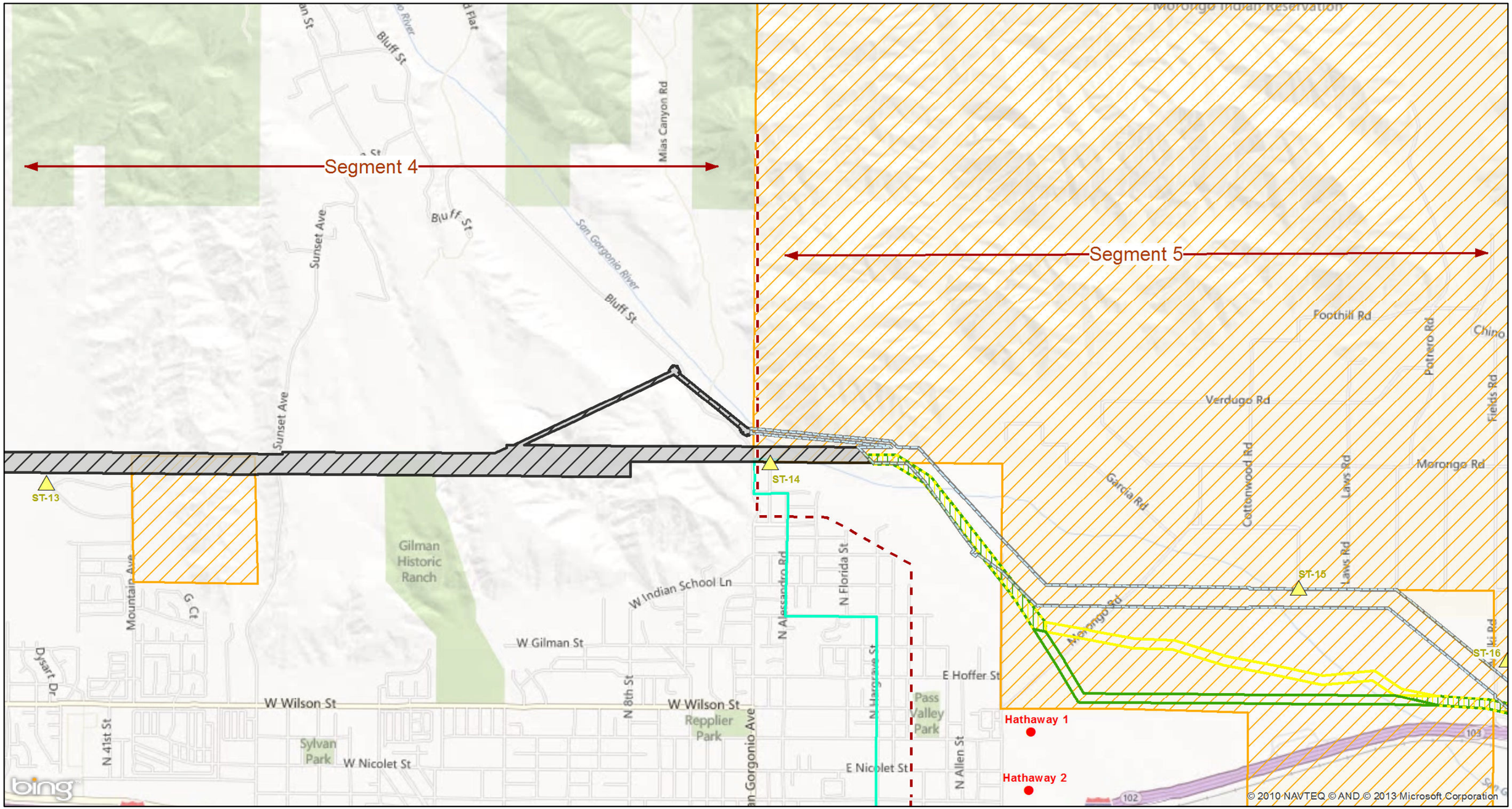

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- Staging Yards
- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 7 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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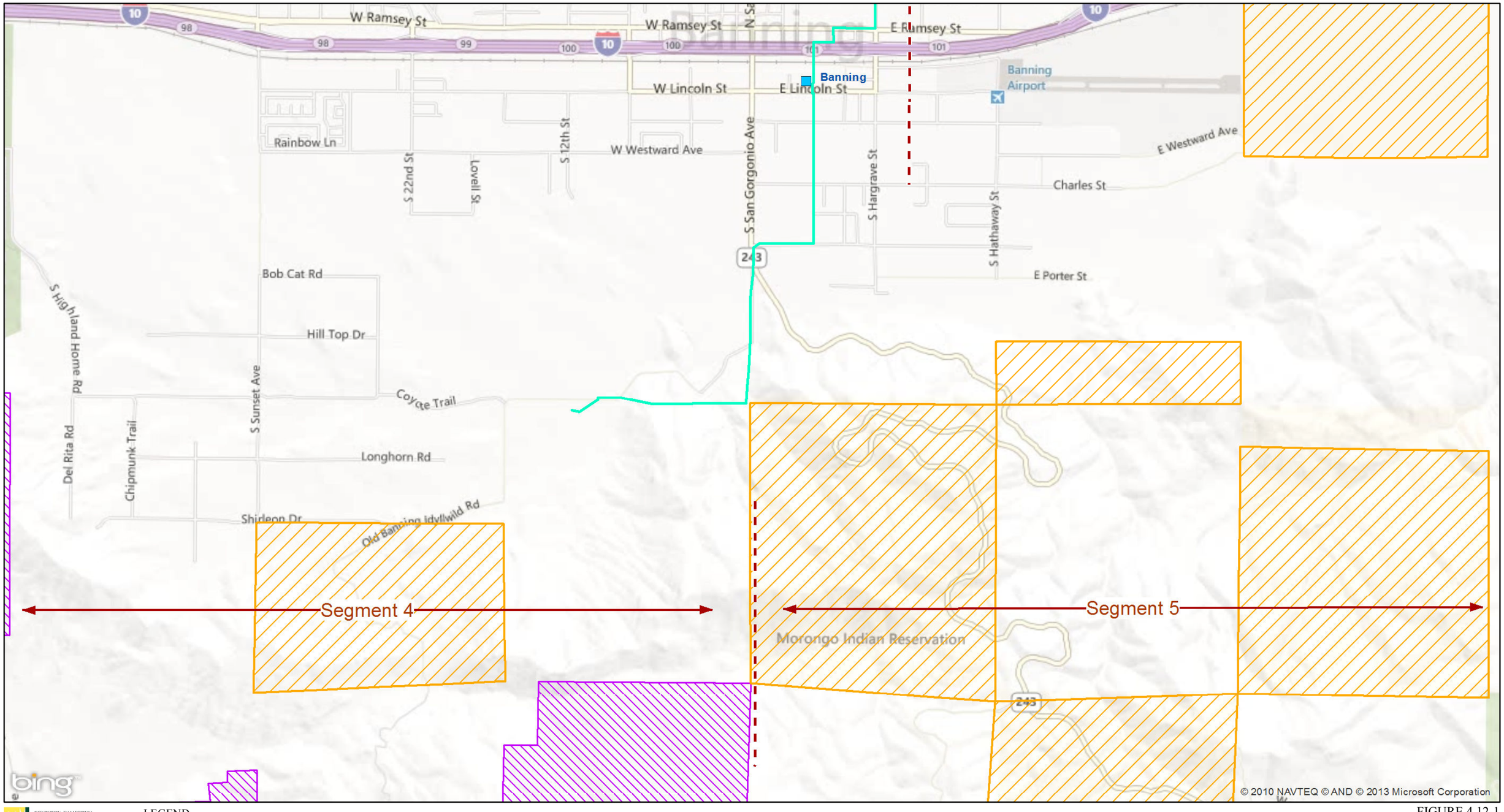

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- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 8 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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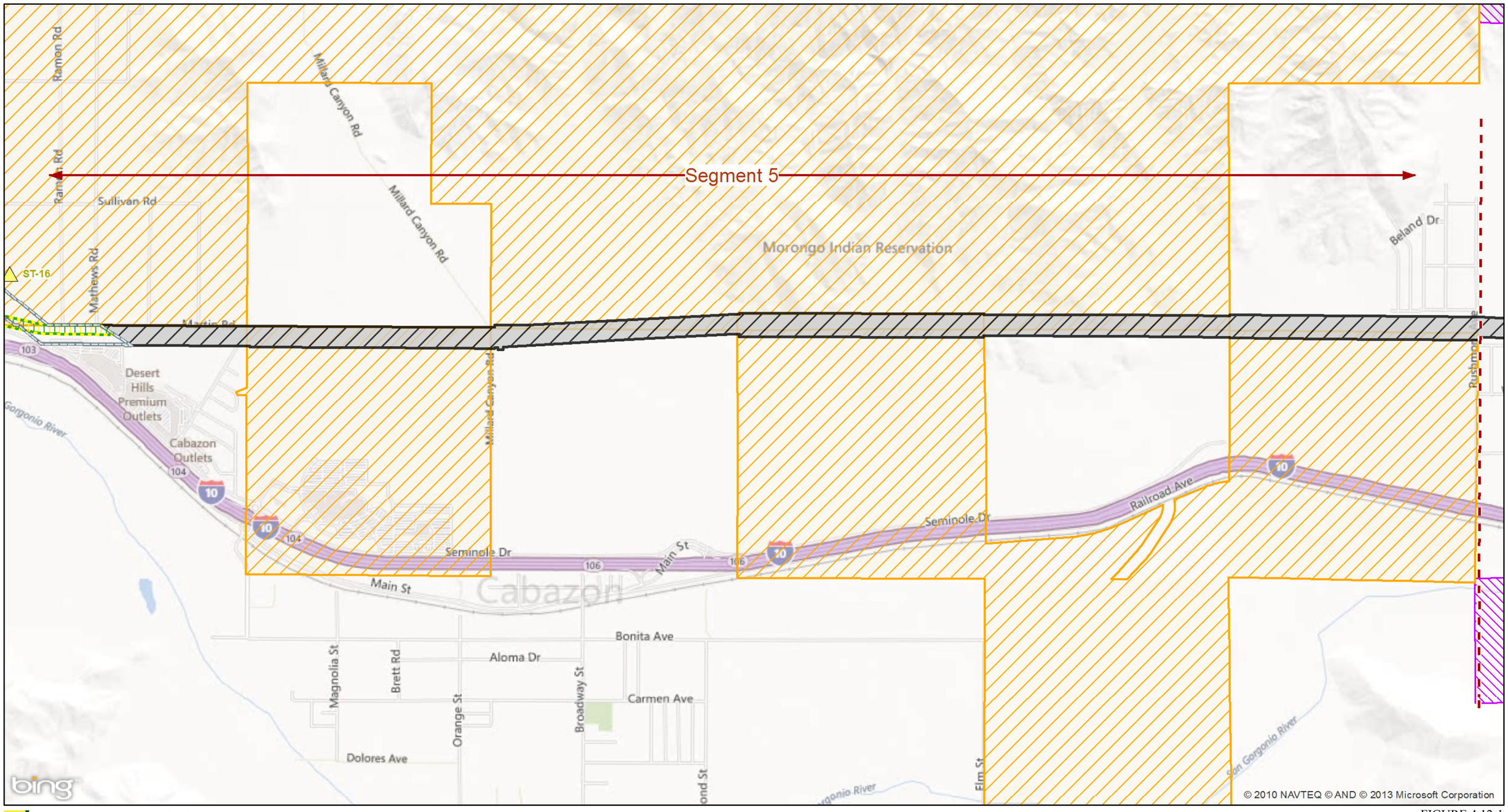

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- Proposed Transmission Line Right of Way
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- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
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- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 9 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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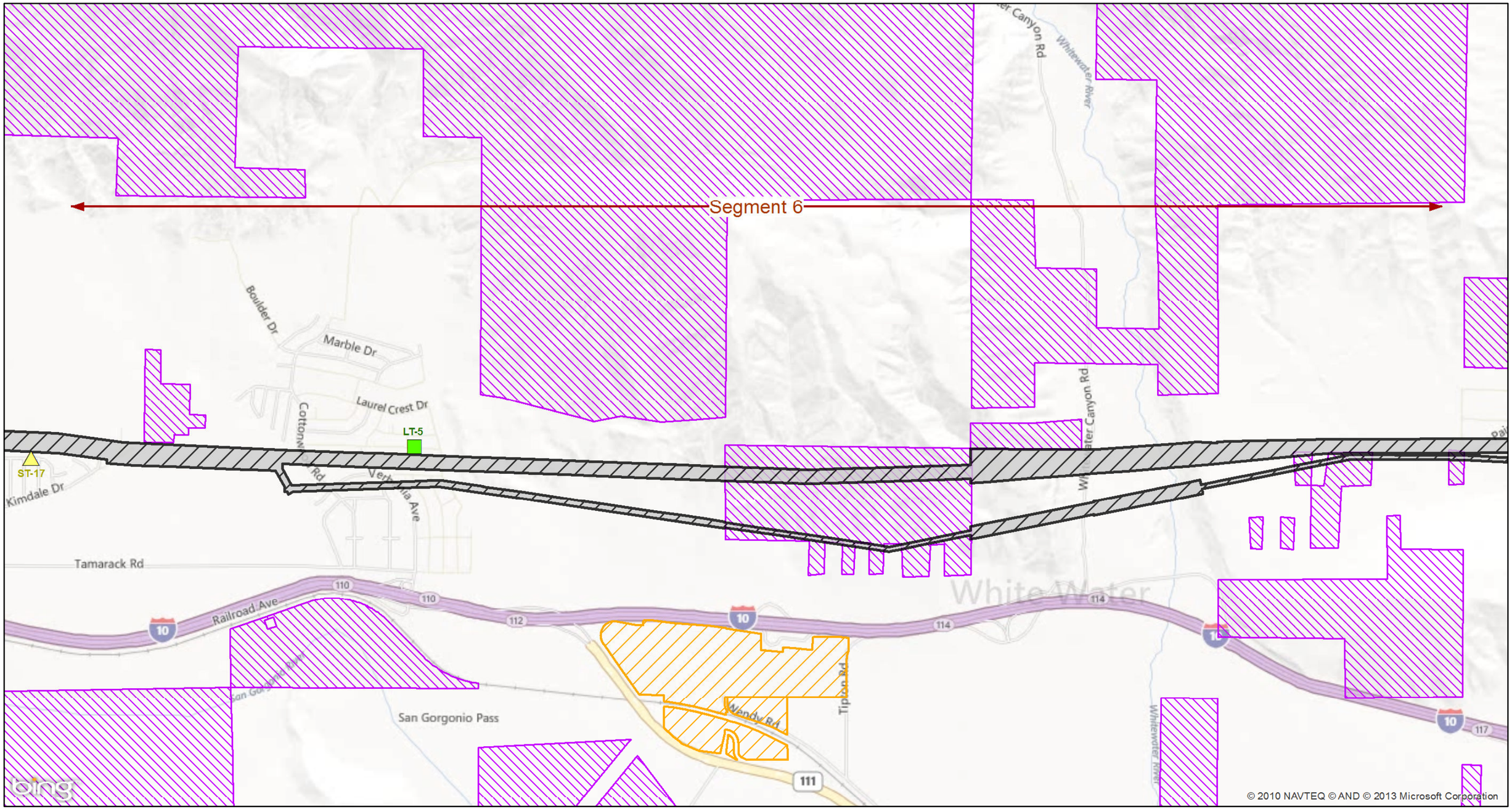

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- Proposed Transmission Line Right of Way
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- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FEET

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FIGURE 4.12-1
Sheet 10 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project
Noise Monitoring Locations

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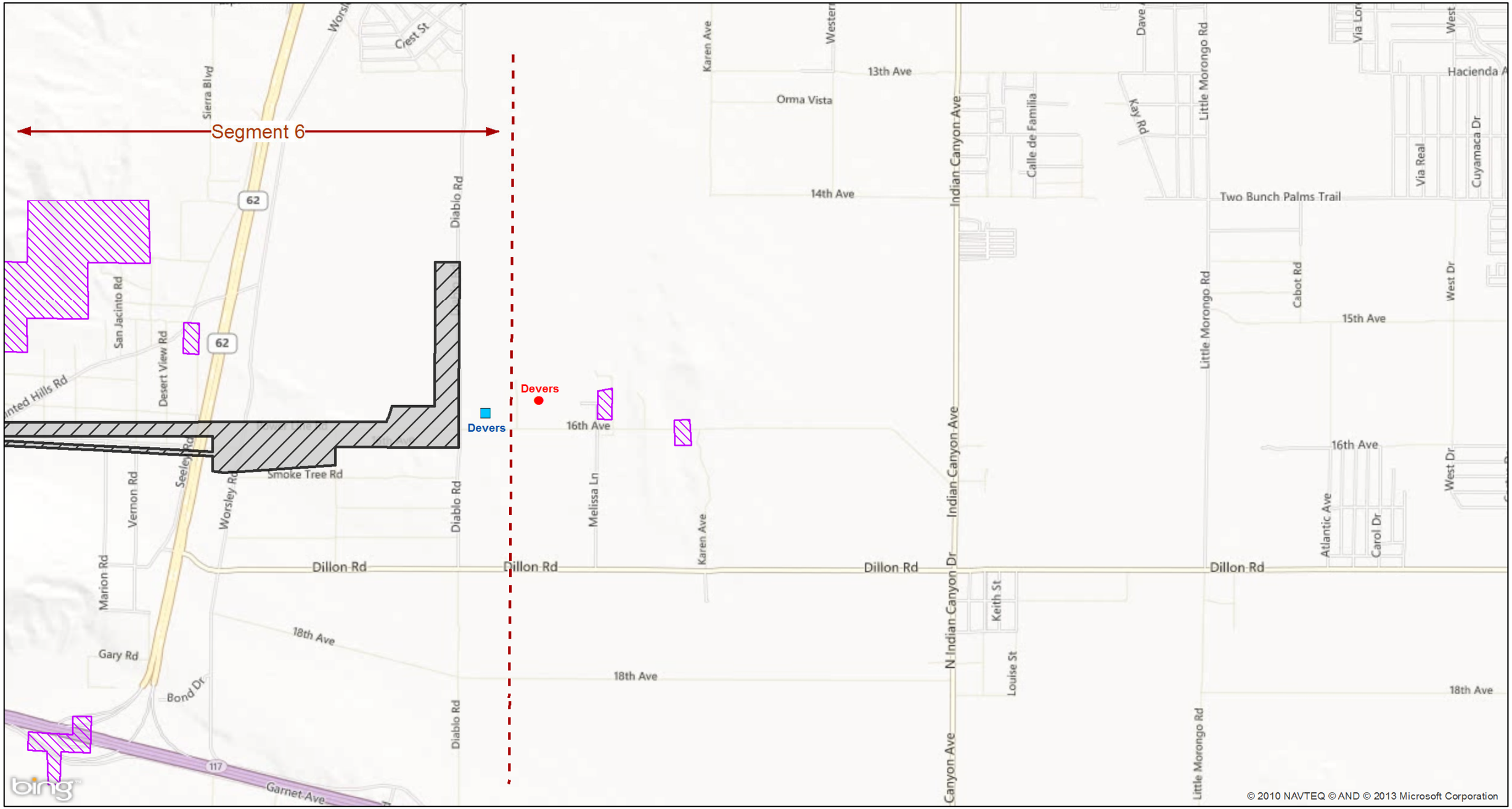

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LEGEND

- Transmission Line Right of Way
- Transmission Line Right of Way to be Removed
- Proposed Transmission Line Right of Way
- Proposed Alternative Transmission Line Right of Way
- Proposed Transmission Line Right of Way Common to Both
- Staging Yards
- Substations
- Junction
- Telecommunication Line Routes
- Relocated Subtransmission Line Routes
- Relocated Distribution Line Routes
- Segment Breaks
- Noise Monitor
- Long-Term 24-Hour Monitor

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FIGURE 4.12-1

Sheet 11 of 11

Sheet Index

Southern California Edison
West of Devers Upgrade Project

Noise Monitoring Locations

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