NOISE TECHNICAL REPORT
(CWA #8)

RIVERSIDE TRANSMISSION RELIABILITY PROJECT (RTRP)
RIVERSIDE, CALIFORNIA

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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GLOSSARY OF TERMS AND ACRONYMS

α	included angle
AN	audible noise
APM	applicant proposed measure
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Riverside
CNEL	Community Noise Equivalent Level
County	County of Riverside
CPUC	California Public Utilities Commission
dB	decibel
dBA	a-weighted decibel
EIR	Environmental Impact Report
EPRI	Electric Power Research Institute
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-15	Interstate 15
in/sec	inches per second
ISO	International Organization for Standardization
kV	kilovolt
LB	long barrier
L_{dn}	day/night average sound level
L_{max}	maximum noise level
LD	Larson-Davis, Inc.
L_{eq}	equivalent noise level over a period of time
LT	long-term
MB	medium barrier
mph	miles per hour
NSA	Noise Study Area
ppv	peak particle velocity
RI	Radio Interference
RN	Radio Noise
RPU	Riverside Public Utilities
RTRP	Riverside Transmission Reliability Project
S	designed barrier performance
SB	short barrier

SCE	Southern California Edison
SLM	sound level meter
SR	State Route
ST	short-term
TL	transmission loss
TVI	Television Interference
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

1.1 PURPOSE OF STUDY

The purpose of this Noise Technical Report (Report) is to update the current noise analysis contained in *Final Environmental Impact Report Riverside Transmission Reliability Project* SCH#2007011113 ("EIR"), dated October 23, 2012, and as provided on the California Public Utilities Commission (CPUC) website[1]; and, address deficiency No. 2 relating to noise as described in the CPUC *Deficiency Report #2 for the Riverside Transmission Reliability Project Application* (A. 15-04-013), dated October 7, 2015 ("Deficiency Report") (CPUC 2015). Deficiency No. 2 in the Deficiency Report is a set of expectations and background that was stated as follows:

> *Provide additional data for daytime and night-time ambient noise levels in the proposed project area, including the existing homes and development along Wineville Avenue and Landon Drive. Provide noise level measurements at similar 230-kV transmission lines near the project area. Provide noise level planning contours at distances of 50-, 100-, and 200-feet from the proposed project for construction and operation of the proposed RTRP. The planning contours for construction should include cumulative noise generated from multiple pieces of construction equipment operating simultaneously.*
>
> *SCE Response to the Deficiency Report and the Final EIR both state the following with regard to construction noise, "noise would be short-term, occurring during daylight hours when the ambient noise levels are higher within the [RTRP] area". Further information is needed to define existing ambient noise levels in the project area and calculated noise levels at sensitive receptors along the alignment (i.e., at approved developments along the alignment).*
>
> *The RTRP EIR Volume 2 at pages 3-282 and 3-285 states that "Although corona noise varies widely with weather conditions and may be audible, no significant corona should be produced by lines energized below 345 kV (EPRI 1987). There would neither be a substantial nor a permanent increase in noise level." The Final EIR for the RTRP defines maximum corona noise levels during wet weather at 28 dBA; however the estimated noise level was not supported by noise measurements at similar 230-kV transmission*

[1] http://www.cpuc.ca.gov/Environment/info/panoramaenv/RTRP/PDF/Application/FEIR%20Vol%202/3_DEIR_ENVIRONMENTAL_ANALYSIS.pdf

lines in the area. Corona noise from a transmission line operating at 230-kV was measured at 29 dBA at 100 feet from the 230-kV transmission line during dry weather conditions in San Diego (SDG&E 2014). The maximum corona noise level may exceed 28 dBA at sensitive receptors.

Corona noise impacts would affect a larger number of sensitive receptors than considered in the Final EIR. Sensitive receptors to noise, such as residents of the new Riverbend housing project, were not contemplated in the Final EIR impact analysis, as this housing development was not constructed or approved at the time of the Final EIR.

Applicable information in the noise section of the EIR was utilized or referenced in the preparation of this Report. With scope limited to the proposed "I-15" 230 kV double-circuit transmission line (one of the Riverside Transmission Reliability Project [RTRP] features as described in the EIR, to be herein referred to as the "Project"), this Report presents the results of a new outdoor ambient noise level survey completed in its vicinity; analyzes potential impacts to noise-sensitive receptors resulting from the construction and operation (i.e., audible corona noise) of the Project,; and identifies avoidance, minimization, and mitigation measures to reduce potential significant noise impacts to noise-sensitive receptors.

1.2 PROJECT BACKGROUND

Background on the proposed Project is provided from the Project description from the EIR, as follows:

Pursuant to Southern California Edison's (SCE) Federal Energy Regulatory Commission (FERC)-approved Transmission Owner Tariff, Riverside Public Utilities (RPU) submitted a request in 2004 for SCE to provide additional transmission capacity to meet projected load growth and to provide for system reliability. SCE performed a series of interconnection studies that determined it could not expand Vista Substation, located in Riverside County, due to site and environmental constraints but could expand the regional electrical system to provide RPU a second source of transmission capacity to import bulk electric power. This would be accomplished by creation of a new SCE 230 kilovolts (kV) transmission connection, the construction of a new SCE substation, the construction of a new RPU substation, and the expansion of the RPU 69 kV subtransmission system. The RTRP would provide RPU with long-term system capacity for load growth, and needed system reliability and flexibility. Project components for the RTRP include construction of the new 230 kV structures and some new 69 kV structures, *development of temporary construction and permanent access roads, and temporary pulling sites.*

The additional transmission capacity to RPU would be available through the new SCE Wildlife Substation at 230 kV and then transformed to 69 kV for integration into the RPU electrical system serving the City of Riverside (City). The transformation or "stepping down" of power from 230 kV to 69 kV would take place at a new substation, named Wilderness Substation, which would be a 230/69 kV substation, owned and operated by RPU. Wilderness and Wildlife Substations would be located adjacent to each other on property that is presently owned by and within the City.

In order to integrate the additional transmission capacity into RPU's electrical system, RPU's 69 kV system would be expanded and divided into eastern and western systems. The existing source of energy from Vista Substation would continue to supply the eastern system, while the western system would be supplied through the proposed Wilderness Substation. Creating two separate 69 kV subsystems is necessary for prudent electric utility operation and would also help provide the required level of emergency back-up service, particularly in the event of an interruption to either 230/69 kV substation source.

Several new double-circuit 69 kV subtransmission lines would need to be constructed between 69 kV substations within the City. To accommodate these new subtransmission lines, upgrades would be required at four existing RPU 69 kV substations. The upgrades would take place within the existing boundaries of each substation.

New fiber optic communications would also be required for system control of Wilderness and Wildlife Substations and associated 69 kV and 230 kV transmission lines. The 69 kV communications would meet SCE's reliability standards.

1.3 PROJECT LOCATION

The Project area is located in the northwest portion of Riverside County (County), California, with portions of the Project area within the Cities of Riverside and Jurupa Valley (Figure 1). The Project area is bordered on the north by State Route (SR) 60 and the existing Mira Loma to Vista SCE Transmission Lines, on the west by Interstate 15 (I-15), and on the southeast by SR-91 (Figure 1). Land use within the Project area and immediate vicinity includes single-family residential, agricultural, and commercial development, as well as undeveloped open space.

Source: City of Riverside

No Scale

Figure 1
Regional Map

1.4 PROJECT DESCRIPTION

SCE proposes to construct a new SCE 230-kilovolt (kV) transmission line, which has a centerline alignment, as depicted in Figure 2 Project components to be installed along its alignment would thus include towers or lattices, new conductors, and interconnections to existing SCE infrastructure.

As summarized in the EIR, and for purposes of this noise study, the proposed 230-kV transmission line (maximum operating voltage of 242 kV) is a double-circuit design, with each of three phases comprising two subconductors separated by 18 inches with the height of the conductor an average of 25 meters above grade.

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Figure 2
Proposed Project Map

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2.0 NOISE AND VIBRATION TERMINOLOGY

2.1 NOISE DESCRIPTORS

Noise is generally defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment. The unit of measurement used to describe a noise level is the decibel (dB); decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Human Perception of Noise

The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, a method called “A-weighting” is used to filter noise frequencies that are not audible to the human ear. The A-scale approximates the frequency response of the average young ear when listening to most ordinary everyday sounds. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale levels of those sounds. Therefore, the “A-weighted” noise scale is used for measurements and standards involving the human perception of noise. In this Report, all noise levels are A-weighted and “dBA” is understood to identify the A-weighted dB. Table 1 provides typical noise levels associated with common activities.

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two noise sources do not sound twice as loud as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA (increase or decrease); that a change of 5 dBA is readily perceptible; and that an increase (or decrease) of 10 dBA sounds twice (or half) as loud (Caltrans 2011).

Averaging Noise Levels

In addition to noise levels at any given moment, the duration and averaging of noise over time is also important for the assessment of potential noise disturbance. Noise levels varying over time are averaged over a period of time, usually hour(s), expressed as dBA L_{eq}. For example, $L_{eq(3)}$ would be a 3-hour average noise level. When no period is specified, a 1-hour average is assumed ($L_{eq(1)}$ or L_{eq}).

Table 1
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
-	110	Rock Band
Jet Fly-over at 300 m (1,000 ft)	100	-
Gas Lawn Mower at 1 m (3 ft)	90	-
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	80	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	60	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	50	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
-	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2011
Notes: m=meters
ft=feet
km/hr=kilometers per hour
mph=miles per hour

The time of day of noise is also an important factor to consider when assessing potential community noise impacts, as noise levels that may be acceptable during the daytime hours may create disturbance during evening or nighttime hours, when people are typically at home and sleeping. The Community Noise Equivalent Level (CNEL) is a descriptor used to characterize average noise levels over a 24-hour period, calculated from hourly L_{eq} values, with 5 dBA added to the hourly L_{eq} levels occurring between 7:00 p.m. and 10:00 p.m. and 10 dBA added to the hourly L_{eq} levels occurring between 10:00 p.m. and 7:00 a.m., to reflect the greater disturbance potential from evening and nighttime noise, respectively. The day/night average sound level (L_{dn}) is the same as the CNEL, except the evening period is included as part of the daytime period.

General Characteristics of Community Noise

Ambient noise levels are generally considered low when below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. Outdoor L_{dn} levels over 50 dBA vary depending on the specific type of land use. In wilderness areas, L_{dn} noise levels average approximately 35 dBA, in small towns or wooded residential areas approximately 50 dBA, in urban downtown areas (e.g., City of Riverside) approximately 75 dBA, and near major freeways and airports approximately 85 dBA. Average ambient levels in urban environments at night are about 7 dB lower than the corresponding daytime average ambient levels. The day-to-night difference in rural areas away from roads and other human activity can be considerably less. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they are still considered adverse levels of noise to public health (USEPA 1974).

Corona Audible Noise (AN)

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 partial breakdown of the electrical insulating properties of the air surrounding the conductors. When the intensity of the electric field at the surface of the conductor exceeds the insulating strength of the surrounding air, a corona discharge occurs at the conductor surface, representing a small dissipation of heat and energy. Some of the energy may dissipate in the form of small local pressure changes that result in audible noise or in radio or television interference. Audible noise generated by corona discharge is characterized as a hissing or crackling sound that may be accompanied by a 120-Hz hum.

Slight irregularities or water droplets on the conductor and/or insulator surface accentuate the electric field strength near the conductor surface, thereby making corona discharge and the associated audible noise more likely. Under "foul" weather conditions such as rain and high wind, ambient noise levels generated by the interaction of these conditions with the environment (e.g., rainfall on road pavement or rooftops) would generally be higher (and would thus potentially mask) than those generated by the corona effect from transmission line operation. Therefore, audible noise from transmission lines is generally a phenomenon experienced when high moisture content in the air, or subsequent to a precipitation event, provides opportunities for condensation or other wetting of the transmission line conductor surfaces. However, during "fair" dry weather, insects and dust on the conductors can also serve as sources of corona discharge, making the associated audible noise more likely.

Noise Attenuation

From the source to the receiver, noise changes both in level and frequency spectrum. The most obvious change is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on the following important factors: geometric divergence, ground absorption, atmospheric effects and refraction, shielding by natural and man-made features, noise barriers, diffraction, and reflection.

For a point or stationary noise source, such as construction equipment, the attenuation or drop-off in noise level would, due to geometric divergence, be at least -6 dBA for each doubling of unobstructed distance between source and the receiver and could attenuate to -7.5 dBA depending on the acoustic characteristics of the intervening ground. For a linear noise source, such as vehicles traveling on a roadway, the attenuation or drop-off in noise level would be approximately -3 dBA for each doubling of unobstructed distance between source and the receiver. While varying with temperature and humidity, atmospheric absorption can reasonably be expected to provide up to 1 dBA of attenuation per thousand feet that sound travels between a source and the receiver. Ground absorption effects, which depend on surface porosity and other characteristics, can be expected to provide up to an additional -4.8 dBA of noise attenuation (ISO 1996).

A large object in the path between a noise source and a receiver can significantly attenuate noise levels at that receiver. The amount of attenuation provided by this “shielding” depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, as well as man-made features, such as buildings and walls, can significantly alter noise levels. Walls or berms are often specifically used to reduce, or attenuate, noise.

Noise-Sensitive Receptors

Some land uses are considered more sensitive to noise than others due to the types of persons or activities involved, such as sleeping, reading, talking, or convalescing. Noise-sensitive receptors are generally considered those individuals engaged in activities, or occupying land uses, that may be subject to the stress of significant interference from noise, including, but not limited to, talking, reading, and sleeping. Typically, land uses associated with noise-sensitive human receptors include residential dwellings, hotels/motels, hospitals, nursing homes, educational facilities, and libraries.

2.2 VIBRATION

In addition to noise, construction activities generate vibration, which can be interpreted as energy transmitted in waves through the soil mass. These energy waves generally dissipate with distance from the vibration source, due to spreading of the energy and frictional losses. The energy transmitted through the ground as vibration, if great enough and in proximity to structures, can result in structural damage.

Typical outdoor sources of perceptible groundborne vibration are construction equipment and traffic on rough (i.e., unpaved or uneven) roads. Construction activity can also result in varying degrees of groundborne vibration, depending on the type of equipment, methods employed, distance between source and receptor, duration, number of perceived vibration events, and local geology.

Groundborne vibrations from typical construction activities do not often reach levels that can damage structures in proximity to construction, but their effects may manifest and be noticeable in buildings that are within 25 feet of construction activities. One major concern with regard to construction vibration is potential building damage, which is assessed in terms of peak particle velocity (ppv), typically in units of inches per second (in/sec). In addition to structural damage, the vibration of room surfaces affects people as human annoyance. Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Typically, a vibration level of 0.1 in/sec ppv is the threshold of human annoyance, and 0.2 ppv is the threshold of risk of structural damage.

Construction operations generally include a wide range of activities that can generate various levels of groundborne vibration. In general, blasting, pile driving, and demolition of structures generate the highest vibrations. Heavy truck transport can also generate groundborne vibrations, which vary depending on vehicle type, weight, and pavement conditions. At 25 feet, some construction equipment generates vibration at levels exceeding the threshold of human annoyance (0.1 in/sec ppv), and at levels exceeding the threshold of risk of structural damage (0.2 in/sec ppv). However, at 50 feet, this same equipment is below the thresholds of human annoyance and structural damage (FTA 2006).

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3.0 EXISTING CONDITIONS

3.1 LAND USES

The Project area is characterized by rural, urban, and suburban development intermixed with agriculture and undeveloped lands. Extensive areas in the central portion of the Project area (Santa Ana River floodplain) are preserved open space, set aside for recreation, wildlife, and protected species. Rapid population growth in the Project area has resulted in increased development with accompanying changes in land use. The Project area is almost entirely developed.

The natural topography of the Project area is valley lowland intersected by a sinuous river corridor, with isolated bluffs and rolling hills, surrounded by mountain ranges. Elevations range from 680 to above 1,900 feet above mean sea level; however, the Project transmission alignment would be located in relatively flat areas.

3.2 EXISTING NOISE ENVIRONMENT

Noise Sources

The noise environment in the proposed Project area is typical of a rural setting, except at locations more directly affected by noise sources from transportation, recreation, industrial, cattle and horse facilities, and commercial and residential development. Motor vehicles traveling on I-15, SR-60, and several other arterial roadways contribute to transportation-related noise along with occasional aircraft overflights. Intermittent noise from outdoor activities at the surrounding residences (e.g., people talking, operation of landscaping equipment, car doors slamming, and dogs barking), although minor, also influences the ambient noise environment.

The primary noise source on and surrounding the Project site is traffic noise including vehicular traffic on I-15, SR-60, SR-91, Van Buren Boulevard, and other secondary roads along the alignment. Secondary noise sources are activities at the surrounding industrial, agricultural, commercial, office, and residential areas, and distant train activity and aircraft flyovers. The existing noise environment surrounding the Project site (non-event) is primarily influenced by noise from vehicle traffic on the roadways adjacent to and in proximity to the Project site. The predominant traffic noise at the Project site and surrounding areas is from I-15 and SR-60. The

Project site is also adjacent to major truck transport facilities off of I-15 at the northern extent of the Project transmission alignment.

Traffic noise level on roadways is dependent upon traffic volume, speed, flow, vehicle mix, pavement type, and condition. At higher speeds, typically on freeways, highways, and primary arterials, the noise from tire/pavement interaction can be greater than from vehicle exhaust and engine noise. Generally, traffic noise is increased by heavier traffic volumes, higher speeds, and large trucks. Free-flowing traffic just before or just after peak traffic periods is often the noisiest. Peak traffic periods generally result in lower noise levels due to traffic congestion, which lowers traffic speeds (Caltrans 2011).

Railroad activity occurs in the vicinity of the Project site along two transcontinental rail lines, the Burlington Northern & Santa Fe Railroad, and the Union Pacific Railroad. Metrolink commuter trains also occur in the Project area, operated by the Riverside County Transportation Commission.

Random aircraft flyovers occur in the vicinity of the Project site from high altitude commercial and military jets; low elevation traffic and news helicopters; and low elevation, single-engine, fixed-wing aircraft. The closest airports to the Project site are Riverside Municipal Airport and Flabob Airport (approximately 1 mile south and 2.5 miles northeast, respectively, of the eastern extent of the Project transmission line alignment), Los Angeles/Ontario International Airport (approximately 4 miles northwest of the northern extent of the Project transmission line alignment), and Chino Airport (approximately 5 miles west of the western extent of the Project transmission line alignment).

3.3 NOISE-SENSITIVE RECEPTORS

As shown in Figure 2, the proposed transmission line alignment (moving west to east) would be located within the existing right-of-way of existing roadways of Wineville Avenue, Edison Road, I-15, and 68th Street; across open space of a golf course and a county park, and along the Santa Ana River floodplain. In some areas, the alignment is adjacent to existing residential, commercial, and industrial development; and adjacent to and/or transecting entitled and under-construction development (from the alignment's northern end to the river crossing). As shown in Figures 5A-D and 6A-D, the entitled and under-construction developments (i.e., residential, commercial, and/or industrial type) considered for this noise analysis include:

1. D.R. Horton Homes (residential)
2. Lennar Homes/Rancho Del Sol (residential)

3. Lyon Homes (residential)
4. Stratham Homes (residential)
5. Thoroughbred Farms Business Park (light industrial, business park, commercial)
6. APV 1 and 2 Homes (residential)
7. Vernola Marketplace Apartments (residential)
8. Riverbend Development (residential)

Noise Measurements and Observations

To characterize the existing ambient noise environment, noise measurements and observations were performed on the Project site and at nearby noise-sensitive receptors in proximity to the Project site. Noise measurement locations are shown in Figure 3. A combination of 11 short-term ("ST", 15-minute duration) during the day and night periods (22 total ST measurements), and 2 long-term ("LT", 24-hour day-night) noise measurements were performed over a 36-hour period on November 11 and 12, 2015. The noise measurements were performed along the Project transmission alignment along roadways at single-family residences nearest the alignment, as well as commercial, industrial, and open space areas.

Noise measurements were taken by AECOM noise specialists using sound level meters (SLMs) manufactured by Larson-Davis, Inc. (LD). ST noise measurements were made with one LD Model LxT SLM, and LT measurements with two LD Model 820 SLMs. The SLMs were programmed in "slow" response mode, and to record noise levels with A-weighting. All noise measurements were taken approximately 5 feet above ground level using stationary tripods. SLM calibration was field-checked before and after each measurement using LD Model CAL 200 calibrators. During the measurements, the weather was generally clear and dry, with winds ranging from 0 to 9 miles per hour, and temperatures ranging between 52 and 81 degrees Fahrenheit.

Noise measurement locations and observations are summarized in Table 2 and detailed in Appendix A. For purposes of this noise analysis, the ST locations will be considered representative locations of existing or future (based on current or proposed development) residential land uses for which corresponding noise impact assessment criteria (based on land use or zoning) would apply.

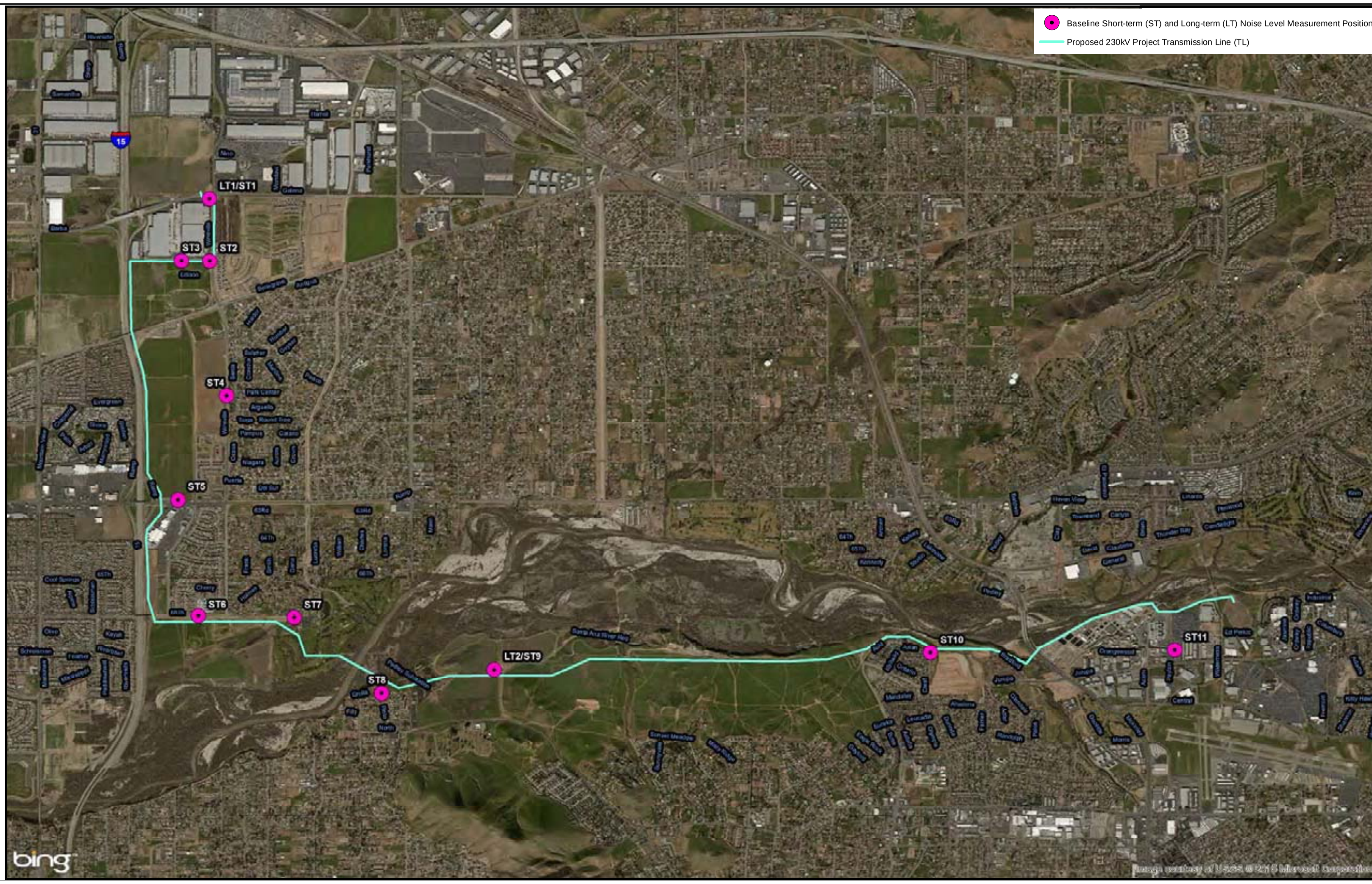
Table 2
Noise Measurement Locations

Site ID*	Location	Approximate Distance/ Direction from Project Alignment	Land Use	Dominant Noise Source
LT-1	Wineville Avenue /Canto-Galeano Ranch Road	110 feet/north	Commercial, trucking	Vehicle/truck traffic
LT-2	Hidden Valley County Park	212 feet/north	County park, open space	Vehicle traffic, off-road motorcycles
ST-1	Wineville Avenue /Canto Galeano	110 feet/north	Commercial, trucking	Vehicle/truck traffic
ST-2	Landon Drive @ Wineville Avenue	23/south	Commercial, trucking	Vehicle/truck traffic
ST-3	Landon Drive	28/south	Commercial, trucking	Vehicle/truck traffic
ST-4	Wineville Avenue @ Park Center	2,293 feet/east	Existing and proposed residential	Agricultural noise and vehicle traffic
ST-5	Park and Ride on Limonite Avenue @ I-15	490 feet/east	Commercial and open space	Vehicle/truck traffic
ST-6	68th Street @ Carnellian Street	214/north	Existing and proposed residential	Vehicle traffic
ST-7	68th Street @ Dana Avenue	430 feet/north	Existing residential and golf course	Vehicle traffic and aircraft flyovers
ST-8	Gruela Court @ Pinto Lane	425 feet/south	Existing residential and open space	Vehicle traffic and aircraft flyovers
ST-9	Hidden Valley Wildlife Area Access Road	212 feet/north	County park, open space	Strong winds, park goers voices
ST-10	Julian Drive @ Crest Avenue	168/south	Existing residential, open space	Vehicle traffic and aircraft flyovers
ST-11	Payton Street	1,330 feet/south	Industrial and open space	Vehicle traffic and aircraft flyovers

* The Site ID corresponds to noise measurement locations shown in Figure 3.

As shown in Table 2 and Figure 3, the current land uses at the measurement locations along the alignment from west to east (ST-1 to ST-11) include a commercial warehouse trucking district near I-15 including existing residential development; a golf course, Santa Ana River crossing and floodplain area, open park space and existing residential development; and an industrialized area.

Also shown in Figure 3 are the aforementioned entitled and under-construction developments, for which the baseline outdoor ambient sound levels will (for purposes of this analysis) be represented by the measured sound levels from the field survey as follows:



1500 0 1500 3000 Feet

Figure 3
Noise Measurement Locations

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1. D.R. Horton Homes (ST-4, due to its distance from I-15 and its position on the same northwest perimeter [Wineville Avenue and Bellegrave Avenue] of the currently built-out residential community that adjoins the southern edge of this development).
2. Lennar Homes/Rancho Del Sol (ST-4, for the same reasons as #1 above).
3. Lyon Homes (the average of ST-2 and ST-4, due to the former adjoining the development on its western edge, and the latter for the same reasons as #1 and #2 above).
4. Stratham Homes (the average of ST-1 and ST-2, since they both adjoin the development on its western edge).
5. Thoroughbred Farms Business Park (the average of ST-2 and ST-3, since they both adjoin the development on its northern edge).
6. APV 1 and 2 Homes (ST-4, since it adjoins the northeast corner of APV 2 and is north of APV 1 [but adjoins the same Wineville Avenue perimeter of the existing residential community immediately east]).
7. Vernola Marketplace Apartments (ST-5, since it shares the same distance to I-15 as does the eastern edge of the development [Pat’s Ranch Road]).
8. Riverbend Development (the average of ST-6 and ST-7, since these survey positions adjoin the northern edge of the development).

Ambient noise level measurements are summarized in Table 3 and detailed in Appendix A.

As shown in Table 3, ST ambient noise level measurements ranged from 47 to 68 dBA L_{eq} during the day and 36 to 71 dBA L_{eq} at night. LT ambient noise level measurements ranged from 70 dBA CNEL at LT-1 to 52 dBA CNEL at LT-2. Dominant noise sources were primarily from vehicle traffic on adjacent roadways and I-15 (including heavy trucks) and aircraft flyovers.

3.4 MEASUREMENT OF CORONA AUDIBLE NOISE

As part of satisfying the stated expectations of the Deficiency Report as quoted in Section 1.1, “*Provide noise level measurements at similar 230-kV transmission lines near the project area,*” outdoor ambient noise level measurements and documented observations of field conditions were performed at a non-Project site at various distances from an existing SCE 230kV

Table 3
Measured Existing Outdoor Ambient Noise Levels

Site ID*	Date (mm/dd/yy)	Start/Stop Time (hh:mm)	CNEL (dBA)	L_{eq} (dBA)	L_{max} (dBA)	L_{min} (dBA)	L_{10} (dBA)	L_{50} (dBA)	L_{90} (dBA)
LT-1	11/11/15 11/12/15	12:05/ 13:25	70	64	91	48	66	61	57
LT-2	11/11/15 11/12/15	14:40/ 15:45	52	45	67	29	46	41	39
ST-1D	11/12/15	13:10/13:25	68	63	72	52	66	61	57
ST-1N	11/12/15	14:35/14:50		61	73	48	63	56	51
ST-2D	11/12/15	12:45/13:00	77	66	81	51	70	60	53
ST-2N	11/12/15	02:10/02:25		71	81	46	57	50	49
ST-3D	11/12/15	12:25/12:40	65	62	84	42	62	49	44
ST-3N	11/12/15	01:50/02:05		57	79	44	55	51	49
ST-4D	11/12/15	12:00/12:15	68	68	96	43	61	54	49
ST-4N	11/12/15	01:25/01:40		47	60	41	49	45	43
ST-5D	11/12/15	11:20/11:35	64	60	73	48	63	58	53
ST-5N	11/12/15	01:00/01:15		56	68	45	60	52	48
ST-6D	11/12/15	15:10/15:25	67	67	84	48	68	60	55
ST-6N	11/12/15	00:35/00:50		50	66	36	52	43	40
ST-7D	11/12/15	13:55/14:10	48	47	66	34	49	40	37
ST-7N	11/12/15	00:10/00:25		36	43	34	38	36	35
ST-8D	11/12/15	14:35/14:50	54	53	71	33	54	39	36
ST-8N	11/11/15	23:30/23:45		43	51	39	45	43	41
ST-9D	11/11/15	15:05/15:20	61	47	61	33	48	42	38
ST-10D	11/11/15	16:55/17:10	57	52	68	41	55	45	43
ST-10N	11/11/15	22:55/23:10		49	59	44	51	48	46
ST-11D	11/11/15	16:25/16:40	58	55	72	44	57	48	46
ST-11N	11/11/15	22:30/22:45		50	69	45	51	47	46

* The Site ID corresponds to noise measurement locations shown in Figure 3.
** For short-term (ST) locations, CNEL values calculated from day and night measurement data, applying daytime measured value as the estimated evening noise level. For ST-9, daytime measurement value used day, evening and nighttime periods.

transmission line (location provided by SCE) that is currently in operation. Corona noise measurement locations are shown in Appendix A. The intent of the measurements was to measure audible corona noise, distinguished from background noise sources. A combination of three (3) concurrent ST measurements were conducted during the late afternoon (between 6:00 to 6:30 p.m.) on Saturday, November 21, 2015. Representing the AECOM field investigators' best efforts to measure and collect corona noise level data at distances of 50, 100 and 200 feet using available GPS tools and SCE-furnished information, the noise measurements were performed on Eucalyptus Road at distances of 56, 111, and 213 feet from the existing transmission line centerline traversing the road overhead.

Noise measurements were taken by AECOM noise specialists using sound level meters (SLMs) manufactured by Larson-Davis, Inc. (LD). ST noise measurements were made with two LD Model LxT SLMs and one LD Model 820 SLM. The SLMs were programmed to record A-weighted noise levels with a "slow" response, and the calibration was field-checked before and after the measurement using LD Model CAL200 calibrator. During the measurement, the weather was generally clear and dry, with average wind speeds ranging from 7 to 8 miles per hour, and the temperature was 75 degrees Fahrenheit.

Noise measurement locations and observations are summarized in Table 4 and detailed in Appendix A.

Table 4
Measurements of Corona Audible Noise (AN) from an Existing 230 kV Line

Site ID	Date (mm/dd/yy)	Start/Stop Time (hh:mm)	Distance from Existing 230kV Transmission Line (ft)	L_{eq} (dBA)	L_{min} (dBA)	L_5 (dBA)	L_{50} (dBA)
ST-01	11/21/2015	18:07 / 18:31	56	43.4	42.1	44.5	43.2
ST-02	11/21/2015	18:09 / 18:32	111	43.5	42.1	45.2	43.3
ST-03	11/21/2015	18:13 / 18:26	213	40.9	39.5	42.0	40.6

As shown in Table 4, the ST noise level measurements of the existing 230 kV transmission line ranged from 41 to 44 dBA L_{eq}. The dominant noise source during this measurement was the audible "crackle" and buzz of corona noise emanating from the elevated transmission line. Additional observed sound sources that contributed to the overall measured levels were frequent aircraft flyovers and possible substation noise to the north-northeast. In an effort to reduce the acoustical contribution of these other sound sources that contributed to the measured outdoor ambient sound environment, the metrics and statistical values reported in Table 4 are average levels calculated from the three lowest 1-minute intervals of the measurement. In other words, and assuming the corona noise was fairly constant (as suggested by all four values in Table 4 for each location staying within a 3 dBA range), usage of the lowest 1-minute intervals suggests that the influence of background noise (e.g., winds, distant traffic, etc.) would be least during those measured durations.

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4.0 REGULATORY FRAMEWORK

This section provides a summary of the applicable federal, state, and local noise regulations.

4.1 FEDERAL REGULATIONS

The federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise-sensitive" uses are prohibited from being sited adjacent to a highway or, alternately, that the developments are planned and constructed in such a manner that potential noise impacts are minimized. Federal noise policies and programs are developed by federal agencies of the U.S. Department of Transportation through its various operating agencies, i.e., the Federal Aviation Administration, the Federal Transit Administration (FTA), and the Federal Highway Administration (FHWA).

Currently, there are no AN control regulations that are specifically concerned with AN from power facilities. The U.S. Environmental Protection Agency has published guidelines relating to AN in general, which recommend that the L_{dn} be limited to 55 dBA outdoors and 45 dBA indoors (USEPA 1974).

4.2 STATE REGULATIONS

California Government Code, General Plan Noise Elements

California does not promulgate statewide standards for environmental noise, but California State Government Code Section 65302(f) requires each local jurisdiction to draft a Noise Element for their General Plan to establish acceptable noise limits for various land uses. The California Administrative Code provides guidelines for evaluating the compatibility of various land uses as a function of community noise exposure.

California Department of Transportation

The California Department of Transportation (Caltrans) provides vibration level thresholds for architectural and structural damage and human perception thresholds. The Project is not subject to Caltrans requirements; however, Caltrans provides vibration thresholds for reference. To assess the potential for structural damage associated with vibration from construction activities, the vibratory ground motion in the vicinity of an affected structure is measured in terms of ppv, typically in units of in/sec. Table 5 presents the vibration level thresholds for architectural and structural damage and human perception and annoyance.

Table 5
Human and Structural Response to Vibration

Effects on Structures and People	Peak Vibration Threshold (ppv) (in/sec)
Structural damage to commercial structures	6
Structural damage to residential buildings	2
Architectural damage	1.0
General threshold of human annoyance	0.1
General threshold of human perception	0.01

Source: Caltrans 2002

As shown in Table 5, structural damage occurs to various structures when vibration levels reach 2 to 6 in/sec ppv at the respective structures. One-half of the minimum of this threshold range (i.e., 1 in/sec ppv) is considered a safe criterion that would protect against structural damage. For its construction projects, Caltrans uses a vibration criterion of 0.2 in/sec ppv, except for pile driving and blasting activities.

California Environmental Quality Act of 1970

The California Environmental Quality Act (CEQA), Public Resources Code 21100 et seq., requires lead agencies to evaluate the environmental impact associated with a proposed project. CEQA requires that a local agency prepare an EIR on any project it proposes to approve that may have a significant effect on the environment. Technical reports such as this Report are used to develop noise sections of EIRs. CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Section 15064.7) provide thresholds of significance for noise.

California Public Utilities Commission

CPUC has sole and exclusive state jurisdiction over the siting and design of the proposed Project. Pursuant to CPUC General Order 131-D, Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the county and cities' regulations are not applicable as the county and cities do not have jurisdiction over the proposed Project. Accordingly, the following discussion of local regulations is provided for informational purposes only.

4.3 LOCAL REGULATIONS

The proposed Project alignment is located within four jurisdictions: Riverside County, and the cities of Riverside, Jurupa Valley, and Norco. Municipal policies, ordinances, and significance thresholds with respect to noise, applicable to the proposed Project, are included in the:

- County's General Plan Noise Element (Riverside County 2008),
- County's Municipal Code Noise Ordinance (Riverside County 2006),
- City of Riverside Municipal Code Noise Ordinance (City of Riverside 1996),
- City of Riverside General Plan Noise Element (City of Riverside 2007),
- City of Jurupa Valley Municipal Code Noise Ordinance (City of Jurupa Valley 2012), and
- City of Norco Municipal Code Noise Ordinance (City of Norco 2015).

County of Riverside

General Plan, Noise Element

The Noise Element of the Riverside County General Plan contains specific goals and policies for evaluating a project's compatibility with surrounding land uses (Riverside County 2008). The following goals and policies related to noise are relevant to the proposed Project:

Policy N 4.1: Prohibit facility-related noise, received by any sensitive use, from exceeding
45 dB-10-minute L_{eq} between 10:00 p.m. and 7:00 a.m. (nighttime)
65 dB-10-minute L_{eq} between 7:00 a.m. and 10:00 p.m. (daytime)

Policy N 4.2: Develop measures to control non-transportation noise impacts.

Policy N 4.3: Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed, and ensure that the recommended mitigation measures are implemented.

Policy N 12.1: Minimize the impacts of construction noise on adjacent uses within acceptable practices.

Policy N 12.2: Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

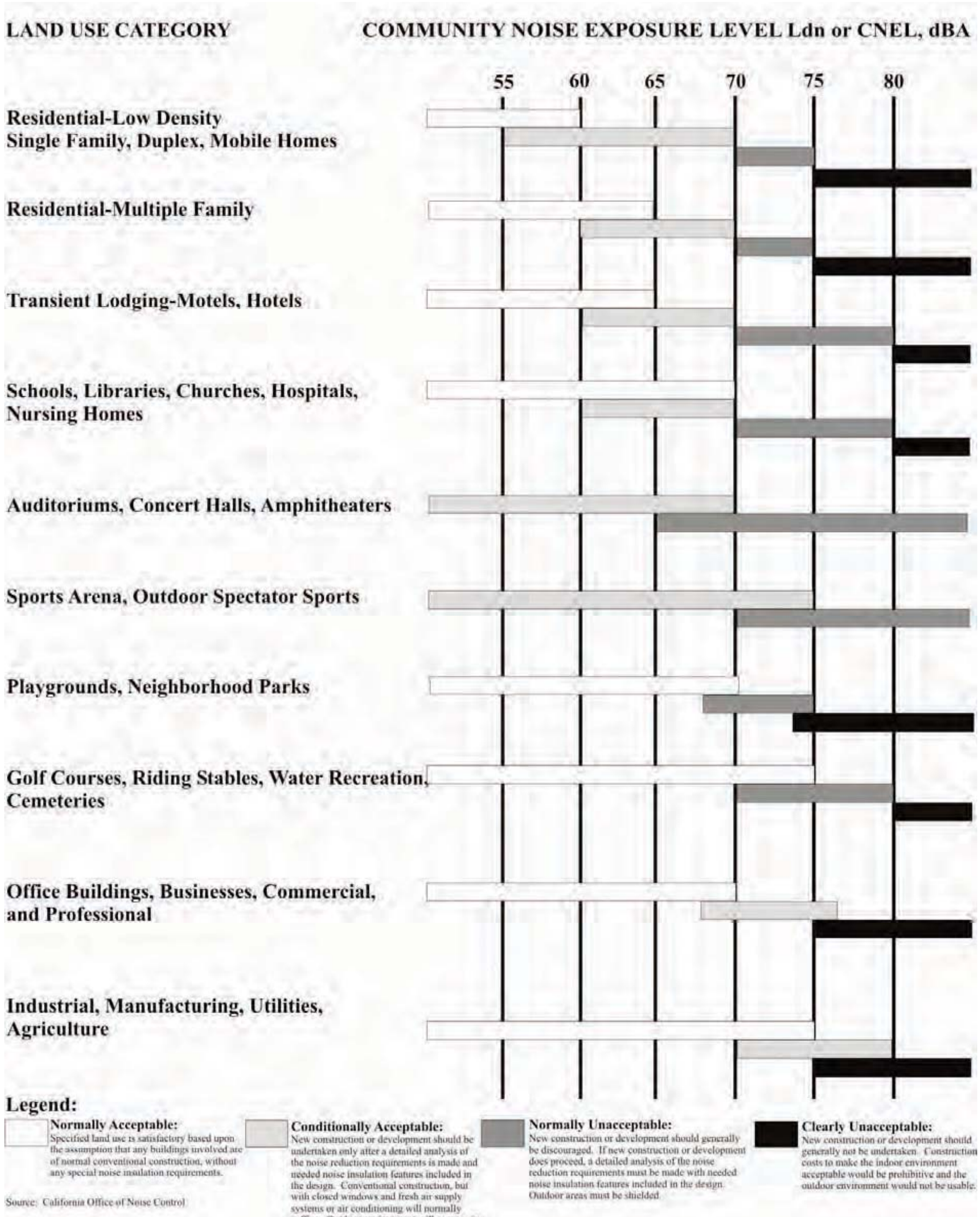
Policy N 12.4: Require that all construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

Riverside County adheres to California state laws with regard to noise levels (i.e., the County of Riverside General Plan, Chapter 7 Noise Element. Table N-1 "Land Use Compatibility for Community Noise Exposure" (Table 6) is the same as the State's Community Noise Exposure chart). Single-family residential land uses are considered acceptable for noise levels up to 60 dBA CNEL.

Noise Ordinance

Riverside County regulates noise in accordance with Chapter 9.52, Noise Regulations of the Riverside County Municipal Code (Noise Ordinance 847) (Riverside County 2006). Section 9.52.030 of the Municipal Code defines a sensitive receptor as a land use that is sensitive to noise including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries, or public libraries. Section 9.52.040 of the Municipal Code states that maximum noise levels from stationary noise sources at the property line of a sensitive receptor (medium density residential and low density residential in the proposed Project area) are to remain below 45 dB during nighttime hours (10:00 p.m. to 7:00 a.m.) and are not to exceed 55 dB during daytime hours (7:00 a.m. to 10:00 p.m.). Section 9.52.020[I] states that sound emanating from private construction projects located within one-quarter mile from an inhabited dwelling is exempt from the provisions of Chapter 9.52, if 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.

Table 6
Riverside County Land Use Compatibility for Community Noise Exposure



Under Ordinance No. 847, the County could consider providing a construction-related exception to the county sound level standards, if an application for a construction-related exception has been filed and approved by the County's Director of Building and Safety. According to Ordinance 847, an exception application shall not be approved unless: *the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decision making body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.* Ordinance 847 exempts facilities and capital improvement projects of a governmental agency.

City of Riverside

<u>General Plan, Noise Element</u>

The City noise/land use compatibility guidelines are outlined in the City's General Plan Noise Element Figure N–10 Noise/Land Use Compatibility Criteria (Table 7), which show a range of noise standards for various land use categories in terms of dBA CNEL. Depending on the ambient environment of a particular community, these basic guidelines may be tailored to reflect existing noise and land use characteristics. Noise levels occurring during nighttime hours are weighted more heavily than during the daytime. Single-family residential land uses are considered acceptable for noise levels up to 60 dBA CNEL.

<u>Noise Ordinance</u>

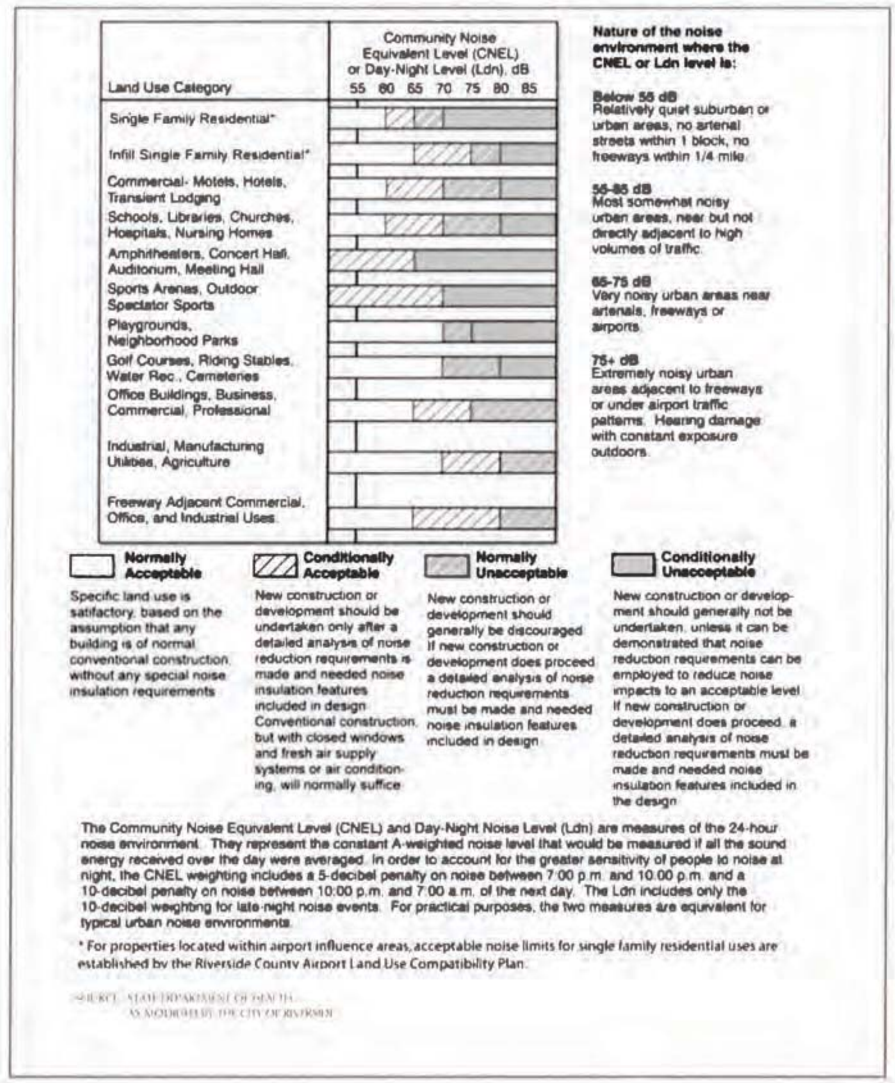
The City of Riverside's Noise Ordinance Chapter 7.35 (City of Riverside 1996) prohibits any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity including permitting any noise disturbance that is:

a. Plainly audible across property boundaries;

b. Plainly audible through partitions common to two residences within a building;

c. Plainly audible at a distance of 50 feet in any direction from the source of music or sound between the hours of 7:00 a.m. and 10:00 p.m.; or

Table 7
City of Riverside Noise/Land Use Compatibility Criteria



d. Plainly audible at a distance of 25 feet in any direction from the source of music or sound between the hours of 10:00 p.m. and 7:00 a.m.

The City’s noise ordinance does not provide noise level limits.

The City's noise ordinance limits construction activities to the hours of 7 a.m. to 7 p.m. on weekdays, and to 8 a.m. to 5 p.m. on Saturdays. Construction is not allowed on Sundays and Federal Holidays. Provisions of this noise ordinance do not apply to construction, maintenance and repair operations, which are deemed necessary to serve the best interest of the public and which are conducted by public agencies and/or utilities or their contractors (City of Riverside 1996).

City of Jurupa Valley

The City of Jurupa Valley regulates noise in accordance with the Jurupa Valley Municipal Code Noise Ordinance, Chapter 11.10 Noise Regulations (City of Jurupa Valley 2012), which is intended to establish city-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are established. Sound emanating from the following sources applicable to the proposed Project is exempt from the provisions of this chapter:

- Facilities owned or operated by of/for a governmental agency;
- Capital improvement projects of a governmental agency.
- Private construction projects located one-quarter of a mile or more from an inhabited dwelling;
- Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:
    - Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and
    - Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May;

The City's noise ordinance provides noise level limits; the listed exterior sound level limits for residential classifications 55 dBA (daytime)/45 dBA (night time) respectively (City of Jurupa Valley 2012).

City of Norco

The City of Norco regulates noise in accordance with the City of Norco Municipal Code, Chapter 9.07 Noise Regulations (City of Norco 2015). Private construction projects involving no more than one unit located within one-quarter of a mile from an inhabited dwelling is exempt provided, that construction does not occur between the hours of 7:00 p.m. and 6:30 a.m., Monday through Friday and 7:00 p.m. and 8:00 a.m., on Saturday and Sunday, unless specified by permit.

Section 15.30.020 provides hours of construction activity. Construction activity, including equipment start-up and use, and the loading, unloading and handling of materials, shall not commence before 6:30 a.m., or continue beyond 7 p.m., on weekdays. No construction activity for residential development projects that consist of more than one unit is permitted on Saturdays, Sundays, or national holidays unless otherwise permitted with conditions on entitlements.

The City's noise ordinance provides noise level limits; the listed exterior sound level limits for residential classifications 55 dBA (daytime)/45 dBA (night time) respectively (City of Norco 2015.

4.4 SIGNIFICANCE THRESHOLD CRITERIA

Noise levels attributed to Project construction and operation, or their acoustical contribution to a future outdoor ambient sound environment, must comply with relevant applicable federal, state, or local standards or regulations. However, consideration is given to the applicability of local ordinances, where the project is governed by a CPUC license, as discussed in Section 4.2 State Regulations, California Public Utilities Commission.

The increase in noise levels above the existing ambient level as a result of the Project also needs to be considered. A change in noise level due to a new noise source can create an impact on people. Outside controlled laboratory conditions, noise level changes below 3 dBA are not detectable by the human ear. Although individuals' reactions to changes in noise vary, empirical studies have shown people begin to notice changes in environmental noise levels of around 5 dBA (USEPA 1974). Thus, average changes in noise levels less than 5 dBA cannot be considered as producing a potentially significant adverse impact because changes of that magnitude are imperceptible by the vast majority of persons. For changes in noise levels above 5 dBA, it is difficult to quantify the impact beyond the determination that, the greater the noise level change, the greater the impact. A judgment commonly used in community noise impact analyses associates long-term noise increases of 5 to 10 dBA with "some impact."

Noise level increases of more than 10 dBA are generally considered significant (USEPA 1974). In the case of short-term noise increases, such as those from construction, the 10 dBA threshold between "less significant" and "significant" impact is often replaced with a criterion of 15 dBA (USEPA 1974). These noise-averaged thresholds are to be lowered when the noise level fluctuates, or the noise has an irritating character with considerable high frequency energy, or if it is accompanied by subsonic vibration. In these cases, the impact must be individually estimated (USEPA 1974).

The assessment of significant noise impacts is weighed in consideration of CEQA requirements. For this discussion, CEQA describes a significant effect as one that would create a substantial, or potentially substantial, adverse change in the noise conditions of the environment in the area. Appendix G of the CEQA guidelines defines the criteria and areas of concern regarding a project's potential impact on noise-sensitive receptors by considering if a project would result in:

a) 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.

The County and City of Riverside General Plan Noise Elements provide that single-family residential land uses are considered acceptable for noise levels up to 60 dBA CNEL.

The City of Riverside noise ordinance limits construction activities to the hours of 7 a.m. to 7 p.m. on weekdays, and to 8 a.m. to 5 p.m. on Saturdays. The City of Norco noise ordinance limits construction activities to the hours of 6:30 a.m. to 7 p.m. on weekdays. The County and the City of Jurupa Valley noise ordinances exempt construction noise from private construction projects located within one-quarter mile from an inhabited dwelling, and within one-quarter mile from an inhabited dwelling, provided construction occurs between the hours of 6 a.m. to 6 p.m. during the months of June through September, and 7 a.m. to 6 p.m. during the months of October through May.

Riverside County and the Cities of Jurupa Valley and Norco noise ordinances limit maximum noise levels from stationary noise sources at the property line of a sensitive receptor (medium density residential and low density residential in the proposed Project area) are to remain below 45 dB during nighttime hours (10:00 p.m. to 7:00 a.m.) and are not to exceed 55 dB during daytime hours (7:00 a.m. to 10:00 p.m.). The City of Riverside's noise ordinance prohibits any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity including permitting any noise disturbance that is: plainly audible across property boundaries; plainly audible through partitions common to two residences within a building; plainly audible at a distance of 50 feet in any direction from the source of music or sound between the hours of 7:00 a.m. and 10:00 p.m.; or plainly audible at a distance of 25 feet in any direction from the source of music or sound between the hours of 10:00 p.m. and 7:00 a.m.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Excessive vibration levels are defined as exceeding vibration standards provided by FTA and Caltrans (Table 2). Typically, a vibration level of 0.1 in/sec ppv is the threshold of human annoyance, and 0.2 ppv is the threshold of risk of structural damage. At 50 feet, construction equipment is typically below the thresholds of human annoyance and structural damage (FTA 2006), except for rock blasting and impact pile driving activities which generate the highest vibration levels.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Operational noise is typically considered permanent, i.e., for the duration of the operation of the constructed facility. A significant permanent increase is defined as a direct Project-related permanent ambient increase of 5 dBA or greater. An increase of 3 dBA is a barely perceptible increase, and an increase of less than 5 dBA cannot be considered as producing a potentially significant adverse impact because changes of that magnitude are imperceptible by the vast majority of persons.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Construction noise is typically considered temporary and short term (i.e., its effect on the environment ceases upon conclusion of construction activities). A substantial temporary increase in ambient noise levels is defined as a direct Project-related increase of 10 dBA L_{eq} or greater, based on the noise standard that a 10 dBA increase is perceived by the human ear as twice as loud (FTA 2006).

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two 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?

There are public airports within 2 miles of the Project area, the closest major airport is Riverside Municipal Airport. The airport noise is 65 dBA CNEL for a distance of approximately 10,000 feet along and away from the runway and 55 dBA to a distance of approximately 20,000 feet from the center of the airport towards the northwest (approximately 15,000 feet towards the southeast) (City of Riverside 2007), and surrounding area ambient noise levels are 55 to 60 dBA for distances of several thousand feet from the centerline references of these transportation areas. Therefore, noise from the proposed transmission line would not be higher than existing airport and highway noise. Construction workers would not be exposed to excessive noise from the airport. The long-term operational noise from the transmission line would not be higher than existing ambient noise sources surrounding the airport and roads. The noise may be higher due to short-term construction work activities.

Being a power line project, the proposed Project would not result in the construction of occupied structures that would result in an increase in the number of people residing or working in proximity to the Riverside Municipal Airport. Therefore, the proposed Project would not result in people residing or working in the area being exposed to excessive noise levels.

> f) 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?

There are no private airstrips in the Project area; therefore, this would be no impact.

4.5 EIR AND REPORT IMPACT CRITERIA CONSISTENCY

As stated in Section 1.1, one of the purposes of this Report is to update the current noise analysis contained in the EIR, dated October 23, 2012, and as provided on the CPUC website. For applicable noise regulations and standards with respect to impact assessment and significance determination, the EIR considered:

- U.S. Environmental Protection Agency guidelines relating to AN, which recommend that the L_{dn} be limited to 55 dBA outdoors and 45 dBA indoors.
- California Administrative Code guidelines for evaluating the compatibility of various land uses as a function of community noise exposure.
- Riverside County General Plan, Noise Element, Land Use Compatibility for Community Noise Exposure Table. Single-family residential land uses are considered “normally acceptable” for noise levels up to 60 dBA CNEL.
- County Ordinance No. 847 providing a construction-related exception to the county sound level standards, if an application for a construction-related exception has been filed and approved by the County's Director of Building and Safety. Ordinance 847 exempts facilities and capital improvement projects of a governmental agency.

- City noise/land use compatibility guidelines, outlined in the City's General Plan Noise Element Noise/Land Use Compatibility Criteria. Single-family residential land uses are considered acceptable for noise levels up to 60 dBA CNEL.
- The City of Riverside's Noise Ordinance limiting construction activities to the hours of 7 a.m. to 7 p.m. on weekdays, and to 8 a.m. to 5 p.m. on Saturdays.
- The CEQA Guidelines provide thresholds of significance for noise.
- A significant permanent increase is defined as a direct Project-related permanent ambient increase of 5 dBA CNEL or greater.
- A substantial temporary increase in ambient noise levels is defined as a direct Project-related increase of 10 dBA L_{eq} or greater.

To update the applicable noise regulations of the EIR noise section, the Report considered the regulations above contained in the EIR, and also considered:

- Caltrans vibration level thresholds for architectural and structural damage and human perception thresholds.
- CPUC sole and exclusive state jurisdiction over the siting and design of the proposed Project, pursuant to CPUC General Order 131-D, Section XIV.B.
- The City of Norco noise ordinance limits construction activities to the hours of 6:30 a.m. to 7 p.m. on weekdays, and exterior sound level limits for residential classifications 55 dBA (daytime)/45 dBA (night time).
- The County and the City of Jurupa Valley noise ordinances exempting construction noise from private construction projects located within one-quarter mile from an inhabited dwelling, and within one-quarter mile from an inhabited dwelling, provided construction occurs exemption from otherwise applicable daytime and nighttime thresholds to between the hours of 6 a.m. to 6 p.m. during the months of June through September, and 7 a.m. to 6 p.m. during the months of October through May.
- County and the Cities of Jurupa Valley and Norco noise ordinances limiting maximum noise levels from stationary noise sources at the property line of a sensitive receptor to below 45 dB during nighttime hours (10:00 p.m. to 7:00 a.m.) and are not to exceed 55 dB during daytime hours (7:00 a.m. to 10:00 p.m.).

In summary, and as the subsequent Impact Analysis section illustrates, this Report assesses potential noise impacts in a manner that emulates what is presented in the EIR, with consideration of additional regulations and standards reflecting what are relevant and applicable to the Project as of this writing.

5.0 IMPACT ANALYSIS

This section addresses Project-related noise and vibration impacts that would occur during Project construction and operation.

5.1 CONSTRUCTION NOISE

Methodology

Construction noise is considered temporary and short term in duration. Construction noise at its source varies depending on construction activities and duration, and the type and usage of equipment involved. Noise impacts from construction are dependent on the construction noise levels generated, the timing and duration of the construction activities, proximity to sensitive receptors, and noise regulations and standards. Construction equipment can be stationary or mobile. Stationary equipment operates in one location for various periods of time with fixed-power operation, such as pumps, generators, and compressors, or a variable noise operation, such as pile drivers, rock drills, and pavement breakers. Mobile equipment moves around the construction site such as bulldozers, graders, and loaders (FTA 2006).

Heavy construction equipment typically operates for short periods at full power followed by extended periods of operation at lower power, idling, or powered-off conditions. Typically, site preparation involves demolition, grading, compacting, and excavating, which would include the use of backhoes, bulldozers, loaders, excavation equipment (e.g., graders and scrapers), pile drivers, and compaction equipment. Finishing activities may include the use of pneumatic hand tools, scrapers, concrete trucks, vibrators, and haul trucks. Typical maximum noise levels generated by typical pieces of construction equipment are listed in Table 8.

As shown in Table 8, maximum noise levels range from 70 to 95 dBA L_{max}, depending upon the piece of equipment operating (FTA 2006). In typical construction projects, grading and impact activities typically generate the highest noise levels. Grading involves the largest heaviest equipment and typically includes bulldozers, excavators, dump trucks, front-end loaders, and graders with maximum noise levels range from 80 to 85 dBA L_{max}. Impact equipment includes pile drivers, rock drills, pavement breakers, concrete crushers, and industrial/concrete saws with maximum noise levels range from 90 to 95 dBA L_{max}. Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some phases would have higher continuous noise levels than others, and some have high-impact noise levels.

Table 8
Construction Equipment Noise Levels

Equipment	Noise Level (dBA L_{max}) at 50 Feet
Auger Drill Rig	85
Backhoe	80
Blasting	94
Chain Saw	85
Clam Shovel	93
Compactor (ground)	80
Compressor (air)	80
Concrete Batch Plant*	80
Concrete Mixer Truck	85
Concrete Pump	82
Concrete Saw	90
Crane (mobile or stationary)	85
Dozer	85
Dump Truck	84
Excavator	85
Front End Loader	80
Generator (25 KVA or less)	70
Generator (more than 25 KVA)	82
Grader	85
Hydra Break Ram	90
Impact Pile Driver (diesel or drop)	95
Insitu Soil Sampling Rig	84
Jackhammer	85
Mounted Impact Hammer (hoe ram)	90
Paver	85
Pneumatic Tools	85
Pumps	77
Rock Drill	85
Scraper	85
Tractor	84
Vacuum Excavator (vac-truck)	85
Vibratory Concrete Mixer	80
Vibratory Pile Driver	95

Source: Thalheimer 2000, *FTA 2006, KVA = kilovolt amps

Typical construction projects, with equipment moving from one point to another, work breaks, and idle time, have hourly average noise levels (L_{eq}) that are lower than loud short-term, or instantaneous, peak noise events shown in Table 8. The L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase (FTA 2006). Therefore, typically, hourly average noise levels would be approximately 75 to 80 dBA L_{eq} at 50 feet from the center of the non-impact construction activities area, with 90 dBA L_{eq} at 50 feet for impact equipment. Noise levels of other activities would be less. Noise levels from construction activities would attenuate with distance at a rate of 6 dBA per doubling of distance over acoustically hard sites, such as streets and parking lots. Intervening structures and/or topography would further attenuate noise levels. These factors generally limit the distance construction noise travels and ensure noise impacts from construction are localized.

Anticipated Project Construction Activities

In general, construction of the transmission line would follow a sequence of operations including right-of-way acquisition, access road identification, site clearing, construction staging, foundation installation, assembly and erection of structures, clearing areas, grounding installation (including ground rods and tying grounding between poles), and cleanup and site reclamation. Various phases of construction may occur at the same time at different locations throughout the construction process, requiring several construction crews operating simultaneously in different locations.

The construction, operation, and maintenance of the proposed transmission line would require that heavy vehicles access structure sites along the right-of-way. Access would be acquired through the proposed line route. In addition, spur roads may be utilized to minimize disturbances. Staging areas and pole construction will be sited inside the right-of-way.

Installation of foundations (drilled shafts, drilled piers, caissons and/or direct embedment) would require appropriate drilling equipment. Trucks with augers, cranes, bucket trucks, material trucks, and ready mix trucks are some typical equipment that would be used for construction of foundations. Foundations will be excavated with an auger. Various types of foundations would be used depending on structure type and soil conditions.

After the structures are erected, new insulators and hardware would be installed to each structure. The structures would be rigged with insulator strings at each ground wire and position conductor. Installation of all required structure grounding would be completed promptly following structure erection.

Modeling

Because several construction activities are expected and could occur at multiple locations along the Project alignment, Project construction noise was predicted at the representative nearby noise-sensitive receivers with a technique based on the "general assessment" methodology as appearing in Chapter 12 of the FTA's *Transit Noise and Vibration Impact Assessment* (FTA 2006) guidance report. In summary, this technique presumes the two loudest pieces of equipment associated with an activity are operating at full power and located at the geographic center of a construction area or zone. These geographic centers would be collinear with the Project alignment. Consistent with the high end of value ranges for reference construction noise levels at a distance of fifty feet as appearing in the EIR, 83 dBA L_{eq} was estimated as an average reference sound pressure level for all construction activities during daytime hours. Sound propagation between construction noise sources associated with this reference sound level and the representative receivers was estimated with an Excel spreadsheet model that incorporates algorithms and data based on International Organization for Standardization (ISO) 9613-2 standards, accounting for geometric divergence and acoustical absorption from air and ground effects.

While the Project anticipates coordinating construction activities to occur during daytime hours so as to avoid noise impacts, some specific construction activities or processes (e.g., concrete pours and/or curing) may need to continue into or otherwise occur during nighttime periods. For such a potential nighttime construction noise scenario, this analysis assumes that the two loudest equipment would be an operating light tower with a 20 kW generator, rated at 71 dBA at 23 feet (4-way rentals 2015) and equipment conducting a concrete pour process: 70 dBA at 82 feet (NSW 2009). Estimation of sound propagation to representative receivers would use the same aforementioned algorithms and data based on ISO 9613-2 information.

Impact Analysis

Project noise analysis is based on Project construction activities occurring separately (and not concurrently) at a given location. Project construction activities would be closest to existing and proposed residences at locations ST-4, ST-5, ST-6, ST-7, ST-8, and ST-10, as shown on Figure 3, and distance identified in Table 2. In addition, construction noise would be generated off-site by Project construction-related vehicle traffic trips to and from the job site on local roadways, including daily worker commute vehicle trips, and by heavy truck trips from construction equipment and materials deliveries.

<u>Construction Impact Summary</u>

Noise Standards

Project construction noise impacts would be significant if the Project would exceed the County’s/Cities’ applicable noise ordinance construction standards. The City of Riverside noise ordinance limits construction activities to the hours of 7 a.m. to 7 p.m. on weekdays, and to 8 a.m. to 5 p.m. on Saturdays.

The County and the City of Jurupa Valley noise ordinances exempt construction between the hours of 6 a.m. to 6 p.m. during the months of June through September, and 7 a.m. to 6 p.m. during the months of October through May. External to these time periods, noise limits with respect to non-transportation noise sources would apply and are described in Section 4.3.

Project construction noise would be localized at the specific areas of construction activity and generally anticipated to occur from 7 a.m. to 7 p.m. Monday through Saturday, during either the allowable construction hours (i.e., within 7 a.m. to 7 p.m.) or similar time periods when construction activity noise is exempted per the applicable County's/Cities noise ordinances. In addition, the County's/Cities noise ordinances do not provide a construction noise level limit. Therefore, if Project construction activity occurs during these allowable times, or generates noise within the allowable exemption timeframes, this would be a **less than significant impact**.

However, in the event construction activities are necessary on days or hours outside of what is specified by local ordinance (for example, if existing lines must be taken out of service for the work to be performed safely and the line outage must be taken at night for system reliability reasons, or if construction needs require continuous work), then this would be a potentially significant impact and applicable noise reduction measures discussed in Section 6 would be considered for feasibility during the time of Project construction. With respect to identified representative receivers, Table 9 shows where these potentially significant impacts may occur on the basis of the assumed nighttime construction noise emission of a light tower and concrete pour process.

Ambient Noise Levels

As shown in Table 10, estimated daytime Project construction noise level calculated at each of the representative receptors was logarithmically added to the measured existing daytime ambient noise level that is either co-located with or considered representative of, as described in Section 3.3, the baseline sound environments at those representative receptors. These log-summed ambient-plus-construction noise levels (aka, "future ambient") were then arithmetically compared to the measured existing ambient noise levels to determine the net ambient noise level increment at each representative receptor due to construction noise. This net increase in dBA was then compared to the relative threshold for a substantial temporary ambient noise level increment of 10 dBA L_{eq} or greater, also shown in Table 10.

Table 9
Predicted Nighttime Project Construction Noise Levels

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Apparent City Jurisdiction	Distance (ft)	Predicted Noise from Light Tower and Concrete Pour (dBA, L_{eq})	Potential Impact? (>45 dBA L_{eq} ambient increment)
ST-1N (Stratham[1])	Jurupa Valley	50	74	**Yes**
ST-2N (Stratham[2], Lyon[1])	Jurupa Valley	50	74	**Yes**
ST-3N (Thoroughbred[3])	Jurupa Valley	50	74	**Yes**
ST-4N (DR Horton[4])	Jurupa Valley	3,500	29	No
ST-4N (Lennar[5], Lyon[8])	Jurupa Valley	2,000	35	No
ST-4N (APV1[6], APV2[6])	Jurupa Valley	1,750	37	No
ST-5N (APV2[7])	Jurupa Valley	1,500	38	No
ST-5N (Vernola[1,2])	Jurupa Valley	50	74	**Yes**
ST-6N (Riverbend[9])	Jurupa Valley	50	74	**Yes**
ST-7N (Riverbend[9])	Jurupa Valley	50	74	**Yes**
ST-8N[10]	Norco	425	50	**Yes**
ST-9N[11]	Jurupa Valley	212	57	**Yes**
ST-10N[12]	Riverside	168	59	No**
ST-11N[13]	Riverside	1,330	40	No**

N = daytime
Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
** City of Riverside, Section 7.35.020.F of the noise ordinance exempts construction activity "conducted by public agencies and/or utility companies or their contractors which are deemed necessary to serve the best interests of the public"
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] as close as approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

Table 10
Daytime Project Construction Noise, Ambient Increase

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Measured Existing Daytime Ambient Sound Level at ASP (dBA, L_{eq})	Predicted Construction Noise at Representative Receptor Location (dBA, L_{eq})	Future Ambient (Log-sum of Existing Ambient and Predicted Construction Noise; dBA, L_{eq})	Increase over Existing Ambient due to Construction Noise Contribution (dBA, L_{eq})	Impact? (>10 dBA L_{eq} ambient increment)
ST-1D (Stratham[1])	63	83	83	20	**Yes**
ST-2D (Stratham[2], Lyon[1])	66	83	83	17	**Yes**
ST-3D (Thoroughbred[3])	62	83	83	21	**Yes**
ST-4D (DR Horton[4])	68	38	68	0	No
ST-4D (Lennar[5], Lyon[8])	68	44	68	0	No
ST-4D (APV1[6], APV2[6])	68	45	68	0	No
ST-5D (APV2[7])	60	47	68	0	No
ST-5D (Vernola[1,2])	60	83	62	2	No
ST-6D (Riverbend[9])	67	83	69	2	No
ST-7D (Riverbend[9])	47	83	59	12	**Yes**
ST-8D[10]	53	59	60	7	No
ST-9D[11]	47	65	65	18	**Yes**
ST-10D[12]	52	68	68	16	**Yes**
ST-11D[13]	55	48	56	1	No

D = daytime
Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] as close as approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

As shown in Table 10, estimated daytime Project construction noise levels would result in substantial predicted increases in ambient noise levels during the daytime at locations ST-1D, ST-2D, ST-3D, ST-7D, ST-9D, and ST-10D. Therefore, this would be a **potentially significant impact**. At these locations, applicable noise reduction measures would be considered for feasibility during the time of Project construction, as discussed in Section 6.

According to the EIR, and as assumed by this noise analysis, in order to minimize ground disturbance, SCE plans to use light duty helicopters (i.e., Hughes 500-E) to efficiently and rapidly pull light-weight sock lines from structure to structure during conductor stringing. This is a helicopter commonly used for aerial tours in parks and other scenic areas. During stringing activities, helicopters would generate intermittent noise levels of approximately 80 dBA at 200 feet. Helicopters would operate for a short time at any given location. Because the Proposed Project area is in proximity to approaches to the Riverside Municipal Airport, construction helicopter flights would enter the Project area immediately and not pass over residential areas during Project ingress and egress.

The proposed 230 kV transmission line would also traverse the City of Riverside's undeveloped Hole Lake and Savi Ranch park sites, various trails including the Santa Ana River Trail, and the Hidden Valley Wildlife Area. Construction activities would result in noise that may disrupt recreational and/or open space areas. During construction, ground work would be required at each structure location as well as along select roadways between the locations. These impacts would be temporary and of short duration, lasting only as long as required to complete the activity in a given location. Depending on the activity (structure erection, transmission line stringing, etc.), the duration of construction activities at any one location along the right-of-way would generally range from a few minutes to a few days and would not result in a significant impact to recreationists.

As shown in Table 11, estimated nighttime Project construction noise levels would result in substantial predicted increases in ambient noise levels at representative locations ST-1N, ST-3N, ST-5N (Vernola), ST-6N, ST-7N, and ST-9N. Therefore, this would be a **potentially significant impact**. At these locations, applicable noise reduction measures would be considered for feasibility during the time of Project construction, as discussed in Section 6.

Construction Noise Level Contours

Figures 5A through G display predicted daytime Project construction noise levels as iso-pleths (a.k.a., noise contours) radiating out from the Project alignment, superimposed on aerial imagery of the Project vicinity. Figure 4 provides a guide for each Figure 5A-G location along the entire alignment, and includes the construction contours, as well as the operation noise level contours (to be discussed after construction). These contours represent daytime Project construction noise, which allow the reader to see where the extent of construction noise (at a certain L_{eq}) is expected to occur; hence, the contours do not represent a single moment in time but the aggregate of potential noise levels as the construction activity occurs with its acoustical "center" located on the Project transmission line alignment.

Table 11
Nighttime Project Construction Noise, Ambient Increase

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Measured Existing Nighttime Ambient Sound Level at ASP (dBA, L_{eq})	Predicted Nighttime Construction Noise (Light Tower and Concrete Pour; dBA, L_{eq})	Future Ambient (Log-sum of Existing Ambient and Predicted Nighttime Construction Noise; dBA, L_{eq})	Increase over Existing Ambient due to Nighttime Construction Noise Contribution (dBA, L_{eq})	Impact? (>10 dBA L_{eq} ambient increment)
ST-1N (Stratham[1])	61	74	75	14	**Yes**
ST-2N (Stratham[2], Lyon[1])	71	74	76	5	No
ST-3N (Thoroughbred[3])	57	74	74	17	**Yes**
ST-4N (DR Horton[4])	47	29	47	0	No
ST-4N (Lennar[5], Lyon[8])	47	35	47	0	No
ST-4N (APV1[6], APV2[6])	47	37	47	0	No
ST-5N (APV2[7])	56	38	56	0	No
ST-5N (Vernola[1,2])	56	74	74	18	**Yes**
ST-6N (Riverbend[9])	50	74	74	24	**Yes**
ST-7N (Riverbend[9])	36	74	74	38	**Yes**
ST-8N[10]	43	50	51	8	No
ST-9N[11]	42**	57	57	15	**Yes**
ST-10N[12]	49	59	59	10	No
ST-11N[13]	50	40	50	0	No

N = daytime
Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
** assumed to be 5 dBA less than daytime measurement
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] as close as approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

5.2 VIBRATION

Potential vibration impacts may occur from Project construction activities, including pavement demolition, site excavation and surface grading, and construction. Although it is possible for vibrations from construction projects to cause building damage, the vibrations from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings (FTA 2006). Groundborne vibration generated by construction projects is usually highest during pile driving, soil compacting, jackhammering, and demolition-related activities. Table 12 shows typical vibration levels for various pieces of construction equipment that generate high vibration levels (FTA 2006).

Table 12
Construction Equipment Vibration Levels

Equipment		**PPV at 25 Feet (in/sec)**
Pile Driver (impact)	Upper range	1.518
	Typical	0.644
Pile Driver (sonic)	Upper range	0.734
	Typical	0.170
Hydromill (slurry wall)	Soil	0.008
	Rock	0.017
Clam Shovel Drop (slurry wall)		0.202
Vibratory Roller		0.210
Hoe Ram		0.089
Large Bulldozer		0.089
Caisson Drilling		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003

Source: FTA 2006

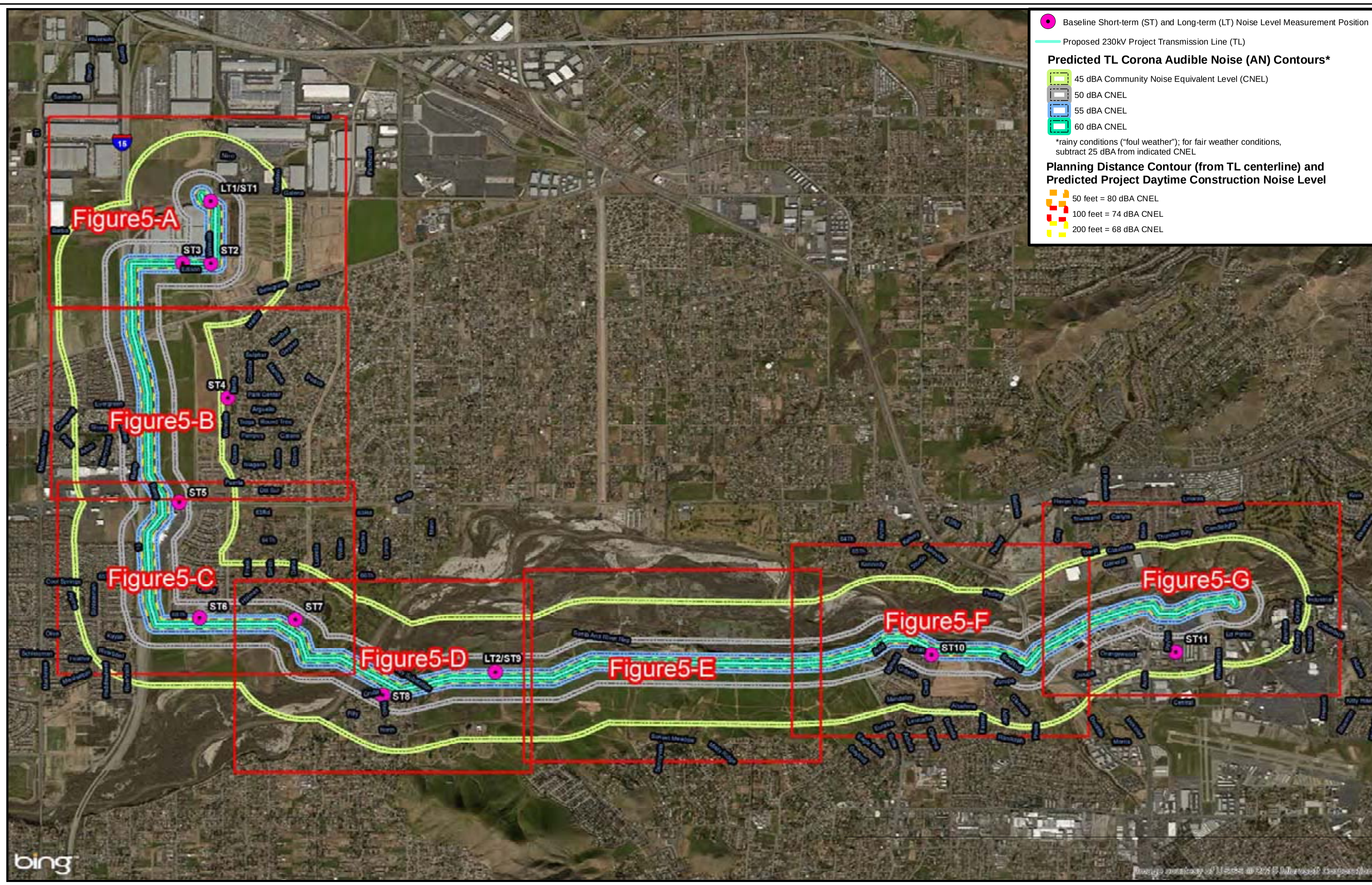


Figure 4
Project Construction and Corona Noise Contours Overview

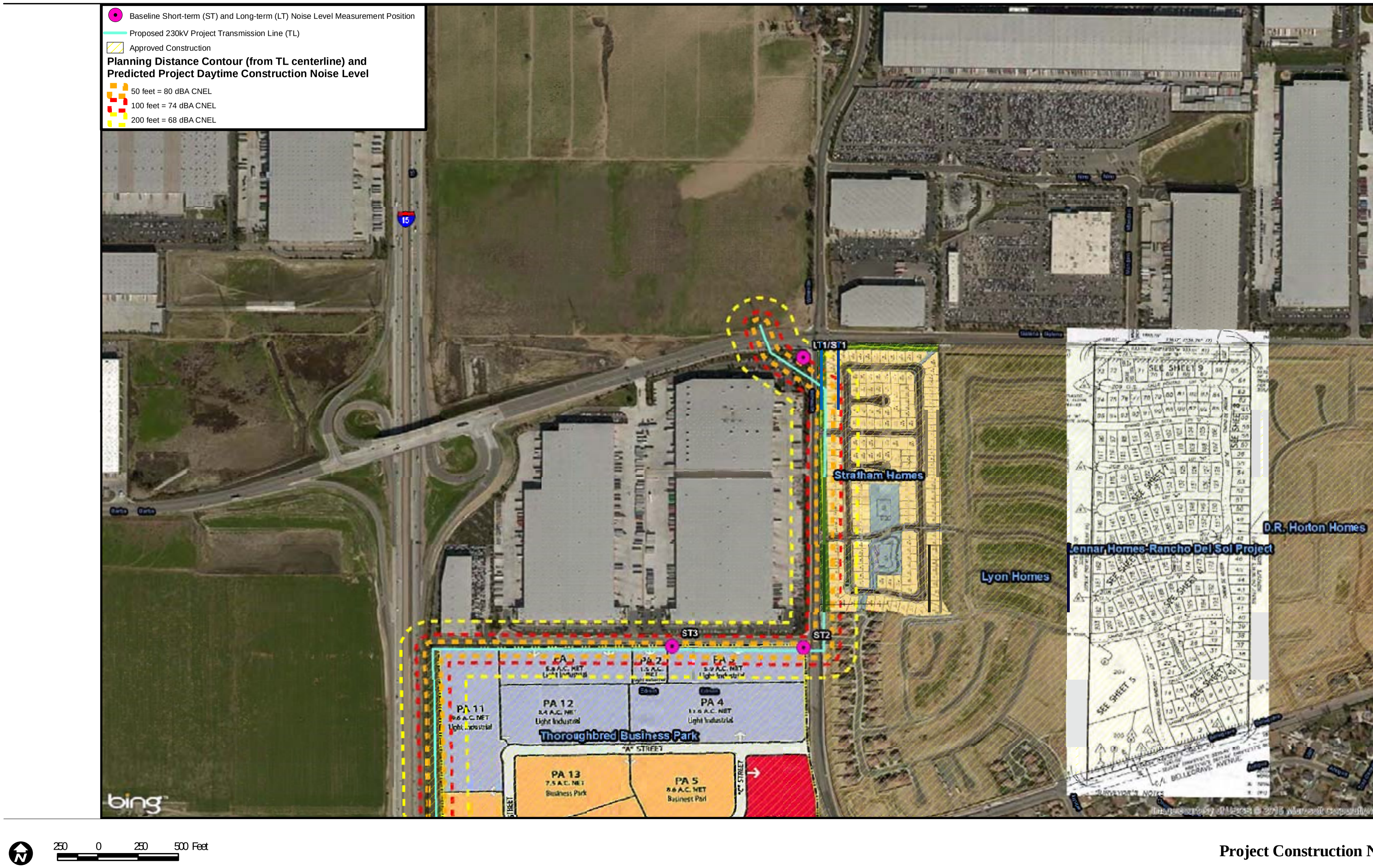


Figure 5A
Project Construction Noise Contours

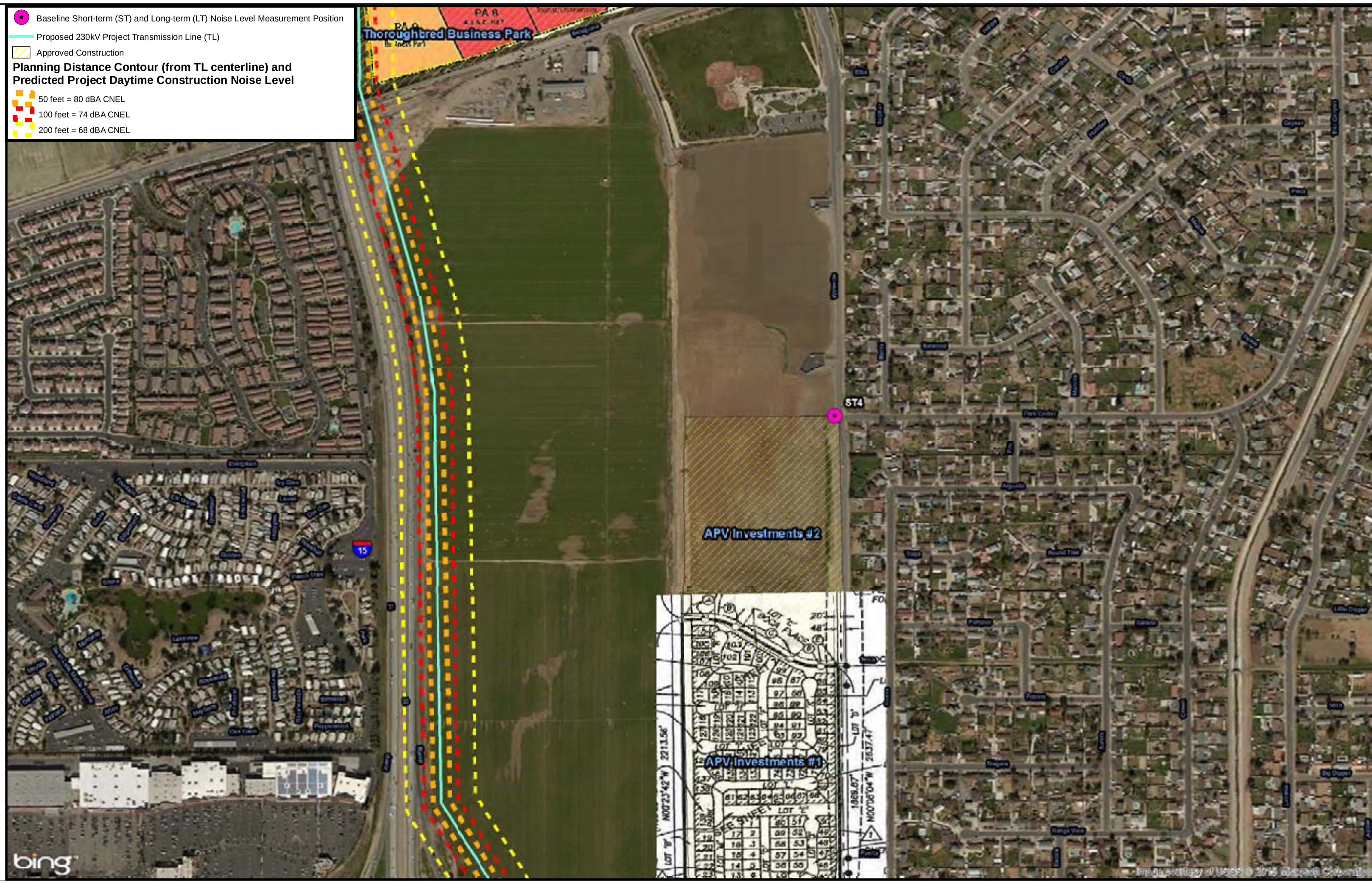


Figure 5B
Project Construction Noise Contours

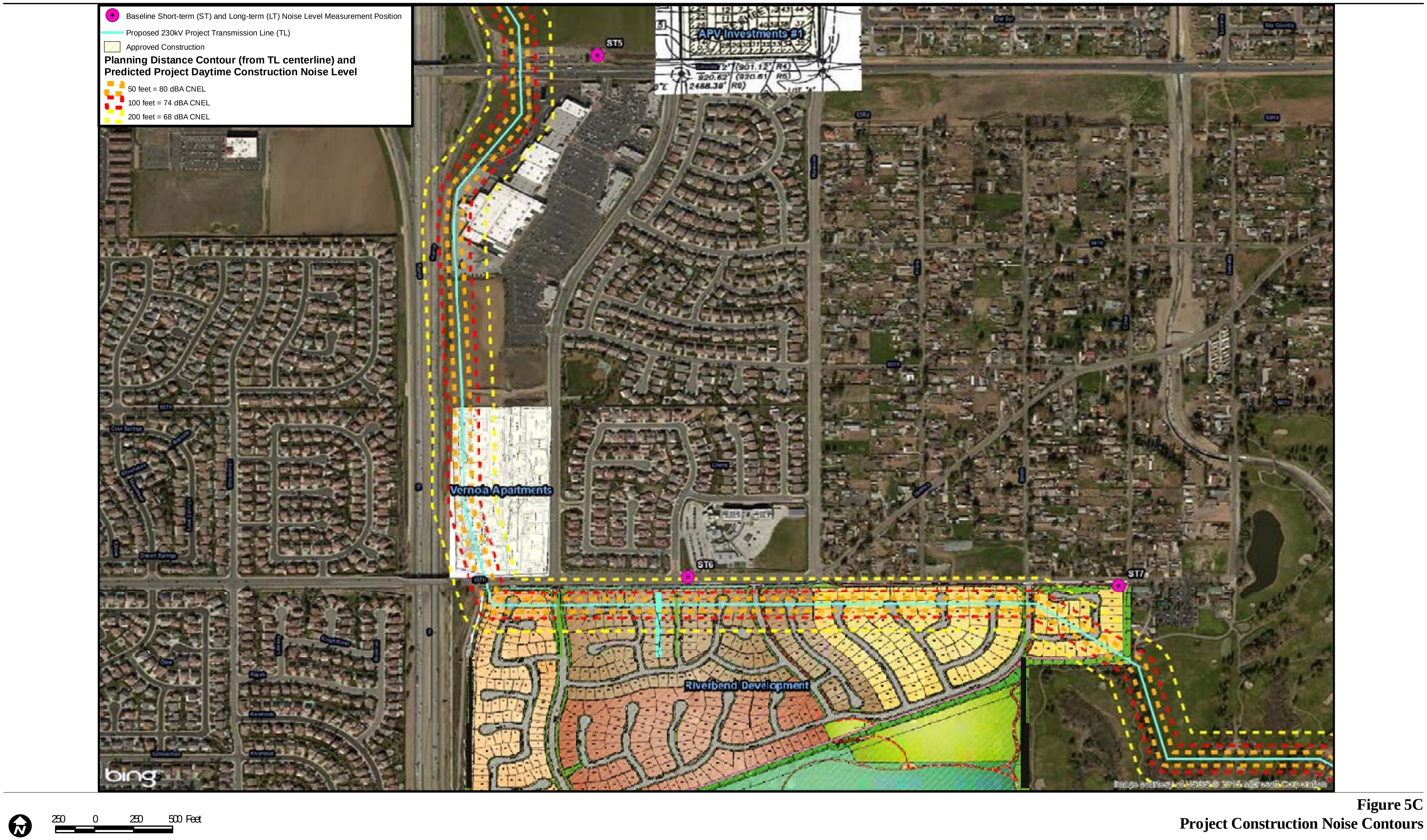


Figure 5C
Project Construction Noise Contours

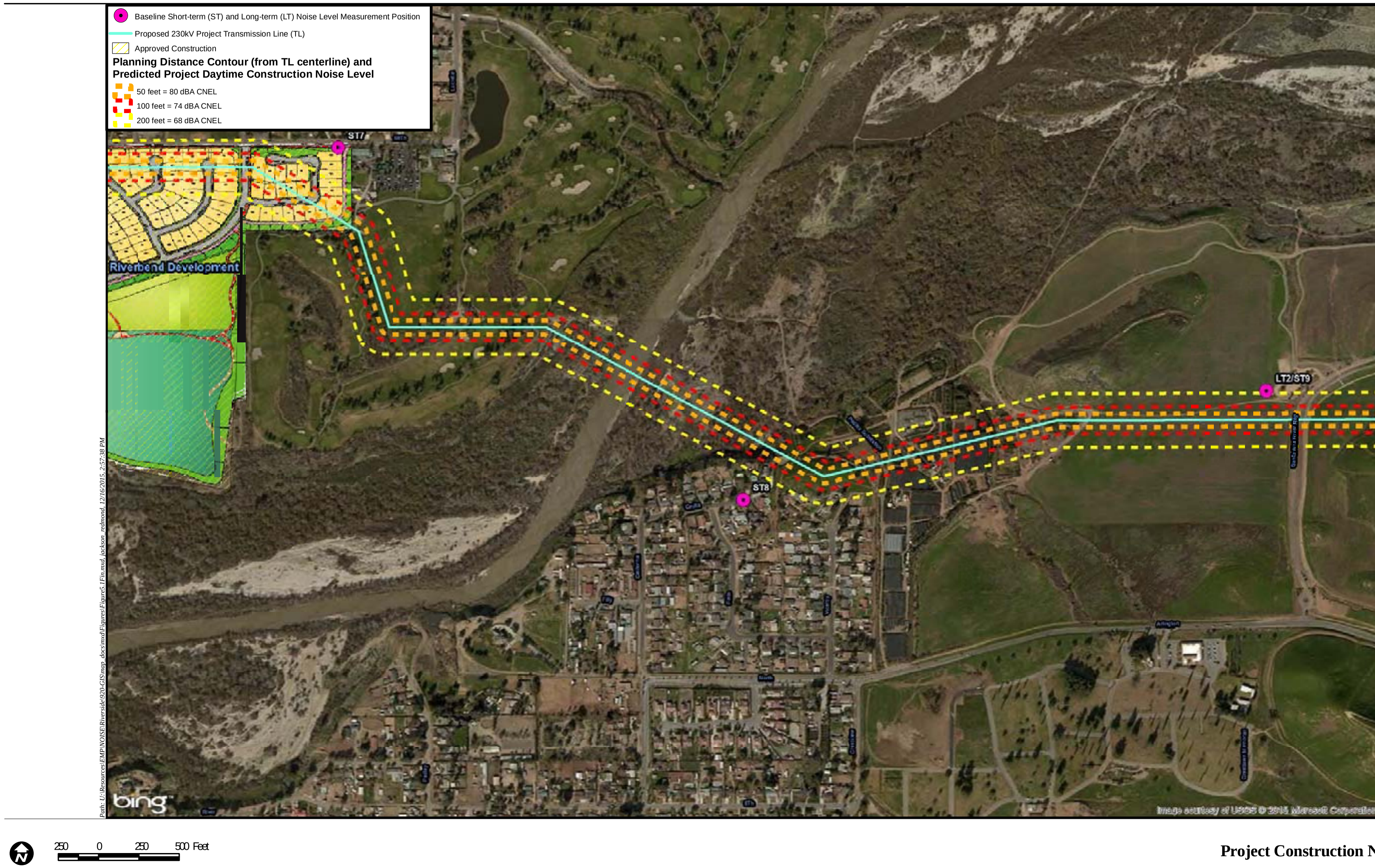


Figure 5D
Project Construction Noise Contours

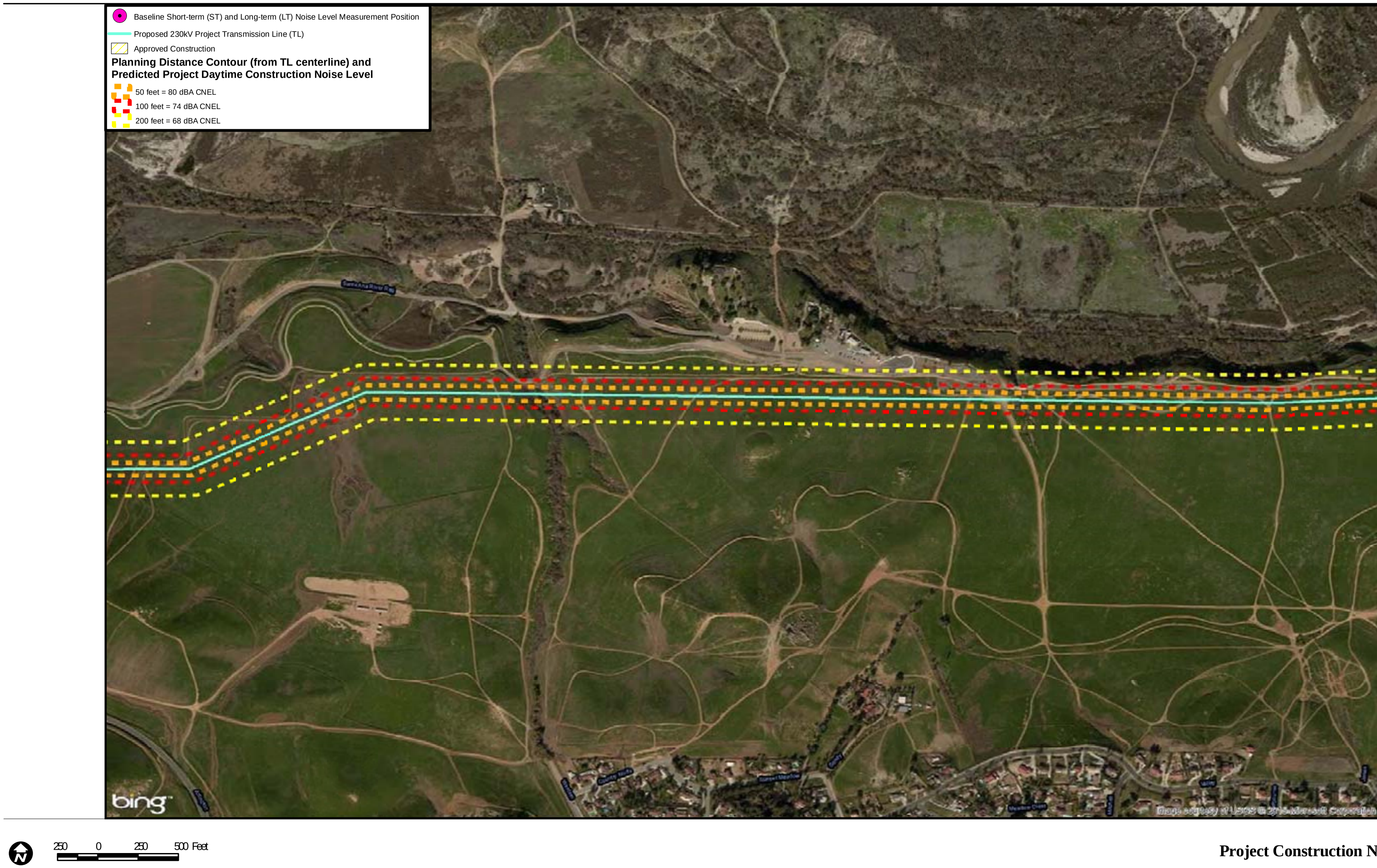


Figure 5E
Project Construction Noise Contours

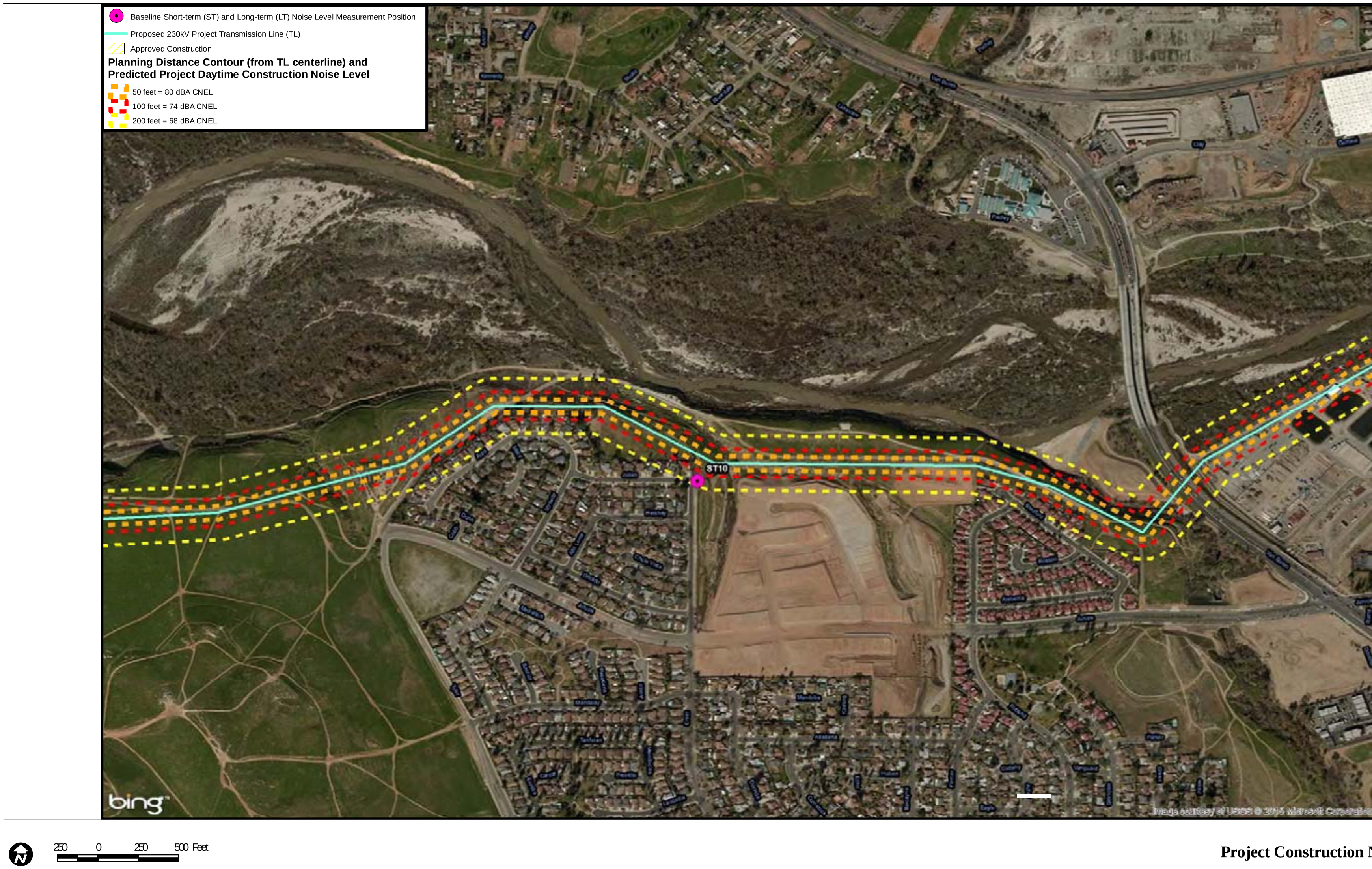


Figure 5F
Project Construction Noise Contours

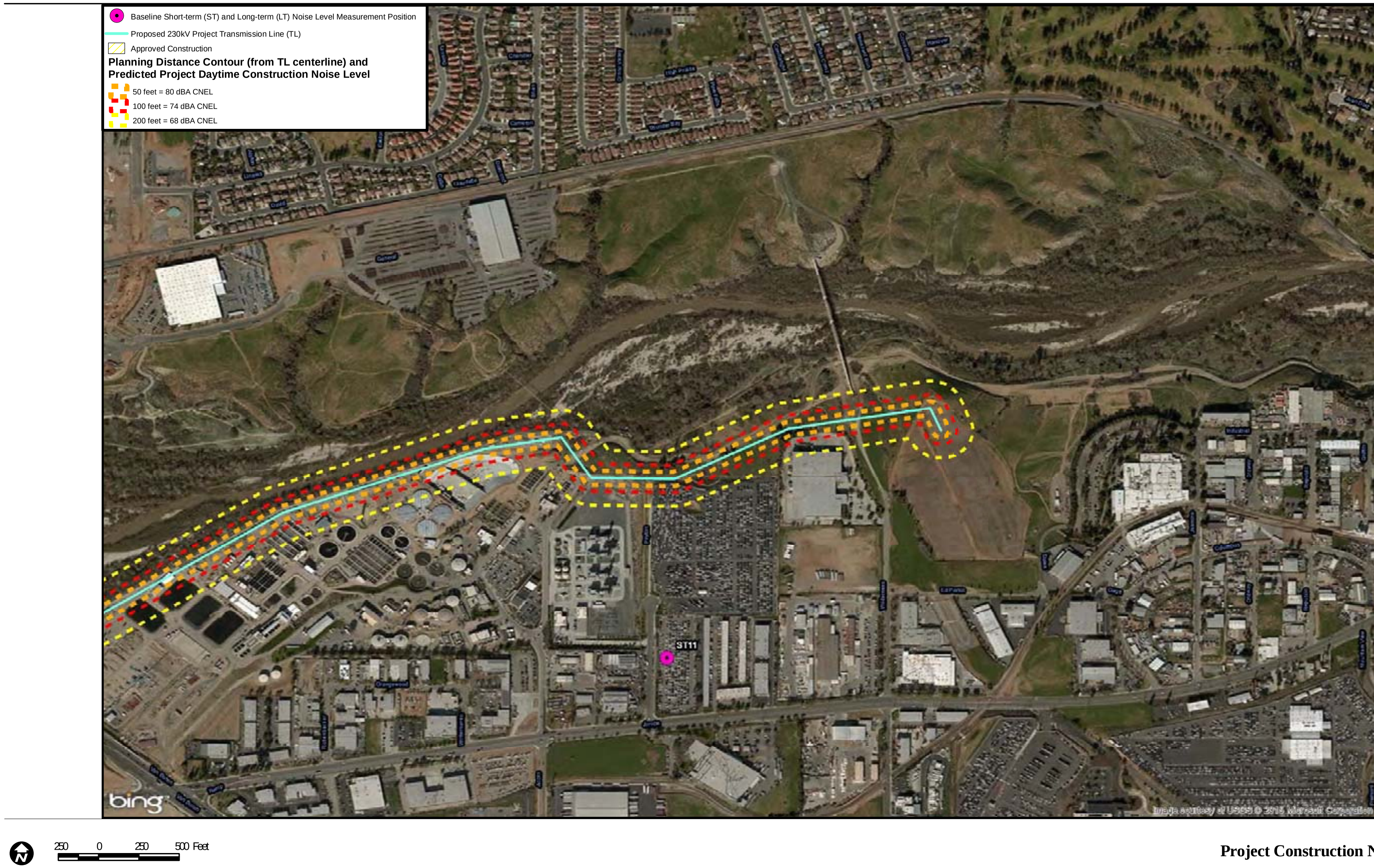


Figure 5G
Project Construction Noise Contours

As shown in Table 12, vibration levels at 25 feet from construction equipment, with the exception of pile drivers, are at or below the threshold of risk of structural damage (0.2 ppv in/sec). At distances beyond 65 feet, vibration levels would be below the threshold of risk of structural damage and below the threshold for human perception (0.1 ppv in/sec) beyond 80 feet.

Existing structures in proximity to the Project are located approximately 100 feet or greater from where major construction activities would occur. At this distance, vibration from Project construction activities would be below the vibration threshold of 0.2 in/sec ppv for structural damage (FTA 2006). Therefore, groundborne vibration generated by construction of the Project would not result in cosmetic or structural damage to nearby structures. Vibration from Project construction would not expose people or structures to excessive vibration levels that would result in structural damage or human annoyance. This is a less than significant impact.

Transport of materials by heavy trucks to and from construction sites has the potential to generate higher levels of groundborne vibration than mechanical equipment. However, heavy trucks generally operate at very low speeds on-site. Therefore, the groundborne vibration induced by heavy truck traffic is not anticipated to be perceptible at distances greater than 25 feet, and would be a **less than significant impact**.

5.3 TRAFFIC NOISE

Project construction would generate construction traffic from daily construction worker trips, construction equipment and materials delivery truck trips, and demolition materials truck hauling. However, construction vehicles would access the Project site using I-15, where Project construction trips would be a minor contribution to the average daily traffic volumes of I-15, which include a high percentage of truck volumes. Therefore, the increase in traffic volume due to Project construction-related traffic would result in a less than 1 dBA L_{eq} increase in noise levels along adjacent roadways, which is not considered a perceptible change in noise level. This is a less than significant impact.

Aside from occasional maintenance activities, the Project would not generate significant additional volumes of operational traffic and, therefore, would not expose people to current or future transportation noise levels that exceed applicable standards. This is a less than significant impact.

5.4 OPERATIONAL NOISE

Methodology and Modeling

The predicted AN levels from Project conductor corona were calculated using the same mathematical expressions that form the basis of the Bonneville Power Administration (BPA) Corona and Field Effects Program—the industry standard for these types of calculations. Appendix A presents a view of an Excel spreadsheet that contains these model parameters and equations used to estimate corona AN at the representative noise-sensitive receivers shown in Tables 13, 14, 15, and 16 and as appearing in Figures 6A through G. For example, the calculated L_{50} foul weather (i.e., rainy conditions) AN at a position approximately 50 horizontal feet from the 230 kV conductors is approximately 53 dBA. Under fair or dry weather conditions, according to the original BPA Technical Report ERJ-77-167 *Description of Equations and Computer Program for Predicting Audible Noise, Radio Interference, Television Interference, and Ozone from A-C Transmission Lines* contained in a BPA response to a public request for information (BPA 2015), the estimated AN level would be reduced by 25 dBA to L_{50} 28 dBA. For purposes of impact assessment, the L_{50} statistical value and L_{eq} metric will be considered comparable.

After accounting for environmental conditions and other factors such as differences in tower design and conductor arrangement, the predicted corona AN sound levels from this BPA-based technique appear to be generally consistent with field measurements of corona AN from an existing operating 230 kV transmission line as described in Section 3.4.

Impact Analysis

Tables 13 through 16 present an assessment of Project operational corona AN levels compared to applicable daytime and nighttime L_{eq} and CNEL standards, and whether it would result in substantial permanent increase in CNEL ambient levels, during fair and foul weather conditions, respectively, at the same locations studied for Project construction in Section 5.1.

Noise Standards

Tables 13 and 14 present the assessment of Project operational corona AN impact, during fair and foul weather conditions, with respect to allowable daytime and nighttime noise standard of 55 and 45 dBA $L_{eq,}$ respectively.

Table 13
Project Operation Corona Audible Noise (AN), Foul Weather, L_{eq} Standard

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Predicted Project 230 kV Transmission Line Corona Audible Noise (AN) (dBA, L_{eq})	Corona AN Exceeds Daytime Standard (55 dBA L_{eq})?	Corona AN Exceeds Nighttime Standard (45 dBA L_{eq})?
ST-1 (Stratham[1])	54	No	**Yes**
ST-2 (Stratham[2], Lyon[1])	54	No	**Yes**
ST-3 (Thoroughbred[3])	54	No	**Yes**
ST-4 (DR Horton[4])	36	No	No
ST-4 (Lennar[5], Lyon[8])	38	No	No
ST-4 (APV1[6], APV2[6])	39	No	No
ST-5 (APV2[7])	40	No	No
ST-5 (Vernola[1,2])	54	No	**Yes**
ST-6 (Riverbend[9])	54	No	**Yes**
ST-7 (Riverbend[9])	54	No	**Yes**
ST-8[10]	46	No	**Yes**
ST-9[11]	50	No	**Yes**
ST-10[12]	50	No	**Yes**
ST-11[13]	40	No	No

Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

Table 14
Project Operation Corona Audible Noise (AN), Fair Weather, L_{eq} Standard

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Predicted Project 230 kV Transmission Line Corona Audible Noise (AN) (dBA, L_{eq})	Corona AN Exceeds Daytime Standard (55 dBA L_{eq})?	Corona AN Exceeds Nighttime Standard (45 dBA L_{eq})?
ST-1 (Stratham[1])	29	No	No
ST-2 (Stratham[2], Lyon[1])	29	No	No
ST-3 (Thoroughbred[3])	29	No	No
ST-4 (DR Horton[4])	11	No	No
ST-4 (Lennar[5], Lyon[8])	13	No	No
ST-4 (APV1[6], APV2[6])	14	No	No
ST-5 (APV2[7])	15	No	No
ST-5 (Vernola[1,2])	29	No	No
ST-6 (Riverbend[9])	29	No	No
ST-7 (Riverbend[9])	29	No	No
ST-8[10]	21	No	No
ST-9[11]	25	No	No
ST-10[12]	25	No	No
ST-11[13]	15	No	No

Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

As shown in Tables 13 and 14, the proposed Project operation AN would generally not expose persons to noise levels in excess of standards established in applicable general plans or noise ordinances for a majority of time the facilities are in operation. Corona effects from the 230 kV transmission lines would result in short-term, temporary instantaneous noise levels in excess of local standards (45 dBA L_{eq} at night, and 55 dBA L_{eq} during the day) only at the indicated locations in Table 11 during “foul” weather (i.e., rain or related conditions that wet the conductor surface) conditions. Under “fair” weather conditions that generally typify the Project vicinity, noise impacts are not expected as shown in Table 14. Therefore, impacts would be **less than significant.**

Ambient Noise Levels

Tables 15 and 16 present the assessment of Project operational corona AN impact, during “fair” and “foul” weather conditions, with respect to allowable permanent outdoor ambient noise increment of and a residential land use compatibility noise standard of 60 dBA CNEL.

Table 15
Project Operation Corona Audible Noise (AN),
Foul Weather, CNEL Standard/Increase

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Measured Existing Outdoor Ambient Sound Level (dBA, CNEL)	Predicted Project 230 kV Transmission Line Corona Audible Noise** (AN) (dBA, CNEL)	Future Ambient (Log-sum of Existing Ambient and Predicted Corona AN) (dBA, CNEL)	Increase over Existing Ambient due to Corona AN Contribution (dBA, CNEL)	Impact? (>60 dBA CNEL from Corona AN or >5 dBA, CNEL ambient increment)
ST-1 (Stratham[1])	68	59	69	1	No
ST-2 (Stratham[2], Lyon[1])	77	59	77	0	No
ST-3 (Thoroughbred[3])	65	59	66	1	No
ST-4 (DR Horton[4])	68	41	68	0	No
ST-4 (Lennar[5], Lyon[8])	68	44	68	0	No
ST-4 (APV1[6], APV2[6])	68	45	68	0	No
ST-5 (APV2[7])	64	46	64	0	No
ST-5 (Vernola[1,2])	64	59	64	0	No
ST-6 (Riverbend[9])	67	59	68	1	No
ST-7 (Riverbend[9])	48	59	59	**11**	**Yes**
ST-8[10]	54	52	56	2	No
ST-9[11]	61	55	62	1	No
ST-10[12]	57	56	60	3	No
ST-11[13]	58	46	58	0	No

Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
** assumes foul weather conditions only at night (10 p.m. to 7 a.m.)
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

Table 15 exhibits that at all representative receptor locations, predicted corona AN under "foul" weather conditions is not expected to exceed 60 dBA CNEL, and only one location (representing the northeastern corner of the Riverbend development) might experience an increase in ambient sound greater than 5 dBA.

Table 16
Project Operation Corona Audible Noise (AN), Fair Weather, CNEL Standard/Increase

Ambient Survey Position (ASP) ID (and Representative Receptor Location*)	Measured Existing Outdoor Ambient Sound Level (dBA, CNEL)	Predicted Project 230 kV Transmission Line Corona Audible Noise** (AN) (dBA, CNEL)	Future Ambient (Log-sum of Existing Ambient and Predicted Corona AN) (dBA, CNEL)	Increase over Existing Ambient due to Corona AN Contribution (dBA, CNEL)	Impact? (>60 dBA CNEL from Corona AN or >5 dBA, CNEL ambient increment)
ST-1 (Stratham[1])	68	35	68	0	No
ST-2 (Stratham[2], Lyon[1])	77	35	77	0	No
ST-3 (Thoroughbred[3])	65	36	65	0	No
ST-4 (DR Horton[4])	68	17	68	0	No
ST-4 (Lennar[5], Lyon[8])	68	20	64	0	No
ST-4 (APV1[6], APV2[6])	68	21	67	0	No
ST-5 (APV2[7])	64	22	64	0	No
ST-5 (Vernola[1,2])	64	35	64	0	No
ST-6 (Riverbend[9])	67	35	67	0	No
ST-7 (Riverbend[9])	48	35	48	0	No
ST-8[10]	54	28	54	0	No
ST-9[11]	61	31	61	0	No
ST-10[12]	57	32	57	0	No
ST-11[13]	58	22	58	0	No

Exceedances shown in **bold**
* Represented Entitled or Under-construction Development
** assumes fair weather conditions all day, evening, and night
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

As shown in Table 16, the proposed Project would be in compliance with the allowable outdoor permanent ambient noise CNEL standard and increment; therefore, impacts would be **less than significant.**

Corona Noise Level Contours

Figures 6A through G display predicted Project corona AN as iso-pleths (a.k.a., noise contours), radiating out from the Project alignment, superimposed on aerial imagery of the Project vicinity. While these contours only represent Project corona AN and not the future ambient levels as presented in Tables 15 and 16, the reader can see in Figures 6A through 6G, where corona AN during fair weather conditions at certain dBA CNEL is expected. During foul weather conditions, these predicted contours would be at the same distances, but would be characterized by AN values that are 25 dBA higher than those shown.

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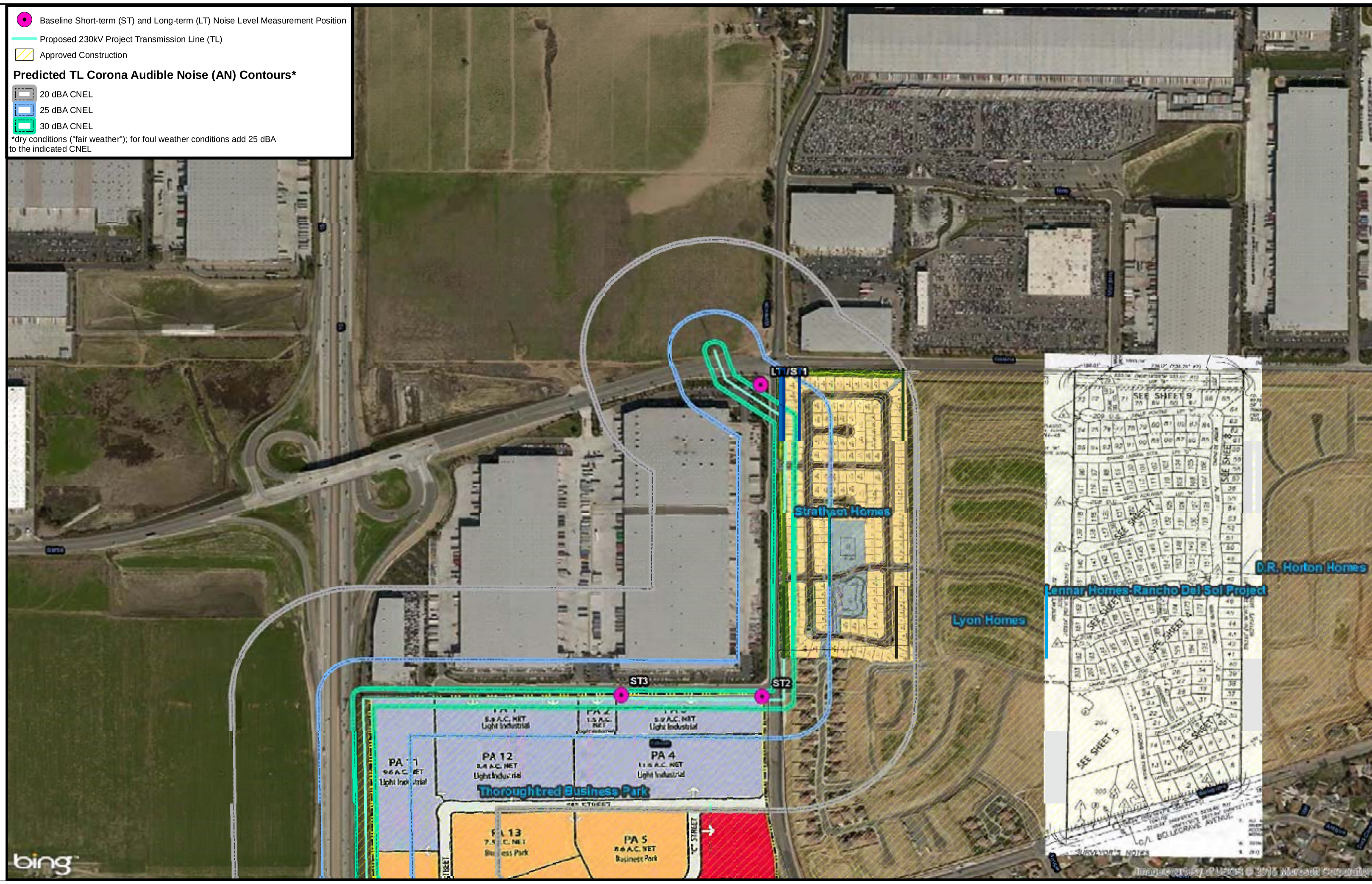

Figure 6A
Project Corona Noise Contours

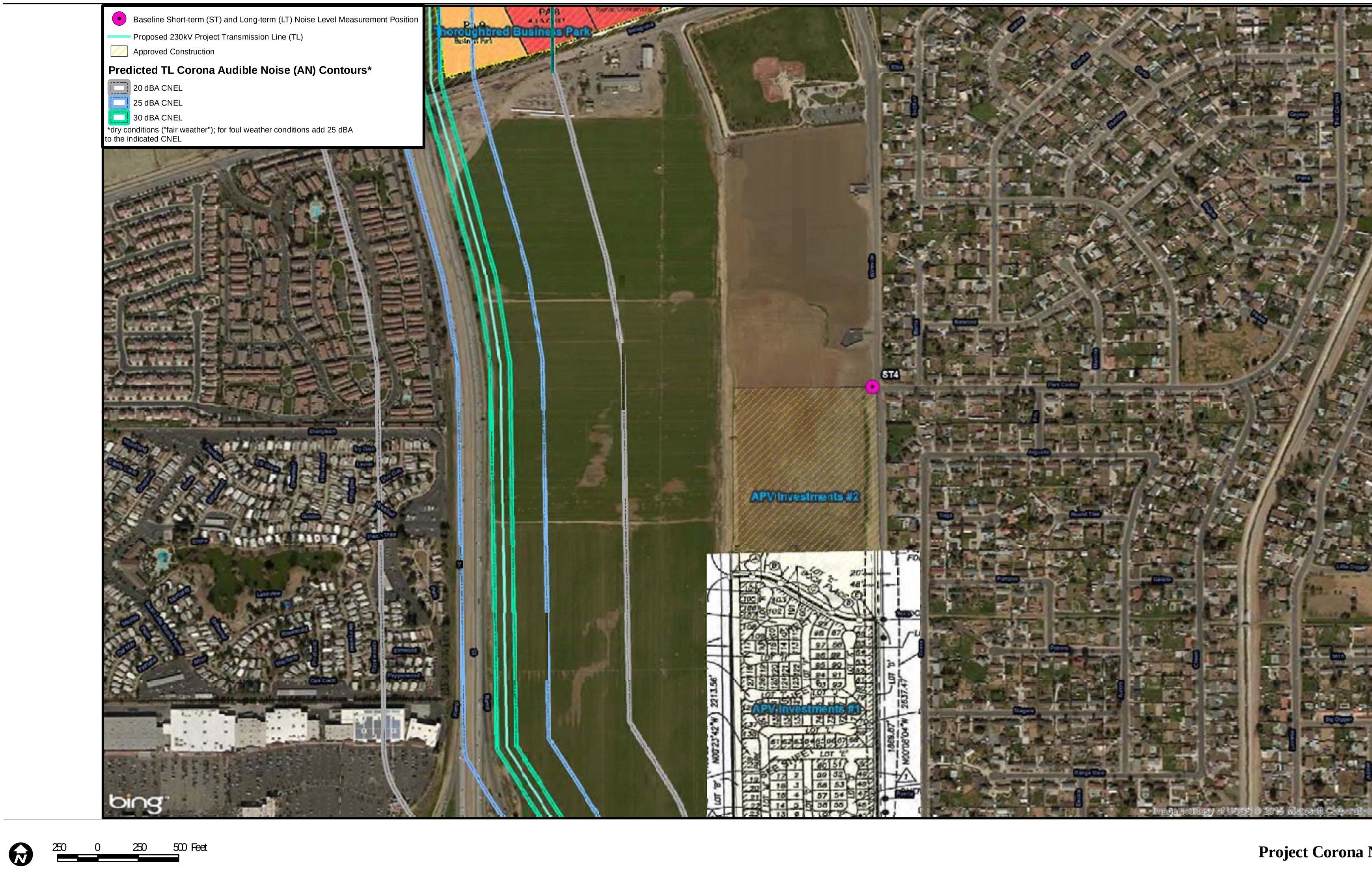

Figure 6B
Project Corona Noise Contours

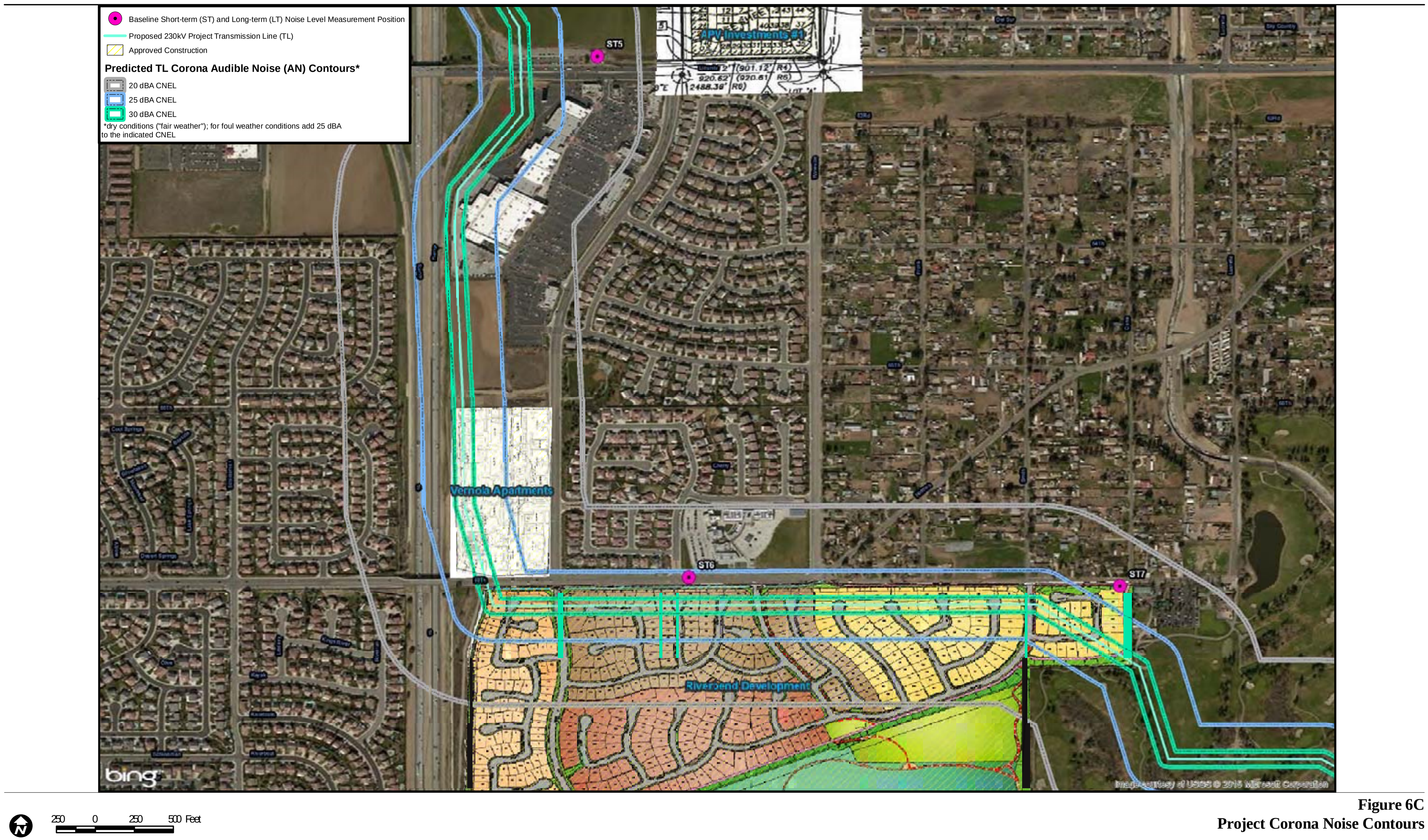

Figure 6C
Project Corona Noise Contours

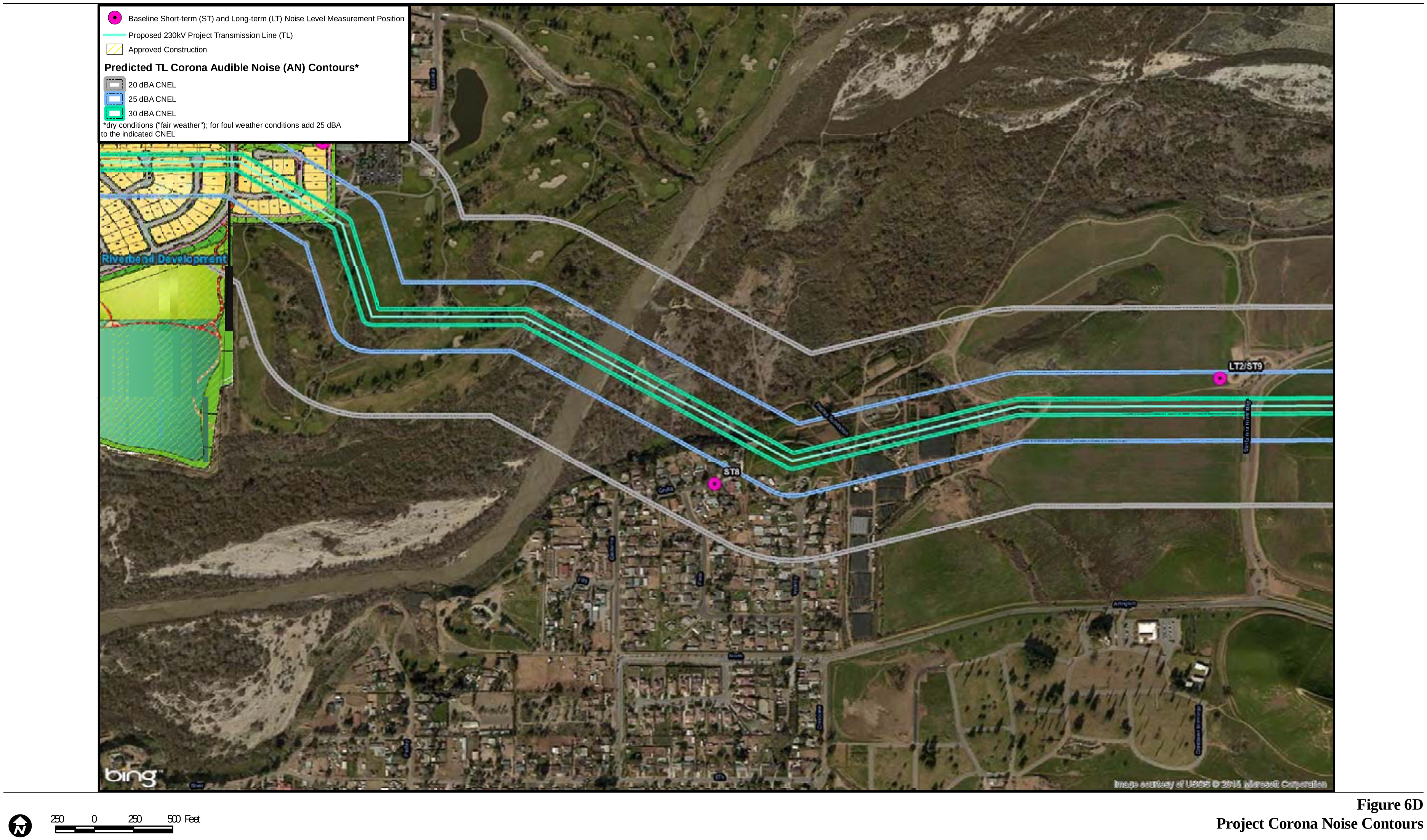

Figure 6D
Project Corona Noise Contours

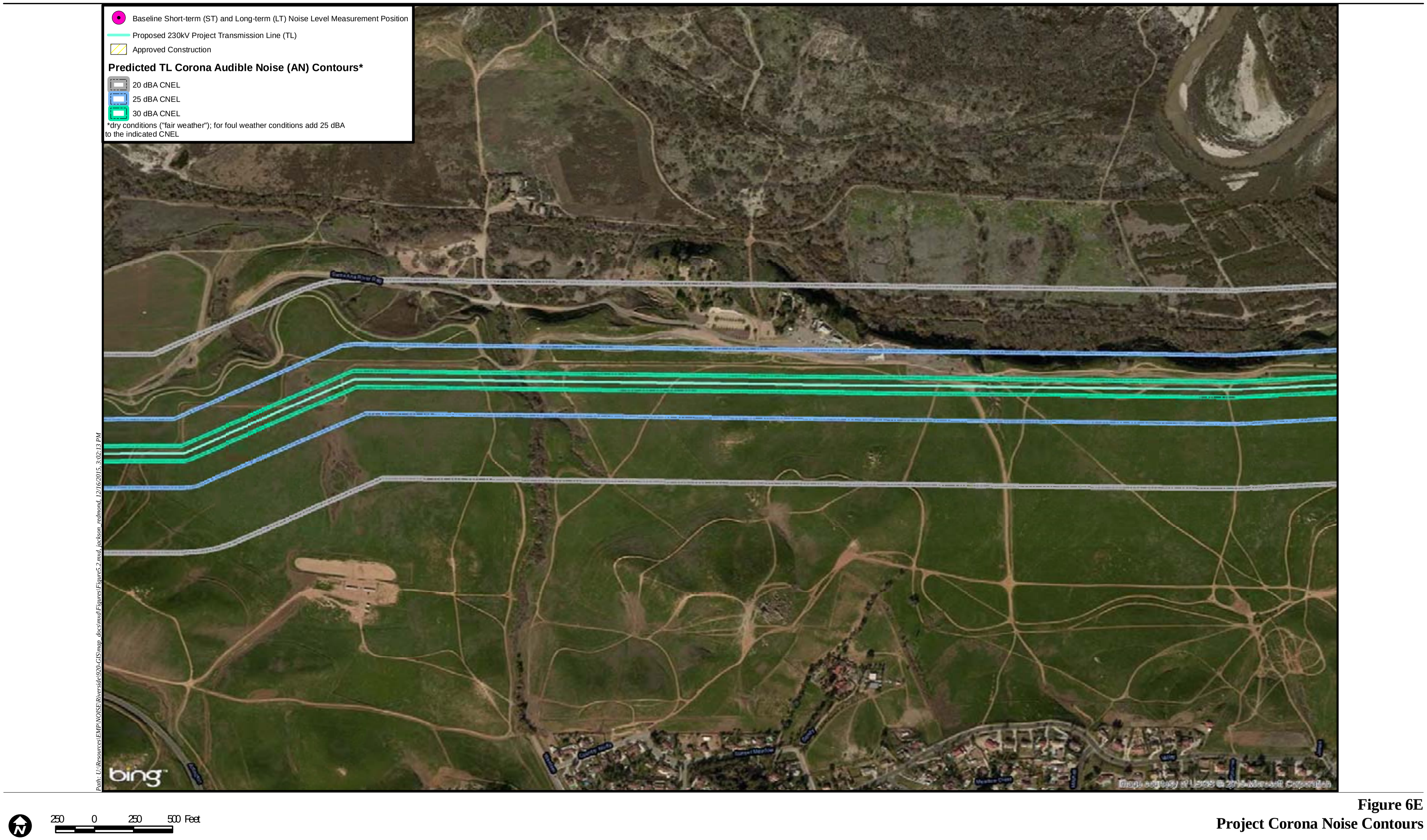

Figure 6E
Project Corona Noise Contours

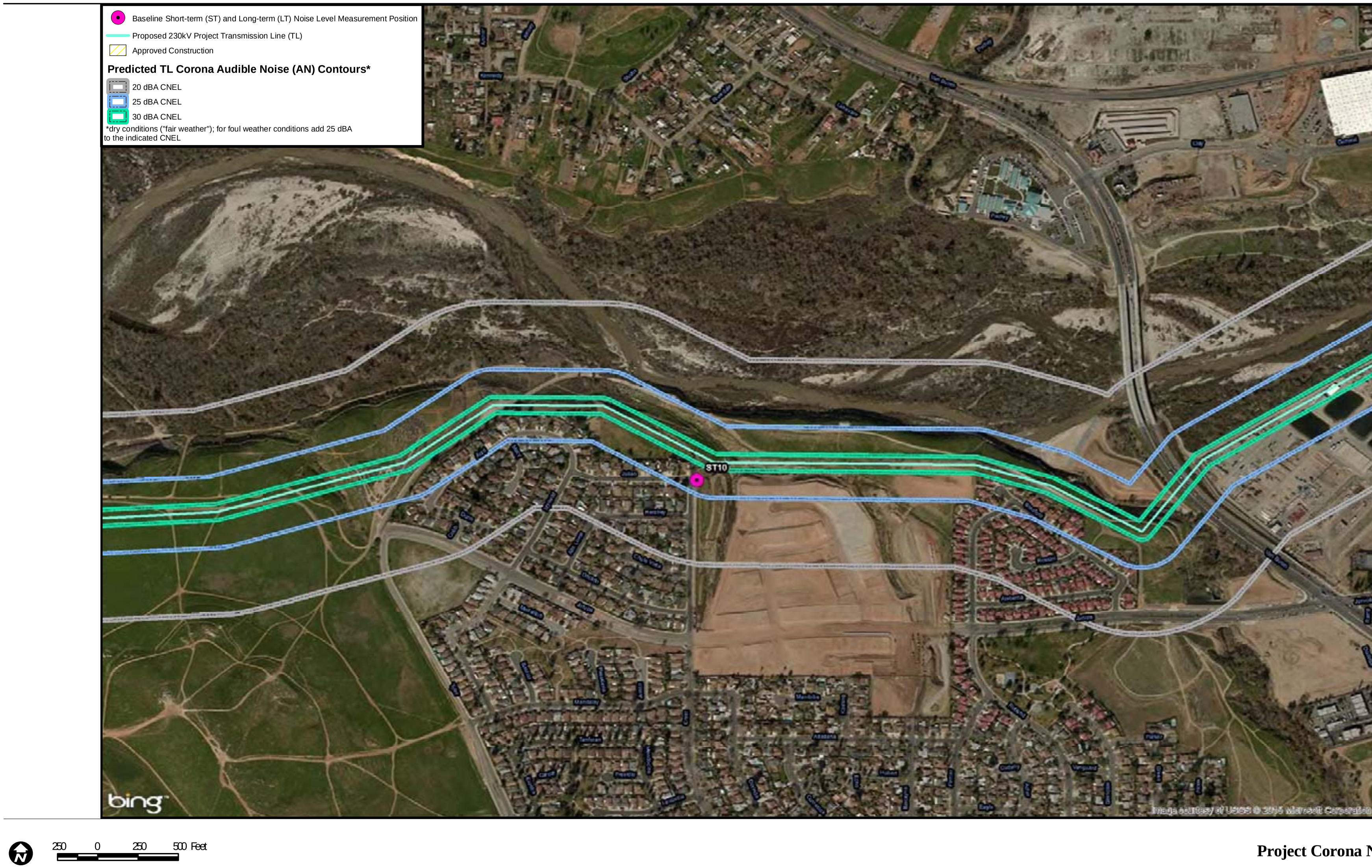

Figure 6F
Project Corona Noise Contours

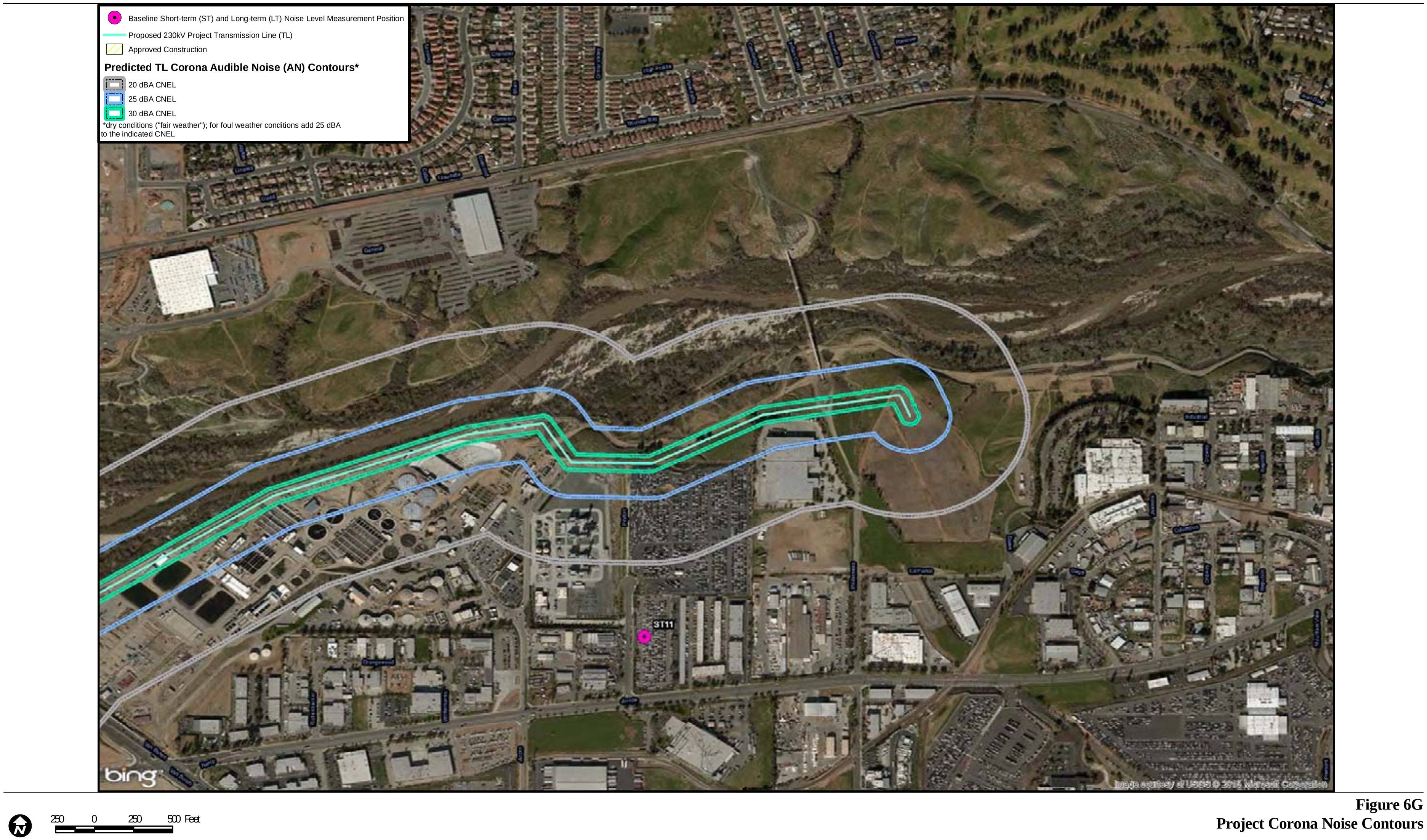

Figure 6G
Project Corona Noise Contours

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6.0 APPLICANT PROPOSED MEASURES

6.1 APPLICANT PROPOSED MEASURES

The following applicant proposed measures (APMs) are provided to reduce Project construction and operational noise levels, and where potentially significant noise impacts have been identified, to attempt to reduce levels below those that indicate significant impacts.

Project Construction

As discussed in Section 5.1, Project construction noise may occur during hours outside of those specified by local noise ordinances and daytime construction noise levels would result in a substantial increase in ambient noise levels at representative receptor locations for the Stratham, Lyon and Thoroughbred developments, as well as representative receptor locations ST-7, ST-9 and ST-10, which would result in **potentially significant impacts**.

Were Project construction activity noise to occur at night, involving likely equipment as described in Section 5 and during hours when construction noise is not exempt from local noise ordinance thresholds, potentially significant impacts are predicted for the Stratham, Lyon and Thoroughbred developments, as well as representative receptor locations ST-5 (Vernola), ST-7, ST-8 and ST-9. With respect to an increase in ambient noise levels, potentially significant impacts are predicted for the Stratham and Thoroughbred developments, along with ST-5 (Vernola), ST-6, ST-7 and ST-9.

The following typical construction noise reduction measures are recommended to reduce and minimize noise levels during construction, including, but not limited to:

- NOI-1 (Implement Noise Complaint Reporting) – The Project (via construction contractor) would establish a telephone hot-line for use by the public to report any perceived significant adverse noise conditions associated with the construction of the Project. If the telephone is not staffed 24 hours per day, the contractor would include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This hot-line telephone number would be posted at the Project site during construction in a manner visible to passersby. This telephone number would be maintained until the Project has been considered commissioned and ready for operation.

- NOI-2 (Implement Noise Complaint Investigation) – Throughout the construction of the Project, the contractor would document, investigate, evaluate, and attempt to resolve all Project-related noise complaints. The contractor or its authorized agent would:
  - Use a Noise Complaint Resolution Form to document and respond to each noise complaint;
  - Contact the person(s) making the noise complaint within 24 hours;
  - Conduct an investigation to attempt to determine the source of noise related to the complaint; and
  - Take all reasonable measures to reduce the noise at its source.
- NOI-3 (Implement Construction Practices) – The following are typical field techniques for reducing noise from construction activities, with the purpose of reducing aggregate construction noise levels at nearby noise-sensitive receptors:
  - To the extent practical and unless safety provisions require otherwise, adjust all audible back-up alarms downward in sound level, reflecting vicinities that have expected lower background level, while still maintaining adequate signal-to-noise ratio for alarm effectiveness. Consider signal persons, strobe lights, or alternative safety equipment and/or processes as allowed, for reducing reliance on high-amplitude sonic alarms.
  - Place stationary noise sources, such as generators and air compressors, on the Project site away from affected noise-sensitive receivers. Place non-noise-producing mobile equipment such as trailers in the direct sound pathways between suspected major noise-producing sources and sensitive receptors.
- NOI-4 (Implement Equipment Noise Reduction) – The following are typical practices for construction equipment selection (or preferences) and expected function that can help reduce noise.
  - Pneumatic impact tools and equipment used at the construction site would have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.
  - Provide impact noise producing equipment (i.e., jackhammers and pavement breaker[s]) with noise attenuating shields, shrouds or portable barriers or enclosures, to reduce operating noise.

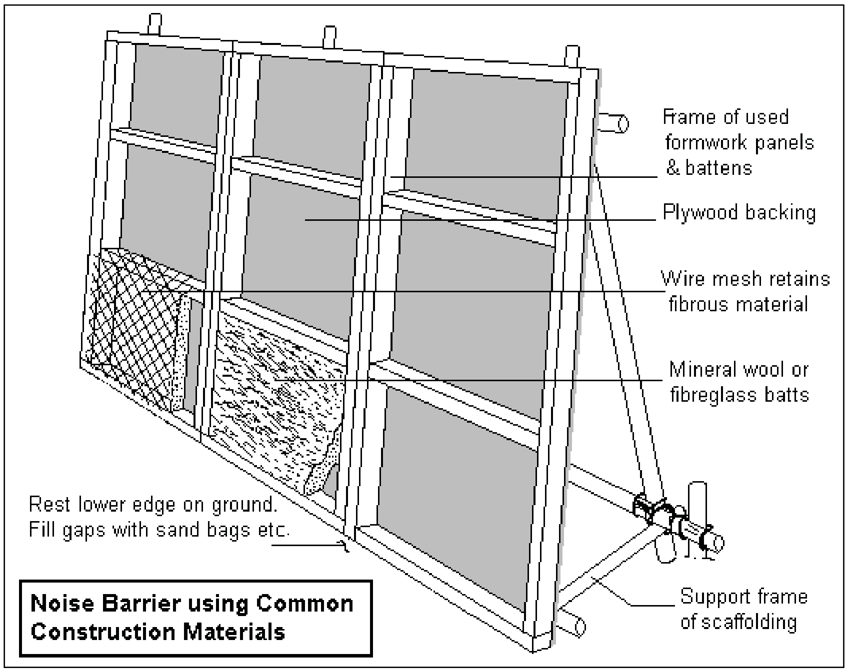
- Line or cover hoppers, storage bins, and chutes with sound-deadening material (e.g., apply wood or rubber liners to metal bin impact surfaces).
- Provide upgraded mufflers, acoustical lining, or acoustical paneling for other noisy equipment, including internal combustion engines.
- Use alternative procedures of construction and select a combination of techniques that generate the least overall noise and vibration.
- Use construction equipment manufactured or modified to reduce noise and vibration emissions, such as:
  - Electric instead of diesel-powered equipment.
  - Hydraulic tools instead of pneumatic tools.
  - Electric saws instead of air- or gasoline-driven saws.

- NOI-5 (After-Hours Construction) – In the event construction activities are necessary on days or hours outside of what is specified by noise ordinance, SCE would provide 5-day advanced notification, including a general description of the work to be performed, location, and hours of construction anticipated, to the CPUC, local municipality or County where anticipated work is to be performed, and residents within 300 feet of the anticipated work, as well as route all construction traffic and/or helicopter flight(s) away from residences, schools and recreational facilities to the maximum extent feasible.

If there is insufficient space or lack of available resources (e.g., semi-truck trailers, bulk material containers, moving vans, etc.) to create a noise barrier using non-noise-producing equipment in use at an active construction site as suggested in one of the NOI-3 options, the contractor may also employ field-erected temporary noise barriers. Options for such on-site barriers could include, but are not necessarily limited to, using appropriately thick wooden panel walls (at least ½-inch thick) that resemble what appears in Figure 7 and are high enough to block the line-of-sight from the dominant construction noise source(s) to the noise-sensitive receptor. Such barriers could, depending on factors such as barrier height, barrier length, and distance between the barrier and the noise-producing equipment or activity, reduce construction noise by 5 to 15 dBA at nearby noise-sensitive receptor locations. Alternately, field-erected noise curtain assemblies could be installed around specific equipment sites or zones of anticipated mobile or stationary activity, resembling the sample shown in Figure 8. These techniques are most effective and practical when the construction activity noise source is stationary (e.g., auger or drill operation) and the specific source locations of noise emission are near the ground and can be placed as close to the equipment/activity-facing side of the noise barrier as possible. Although barrier layout and other implementation details would vary by construction site, the following are coarse categories of expected temporary barrier performance:

- *Short barrier* (SB) – provides linear occlusion (expected noise reduction between 3 to 5 dBA), and has a total length less than four times the perpendicular distance between the barrier and the geographic center of the set of noise-producing construction equipment.
- *Medium barrier* (MB) – provides linear occlusion (expected noise reduction between 5 to 10 dBA), and has a total length between four to eight times the perpendicular distance between the barrier and the geographic center of the set of noise-producing construction equipment. Alternately, the barrier may be shorter in extent (not height) so long as the included angle (α) between the noise source(s) and the ends of the barrier must be at least 160 degrees—please refer to Figure 9, which shows the end-flanking effect of the included angle on what is otherwise a barrier designed (based on height, etc.) to deliver an indicated "S" value of insertion loss.
- *Long barrier* (LB) – provides linear occlusion (expected noise reduction between 10 to 15 dBA), and has a total length of at least eight times the perpendicular distance between the barrier and the geographic center of the set of noise-producing construction equipment. Alternately, the barrier may be shorter in extent (not height) so long as the included angle (α) between the noise source(s) and the ends of the barrier is greater than 180 degrees.

Figure 7
Temporary Noise Barrier using Common Construction Site Materials

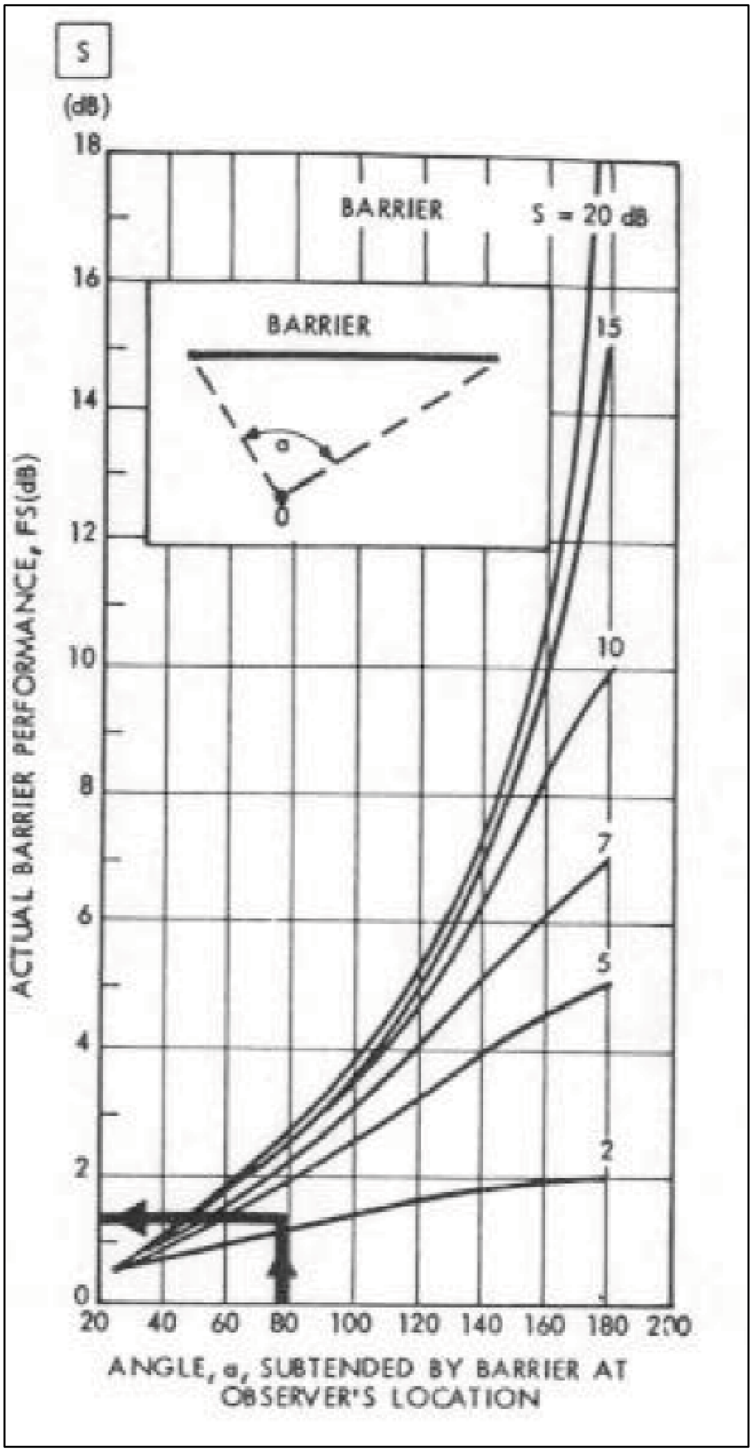


Source: Eaton, Construction Noise, 2000

Figure 8
Sample Site-Erected Curtain-type Noise Barrier

Source: AECOM (2015)

Figure 9
Effect of Included Angle on Noise Barrier Performance



Source: HUD (1991)

In all three barrier types above, the barrier material is assumed to be solid and dense enough to demonstrate acoustical transmission loss (TL) that is at least 10 dBA greater than the estimated noise reduction effect. These suggested barrier types do not represent the only ways to achieve the indicated noise reduction in dBA; rather, they represent examples of how such noise attenuation might be attained by an implemented APM under the right conditions and offer some insight on the level of resources (e.g., barrier extent) likely to be involved. Hence, Table 17 presents the representative receptor locations that would, on the basis of predicted construction noise impact assessment appearing in Tables 9, 10 and 11, likely need the indicated APM-provided noise reduction in order to result in predicted Project construction noise no greater than 45 dBA (Table 9 assessment results for potential nighttime construction) or 10 dBA above the existing ambient sound level (Tables 10 and 11 for daytime and nighttime).

Table 17
Probable Construction Noise Reduction Need at Representative Receivers

Ambient Survey Position (ASP) ID (and Representative Receptor [RR] Location*)	Nighttime Construction Noise Reduction, to comply with 45 dBA at RR (dBA)	Daytime Construction Noise Reduction, to comply with <= 10 dBA increase over ambient at RR (dBA)	Nighttime Construction Noise Reduction, to comply with <= 10 dBA increase over ambient at RR (dBA)
ST-1 (Stratham[1])	29	10	4
ST-2 (Stratham[2], Lyon[1])	29	7	n/a
ST-3 (Thoroughbred[3])	29	11	7
ST-4 (DR Horton[4])	n/a	n/a	n/a
ST-4 (Lennar[5], Lyon[8])	n/a	n/a	n/a
ST-4 (APV1[6], APV2[6])	n/a	n/a	n/a
ST-5 (APV2[7])	n/a	n/a	n/a
ST-5 (Vernola[1,2])	29	n/a	8
ST-6 (Riverbend[9])	29	n/a	14
ST-7 (Riverbend[9])	29	2	28
ST-8[10]	5	n/a	n/a
ST-9[11]	12	8	5
ST-10[12]	n/a	6	n/a
ST-11[13]	n/a	n/a	n/a

n/a = not applicable, noise mitigation not anticipated for this case/scenario
* Represented Entitled or Under-construction Development
[1] northern end of westernmost row of homes, 50 feet from the Project alignment
[2] southern end of westernmost row of homes, 50 feet from the Project alignment
[3] northern portion of light industrial development, 50 feet from the Project alignment
[4] westernmost row of homes, as close as approximately 3,500 feet from the Project alignment
[5] westernmost row of homes, as close as approximately 2,000 feet from the Project alignment
[6] westernmost row of homes, as close as approximately 1,750 feet from the Project alignment
[7] westernmost row of homes, as close as approximately 1,500 feet from the Project alignment
[8] easternmost row of homes, as close as approximately 2,000 feet from the Project alignment
[9] approximately 50 feet from the Project alignment, assuming 100-foot-wide Project right-of-way
[10] approximately 425 feet from the Project alignment
[11] approximately 212 feet from the Project alignment
[12] approximately 168 feet from the Project alignment
[13] approximately 1,330 feet from the Project alignment

SCE and its contractor(s) would consider these predicted construction noise reduction values (at the indicated representative receptor locations) the acoustical objectives they need to consider and for which to evaluate, develop, and properly implement an appropriate APM that either enables sufficient noise control at the noise-producing sources, sound attenuation along the sound pathways between source and receiver, noise abatement at or near the receptors of concern, or some combination of these three techniques.

Project Operation

Based on the predictive analysis, Project operation could generate transmission line corona AN that would exceed local night residential standards of 45 dBA L_{eq} at several representative receptor locations during temporary or intermittent periods associated with "foul" weather conditions (i.e., rain or related conditions that wet the conductor surface) as shown in Table 11. And at the northeastern corner of the Riverbend development, based on measured ambient sound levels at ST-7 and as shown in Table 13, the temporary increase in ambient sound under such conditions might be greater than 5 dBA. However, the following reasons support an assertion that corona AN, overall, does not create a significant impact requiring APM:

1. Even under "foul" weather conditions, predicted corona AN is less than 60 dBA CNEL and thus compatible with outdoor noise levels for residential developments.
2. While the opportunity for "foul" weather conditions could occur over the lifetime of the Project, such conditions would not be considered "permanent" or durable and are instead considered intermittent and temporary—they occur and last only as long as the right meteorological conditions or conductor surface conditions are present.
3. Under "fair" weather conditions that generally typify the environmental status of the Project vicinity, Tables 12 and 14 illustrate that predicted Project corona AN would not exceed the local day and night L_{eq} and CNEL standards, nor create a significant permanent ambient CNEL increase.

6.2 SIGNIFICANCE AFTER APMs

Implementation of APMs NOI-1 though NOI-4 would reduce daytime Project construction noise levels at the source. To reduce daytime Project construction noise levels below levels of significance, implementation of NOI-3 (Implement Construction Practices) and NOI-4 (Implement Equipment Noise Reduction), specifically, the construction of temporary noise barriers adjacent to the source, would be required. After the implementation of APMs NOI-1 though NOI-4, daytime Project construction noise levels would be reduced at the source, resulting in less than substantial increases in ambient noise levels during the daytime at residential locations; this would be a **less than significant impact**.

In the event construction activities are necessary on days or hours outside of what is specified by noise ordinance, SCE would implement NOI-5 (after-hours construction) in order to reduce construction noise impacts to the extent feasible. However, despite the implementation of NOI-5, after-hours construction noise impacts would potentially be significant and unavoidable.

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7.0 CONCLUSIONS

Project construction would be expected to occur, depending on specific location and the applicable local municipal or County noise regulations or general plan policies, within the allowable hours of construction activity (and during which time construction noise limits may not be established or specified) or during periods of time that exempt construction activity noise from otherwise applicable noise level thresholds; hence, with respect to relevant noise standards, this would be a less than significant impact. However, in the event construction activities are necessary on days or hours outside of what is specified by noise ordinance, then this would be a potentially significant impact. Project construction noise levels could result in substantial predicted increases of ambient noise levels during the daytime at some locations; therefore, on the basis of temporary ambient noise level increase, this would also be a potentially significant impact. After the implementation of APMs NOI-1 though NOI-4, Project construction noise levels would be reduced, resulting in less than substantial increases in ambient noise levels during the daytime at residential locations; thus, after APM implementation, temporary ambient noise increase would become a less than significant impact.

In the event construction activities are necessary on days or hours outside of what is specified by noise ordinance, SCE would implement NOI-5 (After-Hours Construction) in order to reduce construction noise impacts to the extent feasible. However, despite the implementation of NOI-5, after-hours construction noise impacts would potentially be significant and unavoidable.

Anticipated vibration from Project construction activities would not result in vibration velocity levels exceeding vibration guidelines for structural damage risk and human annoyance; hence, this would be a less than significant impact. The proposed Project would not generate significant construction and operational traffic and, therefore, would not expose people to current or future transportation noise levels that exceed applicable standards. This is a less than significant impact.

Project operation could generate transmission line corona AN that would, only under “foul” weather conditions (i.e., rain or related conditions that wet the conductor surface), result in short-term, temporary instantaneous noise levels in excess of local nighttime residential standards of 45 dBA L_{eq} at some representative receptor locations and a substantial but nondurable ambient noise increase of 5 dBA CNEL or greater at one representative receptor vicinity. However, under “fair” weather conditions that generally typify the Project vicinity, Project corona AN would not exceed the local day and night L_{eq} standards, nor create a substantial permanent ambient CNEL increase. And under both “fair” and “foul” conditions, corona AN is not expected to exceed

CNEL-related compatibility guidelines for residential land uses. Therefore, this is a less than significant impact.

Overall, the proposed Project, with appropriate proposed APMs, would not result in a significant impact if construction activity would be, to the extent practical, limited within the allowable hours of construction activity (and during which time construction noise limits may not be established or specified) or during periods of time that exempt construction activity noise from otherwise applicable noise level thresholds.

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APPENDIX A

NOISE DATA

CONTENTS OF APPENDIX – NOISE DATA

- Deficiency Report
- Photographic Log
- Field Noise Measurement Data Forms
- Ambient Noise Measurement Data Spreadsheet Calculations
- Corona Noise Calculation Spreadsheet
- Figure - Corona Audible Noise (AN) Survey Measurement Locations at an Existing 230 kV Line

PUBLIC UTILITIES COMMISSION

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October 8, 2015

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RE: Application Deficiency Report #2 - Certificate of Public Convenience and Necessity for the Riverside Transmission Reliability Project – Application No. A.15-04-013

Dear Mr. Forrest,

The California Public Utilities Commission's (CPUC) Energy Division CEQA Unit has completed its review of Southern California Edison's (SCE's) Application (A. 15-04-013) for a Certificate of Public Convenience and Necessity (CPCN) for the Riverside Transmission Reliability Project (RTRP) and responses to CPUC's Deficiency Report #1. The Energy Division finds that the information contained in SCE's responses to Deficiency Report #1 is incomplete and does not resolve all deficiencies in SCE's application. The attached report identifies the outstanding deficiencies in SCE's application.

Information provided by SCE in response to the Energy Division's finding of deficiency should be filed as supplements to Application A. 15-04-013. One set of responses should be sent to the Energy Division and one to our consultant Panorama Environmental, in both hardcopy and electronic format. We request that SCE respond to this report no later than December 7, 2015.

We will review the information within 30 days and determine if it is adequate to accept the application as complete. We will be available to meet with you at your convenience to discuss these items.

The Energy Division reserves the right to request additional information at any point in the application proceeding and during subsequent construction of the project should SCE's CPCN be approved.

Please direct questions related to this application to me at (415) 703-5484 or Jensen.Uchida@cpuc.ca.gov.

Sincerely,

Jensen Uchida
Project Manager
Energy Division, CEQA Unit

cc: Mary Jo Borak, Supervisor
Jack Mulligan, CPUC Attorney
Jeff Thomas, Project Manager, Panorama Environmental, Inc.

DEFICIENCY REPORT #2 FOR THE RIVERSIDE TRANSMISSION RELIABILITY PROJECT APPLICATION (A. 15-04-013)

REPORT OVERVIEW

The California Public Utilities Commission (CPUC) has identified deficiencies in Southern California Edison's (SCE's) Application (A.15-04-013) for a Certificate of Public Convenience and Necessity for the Riverside Transmission Reliability Project (RTRP). Deficiencies were identified according to requirements of the CEQA (Public Resources Code Section 21000 *et seq*.), General Order 131-D, and the Commission's Rules of Practice and Procedure for a CPCN. Deficiencies are presented in Table 1.

Table 1: SCE Riverside Transmission Reliability Project Application 15-04-013 Deficiencies

Number	Deficiency and Information Needed
1	**Provide preliminary engineering plans and a detailed route map for the entire RTRP 230 kV alignment and substations. The preliminary engineering and detailed route maps need to include the locations of all temporary and permanent work spaces including:** • **Pole work areas (e.g., crane pads)** • **Lattice steel tower work areas** • **Conductor stringing pull and tension areas** • **Guard structures** • **230-kV conductor field snub areas** • **Temporary downline, access and spur roads** • **Permanent access roads** • **Temporary staging yards** The Final EIR provides a calculated area of disturbance for each work area in Table 2.5-3a; however, there is no mapping of these work areas that show the maximum limits of the area of disturbance. Further engineering details and mapped locations of the disturbance area are required to verify the impacts to environmental resources and determine the conflicts with recent developments. As an example, the pole and work area at Wineville Avenue and Landon Drive appear to conflict with recent development in the area.
2	**Provide additional data for daytime and night-time ambient noise levels in the proposed project area, including the existing homes and development along Wineville Avenue and Landon Drive. Provide noise level measurements at similar 230-kV transmission lines near the project area. Provide noise level planning contours at distances of 50-, 100-, and 200-feet from the proposed project for construction and operation of the proposed RTRP. The planning contours for construction should include cumulative noise generated from multiple pieces of construction equipment operating simultaneously.** SCE Response to the Deficiency Report and the Final EIR both state the following with regard to construction noise, "noise would be short-term, occurring during daylight hours when the ambient noise levels are higher within the [RTRP] area". Further information is needed to define existing ambient noise levels in the project area and calculated noise

Table 1: SCE Riverside Transmission Reliability Project Application 15-04-013 Deficiencies	
Number	**Deficiency and Information Needed**
	levels at sensitive receptors along the alignment (i.e., at approved developments along the alignment). The RTRP EIR Volume 2 at pages 3-282 and 3-285 states that "Although corona noise varies widely with weather conditions and may be audible, no significant corona should be produced by lines energized below 345 kV (EPRI 1987). There would neither be a substantial nor a permanent increase in noise level." The Final EIR for the RTRP defines maximum corona noise levels during wet weather at 28 dBA; however the estimated noise level was not supported by noise measurements at similar 230-kV transmission lines in the area. Corona noise from a transmission line operating at 230-kV was measured at 29 dBA at 100 feet from the 230-kV transmission line during dry weather conditions in San Diego (SDG&E 2014). The maximum corona noise level may exceed 28 dBA at sensitive receptors. Corona noise impacts would affect a larger number of sensitive receptors than considered in the Final EIR. Sensitive receptors to noise, such as residents of the new Riverbend housing project, were not contemplated in the Final EIR impact analysis, as this housing development was not constructed or approved at the time of the Final EIR.
3	**Provide an updated Aesthetics and Visual Resources Technical Report for the 230-kV Transmission Corridor.** The 2010 Aesthetics and Visual Resources Technical Report prepared by Power Engineers needs to be updated to reflect current and future development projects along the proposed 230-kV transmission corridor. This includes updating the inventory results (scenic quality and visual integrity, sensitivity analysis), impact methods (viewshed analysis, number and location of key observation points, and photo-simulations), and impact results.
4	**Provide GIS data for utility lines in the roads that are shown as underground alternative routes. Define the size of each utility line and the spacing of existing utilities. Define utility separation requirements for the underground 230-kV transmission line.** The Deficiency Response #1, Part 6 *Riverside Transmission Reliability Project (RTRP) 230 kV Underground Alternatives Desktop Study July 2015*, identifies three potential underground alternatives and possible challenges to implementation of the alternatives. The document states, "no survey of underground utilities has been completed to date. The presence of existing underground utilities would likely impact the technical and environmental challenges associated with each undergrounding alternative." Information is required on the type and location of existing utilities to assess the feasibility of constructing an underground transmission line in any of the three alternative alignments. Provide this data for the entire transmission line alignment as it traverses Jurupa Valley, including within the Riverbend development through the existing commercial/industrial developments of the Vernola Marketplace and the business park at Landon Drive and Wineville Avenue.
5	**Provide mapped locations and GIS data for any utility lines that have been constructed within the RTRP alignment and utilities that are expected to be installed as part of the approved developments.** The Riverbend housing development is currently under construction within the RTRP Alignment. Utilities may be installed prior to NOP. Photo 1 (below) from August 18, 2015, provides evidence that infrastructure is being installed on the site. A development has already been constructed at the Wineville Avenue and Landon Drive. The locations of all utilities within the RTRP alignment is needed to evaluate impacts on utilities. **Photo 1: Riverbend Housing Development Construction**

Table 1: SCE Riverside Transmission Reliability Project Application 15-04-013 Deficiencies

Number	Deficiency and Information Needed
	
6	**Provide an assessment of the effects to population and housing from construction of the proposed route through approved Riverbend, Vernola Marketplace Apartment, William Lyon/Turnleaf and Stratham/Harmony Trails subdivisions. What is the maximum number of homes that would be displaced in these approved subdivisions?** Item #8 of the Deficiency Response #1 states: "RTRP is not expected to displace substantial numbers of existing homes necessitating the construction of homes elsewhere, and is not expected to displace substantial numbers of people." This statement is misleading because Final Maps and Grading Permits have been approved within the RTRP alignment, and in the case of William Lyon/Turnleaf, houses have been built and are occupied. The project would displace approved and constructed residential units depending on the timing of construction for RTRP and the housing developments within the RTRP alignment.
7	**Provide copies of cultural resource survey reports for the 230 kV RTRP alignment. Provide the results of a current record search through the California Historical Resources Information System (CHRIS).** The Final EIR and Administrative Record do not include the full cultural resource survey reports for the RTRP. This information is needed to verify that eligibility determinations have been made for all cultural resources consistent with the decision in Madera Oversight Coalition v. County of Madera. A current historical resources record search is required because additional resources may have been encountered and documented in the RTRP alignment during recent earthwork and mass grading for the projects within the RTRP alignment.

Table 1: SCE Riverside Transmission Reliability Project Application 15-04-013 Deficiencies	
Number	**Deficiency and Information Needed**
8	**Provide a current EDR Report for the 230 kV RTRP alignment and substations.** The previous Phase I Environmental Site Assessment (ESA) is over 1 year old and is no longer valid for the Subsequent EIR. Provide an updated Phase I ESA that documents the current status of hazardous material sites within the RTRP alignment and substations.
9	**Provide updated air quality and greenhouse gas emissions modeling for the SCE project components including the 230-kV transmission lines. Provide the model assumptions to support the model output. Provide updated air quality dispersion modeling using current air quality models and meteorological data.** The Final EIR uses old out-of-date air quality models, air quality data, and emissions factors to calculate RTRP construction emissions and evaluate impacts. The air quality and greenhouse gas emissions modeling needs to use current EMFAC2014 emissions factors. SCE's model assumptions (e.g., use of Tier 2, Tier 3, or Tier 4 equipment) and helicopter emissions modeling are also required. The Final EIR analysis of localized effects of air quality on sensitive receptors relies on ISCST3 modeling to define pollutant levels at sensitive receptors. ISCST3 is out-of-date and the California Air Resources Board (CARB) recommends use of AERMOD for dispersion modeling. The USEPA Guideline on Air Quality Models recommend that the most recent five years of consecutive meteorological data should be used for air quality modeling. Provide updated dispersion modeling using the AERMOD model and recent meteorological data.
10	**Provide information on existing and proposed right-of-way (ROW) and easements in the area where the RTRP alignment intersects with the approved projects. Identify the type of ROW (i.e., owned in fee or easement), the width of the proposed ROW, the location of the ROW relative to the property boundaries for the approved projects, and the location of the transmission line within the ROW. Identify any limitations on uses within the ROW.**
11	**Clarify how rights for access and temporary construction areas outside of the ROW will be secured.** SCE states the following regarding hazards during construction, "SCE anticipates that it will be able to construct the foundations for the tubular steel pole (TSP) and lattice steel towers (LSTs) within a 100-foot ROW". This statement appears to conflict with the work space requirements defined on page 13, where SCE indicates "Typical laydown areas for construction and assembly of TSPs are approximately 200 feet by 100 feet."
12	**Provide the basis for the 100-foot right-of-way width used for the RTRP. Does SCE have any narrower rights-of-way for 230-kV transmission lines?**

13	**Provide GIS data for the following:**
	• **Project alignment, substations, and all temporary and permanent impact areas defined in response to Item 1 above**
	• **Biological resources including**
	    o **Vegetation communities**
	    o **Special status species locations**
	    o **Jurisdictional resources**
	• **Cultural resources including**
	    o **Resource locations and boundaries**
	    o **Survey boundaries**

Table 1: SCE Riverside Transmission Reliability Project Application 15-04-013 Deficiencies	
Number	**Deficiency and Information Needed**
14	**Provide a current aerial image (georeferenced TIFF file) for the 230-kV transmission line and substations that reflects site conditions as they exist today.**
15	**Please clarify if the duct bank separation included in the desktop study is based on heat calculations using the proposed project power flow or if there is some other basis for the separation. Assuming there are no heat generating utilities adjacent to the underground duct banks, please identify the minimum ROW width (i.e., no buffer) required for the two 230-kV underground circuits.** Page 26 to 27 of the Underground Desktop Study dated July 2015 indicates that the ROW for the two 230-kV circuits would be approximately 50 feet. The study then goes on to illustrate a minimum ROW that is 40 feet; however, this width includes 10 feet of buffer on each side of the proposed duct banks. These ROW requirements appear excessive since many of the existing utilities in roadways are not heat generating.
16	**Please provide a layout of the cable vault with dimensions explaining the 48-foot length. In addition, please explain why two splice vaults are needed per circuit.** The cable vault longitudinal dimension appears excessive in view of the practices of other utilities (e.g., PG&E utilizes 25-foot long vaults for 230 kV). It appears that SCE is indicated that a separate vault would be used for each set of three cables. The reasoning for this separation is not explained and the additional vaults result in a very large amount of excavation. The additional vaults are understandable where the cables are different circuits; however, it is not clear why this is needed for the RTRP where each circuit is made up of six cables. From a worker safety perspective, when the circuit is de-energized all six cables would be out of service so it would seem there is no safety issue with locating all six cables in the same vault.
17	**Provide an explanation of the 557 MW capacity limit from Vista to serve Riverside Public Utility (RPU) demand. How many transformers at Vista are for Riverside load?** The system Information that we have for Vista shows that there are four (4) 220/66 kV transformers with a combined capacity of 1,120 MVA (4 banks at 280 MVA each). The combined capacity is increased to 1,204 (3 banks at 308 MVA + 1 bank at 280 MVA) in planning models for 2019 and beyond. What is the limiting factor or contingency? It is not clear from the 2006 Transmission Plan.
18	**Please provide a specific memo or report documenting that the CAISO directed SCE to build the RTRP in June 2006.** The CPUC has not seen any reports or documents stating that the project was approved by CAISO or that SCE was directed to build it.
19	**Please provide the SCE 2006-2027 Transmission Expansion Plan.**

Date: 11/11/15-11/12/15

Photograph 1

Site: Wineville Ave & Cantu-Galena Rd

Measurement: LT-1

(View NE)

Date: 11/11/15-11/12/15

Photograph 2

Site: Wineville Ave & Cantu-Galena Rd

Measurement: LT-1

(View SE)

Date: 11/11/15-11/12/15

Photograph 3

Site: Hidden Valley Wildlife Area

Measurement: LT-2

(View N)

Date: 11/11/15-11/12/15

Photograph 4

Site: Hidden Valley

Measurement: LT-2

(View W)

Date: 11/12/15

Photograph 5

Site: Wineville Ave & Cantu-Galena Rd

Measurement: ST-1

(View S)

Date: 11/12/15

Photograph 6

Site: Wineville Ave & Cantu-Galena Rd

Measurement: ST-1

(View E)

Date: 11/12/15

Photograph 7

Site: Wineville Ave and Landon Dr.
Measurement: ST-2

(View E)

Date: 11/12/15

Photograph 8

Site: Wineville Ave and Landon Dr.

Measurement: ST-2

(View S)

Date: 11/12/15

Photograph 9

Site: Landon Drive.across from the UPS entrance

Measurement: ST-3

(View S)

Date: 11/12/15

Photograph 10

Site: Landon Drive.across from the UPS entrance

Measurement: ST-3

(View W)

Date: 11/12/15

Photograph 11

Site: Wineville Ave and Park Center Drive

Measurement: ST-4

(View W)

Date: 11/12/15

Photograph 12

Site: Wineville Ave and Park Center Drive
Measurement: ST-4

(View ENE)

Date: 11/12/15
Photograph 13

Site: Park and Ride off of Limonite

Measurement: ST-5

(View E)

Date: 11/12/15

Photograph 14

Site: Park and Ride off of Limonite

Measurement: ST-5

(View S)

Date: 11/12/15

Photograph 15

Site: 68th St. and Carnelian St.

Measurement: ST-6

(View S)

Date: 11/12/15
Photograph 16

Site: 68th St. and Carnelian St.

Measurement: ST-6

(View W)

Date: 11/12/15
Photograph 17

Site: Golf Course on 68th St.@ Dana Ave

Measurement: ST-7

(View S)

Date: 11/12/15

Photograph 18

Site: Golf Course on 68th St.@ Dana Ave

Measurement: ST-7

(View E)

Date: 11/12/15

Photograph 19

Site: Grulia Ct

Measurement: ST-8

(View W)

Date: 11/12/15

Photograph 20

Site: Grulia Ct

Measurement: ST-8

(View S)

Date: 11/12/15

Photograph 21

Site: Hidden Valley Wildlife Area

(Collocated with LT-2)

Measurement: ST-9

(View E)

Date: 11/12/15

Photograph 22

Site: Hidden Valley Wildlife Area

(Collocated with LT-2)

Measurement: ST-9

(View N)

Date: 11/11/15

Photograph 23

Site: Crest Ave and Julian St

Measurement: ST-10

(View S)

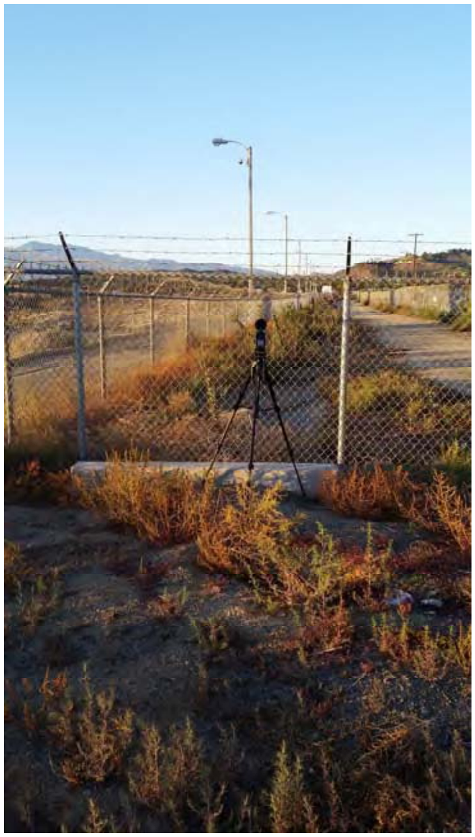
Date: 11/11/15

Photograph 24

Site: Crest Ave and Julian St

Measurement: ST-10

(View E)



Date: 11/11/15

Photograph 25

Site: The end of Payton St.

Measurement: ST-11

(View N)

Date: 11/11/15

Photograph 26

Site: The end of Payton St.

Measurement: ST-11

(View W)

AECOM

Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: ______ Date: 11/11/15 Page 1 of 1

Monitoring Location: LT 1 Wineville Ave/Canto Galeano Analyst: JG/JR

Sound Level Meter	Field Calibration	Weather Data
Model #: LD 820	Model #: LD CAL200	Model #: KESTREL 3000
Serial #: 1414	Serial #: 12226	Serial #: 1662806
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / 114	Wind: Steady / (Gusty) / Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.0 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.3 dBA	Avg Wind Speed/Direction: 4-5 mph
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 74 RH (%): ~~46~~ 23
Terrain: Hard/Soft/(Mixed)/Snow	3400394 -117.54235	Bar Psr (Hg): 497 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Classification Count	Notes/Events
~~LT-1~~	~~11:45a~~									heavy truck traffic
LT-1	12:05 (11/11/15)	13:25 (11/12/15)								

Roadway Name/Dir	CANTO GALEANO	WINEVILLE AVE
Speed (post/obs)*	45	
Number of Lanes	4	6
Width (pave/row)	-	
1- or 2- way		
Grade	0%	0%
Bus Stops	X	X
Stoplights	✓	✓
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant (aircraft) / (roadway traffic) TRAFFIC / trains / landscaping / (rustling leaves) / children playing / dogs barking / birds vocalizing / Insects

Additional Notes and Sketches on Reverse

includes ST-9 night

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

11/12/15

Project Name: RTRP Project #: ______ Date: 11/11/15 Page 1 of 1

Monitoring Location: LT-2 Analyst: J. Goodson / J. Redmond

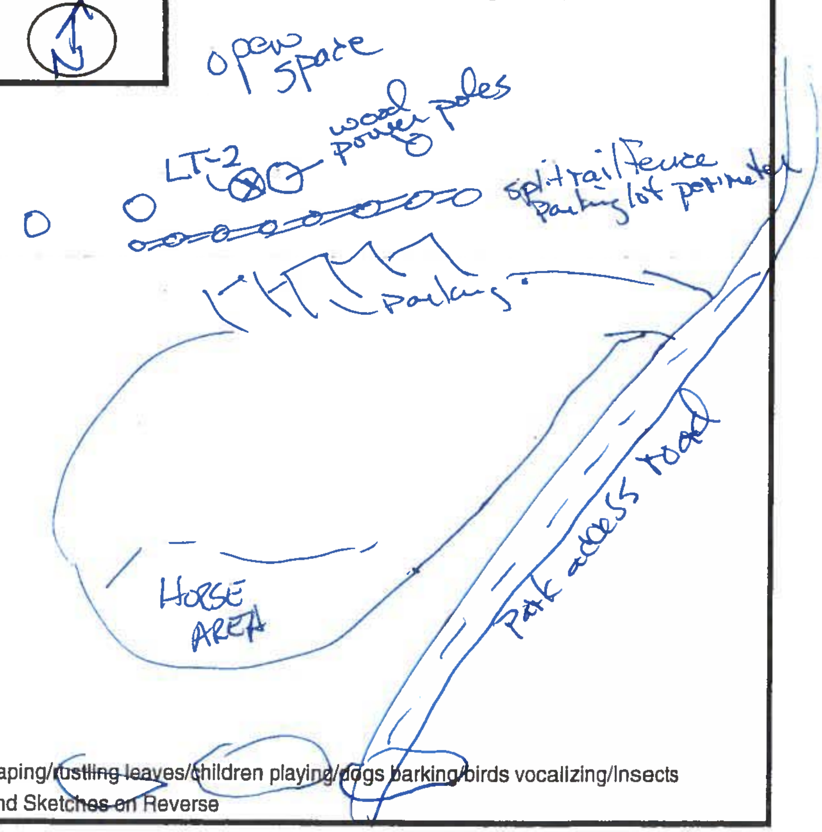
Sound Level Meter	Field Calibration	Weather Data
Model #: LD 820	Model #: CAL 200	Model #: Kestral 3500
Serial #: 1324	Serial #: 12226	Serial #: 2058303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/(Gusty)/Calm 15 mph
Response: (Slow) / Fast / Impl	Pre-Test 114.1 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.1 dBA	Avg Wind Speed/Direction: 4.9 / NE
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#	Temp (°F): 79.7 RH (%): 12.5
Terrain: Hard/(Soft)/Mixed/Snow	33.95982 -117.51519	Bar Psr (Hg): 996.3 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
LT-2	2:40pm (11/11/15)	3:45pm (11/12/15)							Strong gusty winds at start of measurement

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: (aircraft)/(roadway traffic)/trains/landscaping/~~rustling leaves~~/(children playing)/(dogs barking)/birds vocalizing/Insects (WIND)

Additional Notes and Sketches on Reverse

DAY

URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP
Project #:
Date: 11/12/15
Page 1 of 1

Monitoring Location: ST-1 (DAY) Wineville @ Cantu Galleano
Analyst: J. GOODSON J Redmond

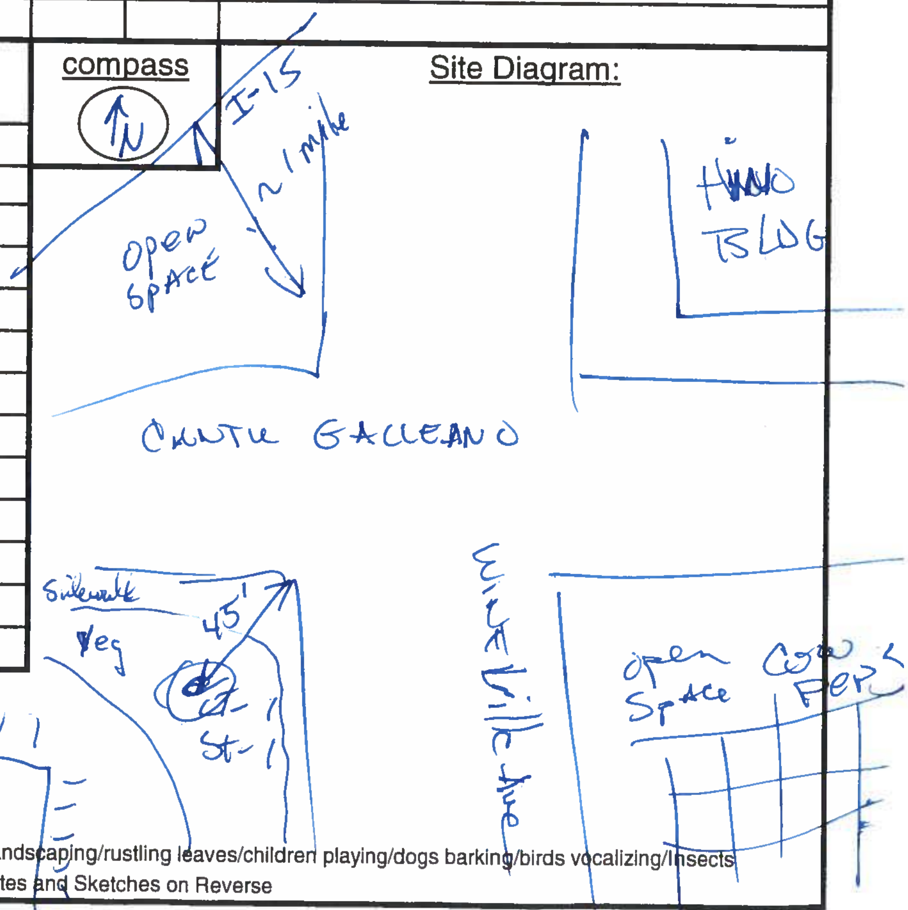
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12224	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady) / Gusty / Calm
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.9 dBA	Avg Wind Speed/Direction: 1-3 W
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)[#]	Temp (°F): 81 RH (%): 18.7
Terrain: Hard / Soft / (Mixed) / Snow	34.00402 -117.5457	Bar Psr (Hg): 990 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-1	13:10	13:25							Continuous truck and vehicle traffic on W Neville @ Cantu Galleano

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes) / No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

Night

URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP   Project #: ______   Date: 11/12/15   Page 1 of 1

Monitoring Location: ST- (Night) Wine Ville @ Cantu Galleano   Analyst: J. Goodson J. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LXT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4455	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady)/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.94 dBA	Avg Wind Speed/Direction: 1-2 mph NE
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 52.4 RH (%): 42.5
Terrain: Hard/Soft/(Mixed)/Snow	34.00402 -117.54257	Bar Psr (Hg): 995 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-1	2:35 am	2:50 am							2:37 jet flyover
									steady mild traffic; cars and
									~ big rig trucks
									2:46 train horn

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

See ST-1 DAY

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No)

Additional Notes/Comments:

Other Noise Sources: distant (aircraft)/(roadway traffic)/(trains)/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/Insects

Additional Notes and Sketches on Reverse

DAY

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP　　Project #:　　Date: 11/12/15　　Page 1 of 1

Monitoring Location: ST-2 (DAY) Landon @ Wineville　　Analyst:

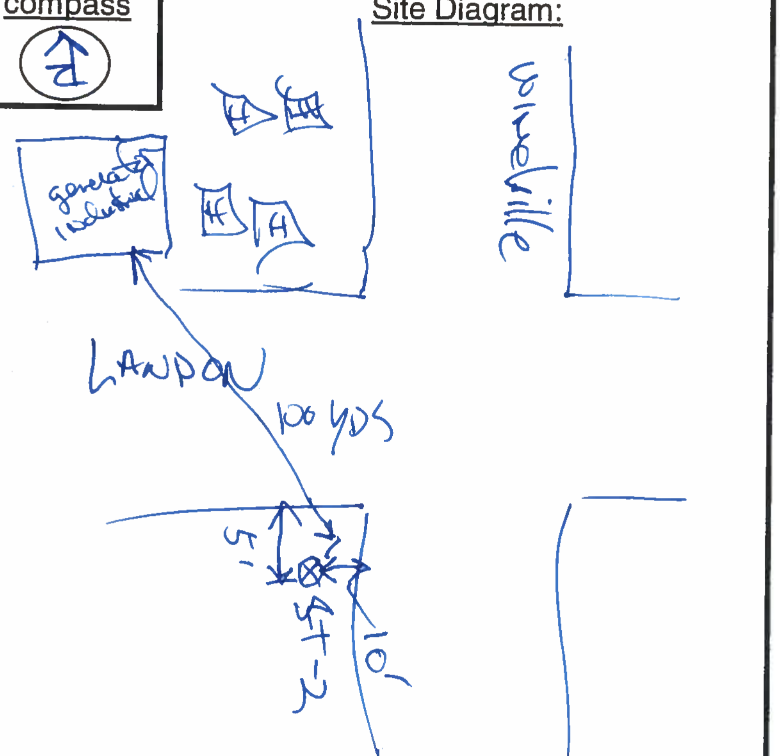
Sound Level Meter		Field Calibration		Weather Data	
Model #:	LD LxT	Model #:	LD 200	Model #:	Kestral 3500
Serial #:	4845	Serial #:	12226	Serial #:	2068303
Weighting:	(A) / C / Flat	Calibration Level (dBA):	94 / (114)	Wind:	(Steady) / Gusty / Calm
Response:	(Slow) / Fast / Impl	Pre-Test	113.9 dBA	Precipitation:	Yes (explain) / (No)
Windscreen:	(Yes) / No (explain)	Post-Test	113.9 dBA	Avg Wind Speed/Direction:	2-3 W
Topo:	(Flat) / Hilly	GPS Coordinates (at SLM location)#	33.99802 - 117.54232	Temp (°F):	81
Terrain:	Hard/Soft/(Mixed)/Snow			RH (%):	18.7
				Bar Psr (Hg):	990
				Cloud Cover (%):	0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-2	12:45	1:00							continuous generator noise from industrial facility
									continuous traffic on Wineville
									and truck traffic on LANDON

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



\# - note coordinate system　* - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/Insects

Industrial generator

Additional Notes and Sketches on Reverse

Night

AECOM Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP | Project #: | Date: 11/12/15 | Page 1 of 1

Monitoring Location: ST-2 (Night) Wineland @ Landon | Analyst: J. Goodson J Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: A / C / Flat (A circled)	Calibration Level (dBA): 94 / 114 (114 circled)	Wind: Steady/Gusty/Calm (Steady circled)
Response: Slow / Fast / Impl (Slow circled)	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / No (No circled)
Windscreen: Yes / No (explain) (Yes circled)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: 1-2 mph NE
Topo: Flat / Hilly (Flat circled)	GPS Coordinates (at SLM location)#	Temp (°F): 52.4 RH (%): 42.5
Terrain: Hard/Soft/Mixed/Snow (Mixed circled)	33.99802 -117.54232	Bar Psr (Hg): 995.1 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-2	2:10	2:25							Continuously running truck 50 yds
									2:12 passing by big truck
									2:14 plane fly over
									2:20 train horn
									2:22 train horn
									2:23 jet flyover

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

See ST-2 Day

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No (No circled)

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects (roadway traffic, trains, insects circled)

Additional Notes and Sketches on Reverse

DAY

AECOM

Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP   Project #: ______   Date: 11/12/15   Page 1 of 1

Monitoring Location: ST-3 (DAY) LANDON off Winchville   Analyst: J. GOODSON - J. REDMOND

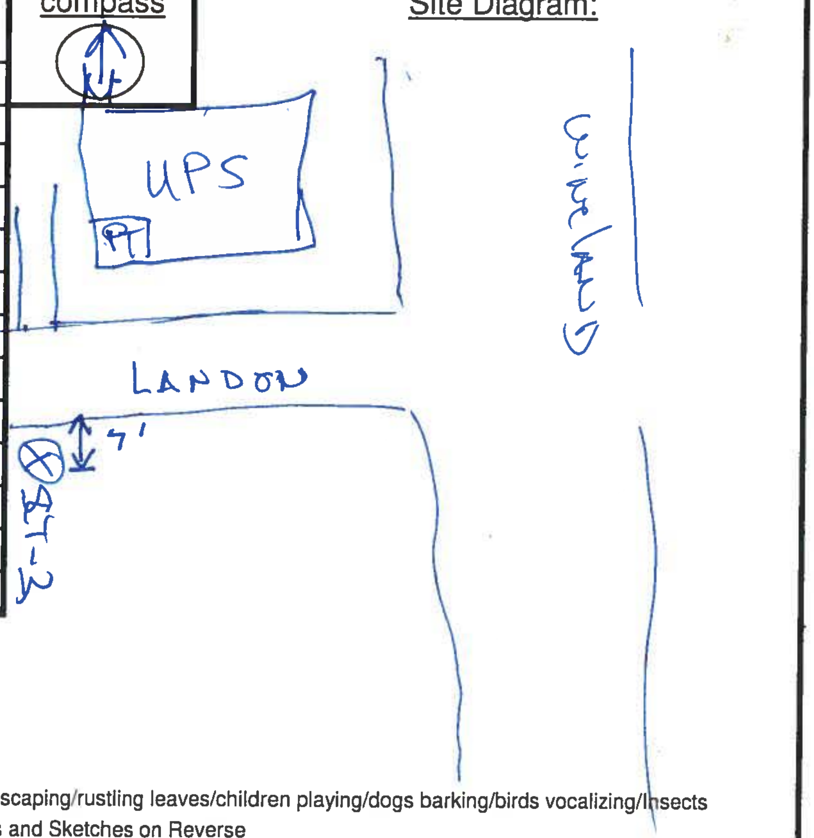
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LXT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady)/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.9 dBA	Avg Wind Speed/Direction: 2-3 W
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#: 33.99810 -117.54510	Temp (°F): 81 RH (%): 18.7
Terrain: Hard/Soft/(Mixed)/Snow		Bar Psr (Hg): 990 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Classification Count	Notes/Events
ST3	12:25	12:40								12:25 Brakes airplane traffic backup alarms

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant (aircraft)/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

night

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: ______ Date: 11/12/15 Page 1 of 1
Monitoring Location: ST-3 (night) Landon off Wilderness Analyst: J. Goodson, J. Redmond

Sound Level Meter		Field Calibration		Weather Data	
Model #:	LD LxT	Model #:	LD 200	Model #:	Kestrel 3500
Serial #:	4885	Serial #:	12226	Serial #:	2068303
Weighting:	(A) / C / Flat	Calibration Level (dBA):	94 / (114)	Wind:	(Steady)/Gusty/Calm
Response:	(Slow) / Fast / Impl	Pre-Test	114.04 dBA	Precipitation:	Yes (explain) / (No)
Windscreen:	(Yes) / No (explain)	Post-Test	114.04 dBA	Avg Wind Speed/Direction:	1-2 mph
Topo:	(Flat) / Hilly	GPS Coordinates (at SLM location)#		Temp (°F):	52.5; RH (%): 42.6
Terrain:	Hard/Soft/(Mixed)/Snow	33.99810 -117.54510		Bar Psr (Hg):	29.98; Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-3	01:50	02:04							01:50 train horn
									01:54 passing big rig truck
									01:55 passing big rig truck
									-continuous idling big rig parked
									approx 70 yds away

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

See ST-3 day

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No)

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

Day

AECOM

Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: ______ Date: 11/12/15 Page 1 of 1

Monitoring Location: ST-4 (Day) Wineville / Park Center Analyst: J. GOODSON J REDMOND

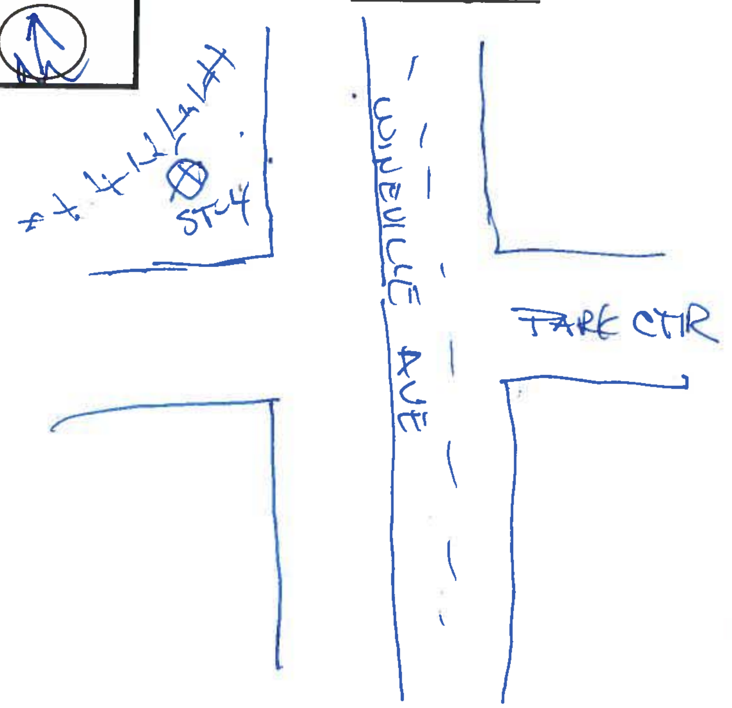
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestrel 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady) / Gusty / Calm
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.9 dBA	Avg Wind Speed/Direction: 2-4 W
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#: 33.98549 -117.54090	Temp (°F): 77.8 RH (%): 17.0
Terrain: Hard/Soft/(Mixed)/Snow		Bar Psr (Hg): 992.5 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Classification Count	Notes/Events
ST-4	12:00	12:15								12:03 Dump truck dumping load

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



\# - note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes) / No

Additional Notes/Comments:

Other Noise Sources: distant aircraft / (roadway traffic) / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing / Insects
construction activity

Additional Notes and Sketches on Reverse

Night

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP | Project #: | Date: 11/12/15 | Page 1 of 1
Monitoring Location: ST-4 (night) Wineville/Park Center Drive | Analyst: J. Goodson/J. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: CD LXT	Model #: CD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: A / C / Flat (A circled)	Calibration Level (dBA): 94 / 114 (114 circled)	Wind: Steady/Gusty/Calm (Steady circled)
Response: Slow / Fast / Impl (Slow circled)	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / No (No circled)
Windscreen: Yes / No (explain) (Yes circled)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: 1-3 N
Topo: Flat / Hilly (Flat circled)	GPS Coordinates (at SLM location)#: 33.98549 -117.54090	Temp (°F): 52.3 RH (%): 36.0
Terrain: Hard/Soft/Mixed/Snow (Mixed circled)		Bar Psr (Hg): 995.8 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-4	01:25	01:40							01:30 train horn
									01:31 passing car
									01:32 passing car
									01:37 passing car
									01:40 passing car

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram: See ST-__ Night

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No (No circled)

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects (roadway traffic, trains, dogs barking circled)

Additional Notes and Sketches on Reverse

Day

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: ______ Date: 11/12/15 Page 1 of 1

Monitoring Location: ST-5 (DAY) Park & Ride Analyst: J. Goodson, J. Redmond

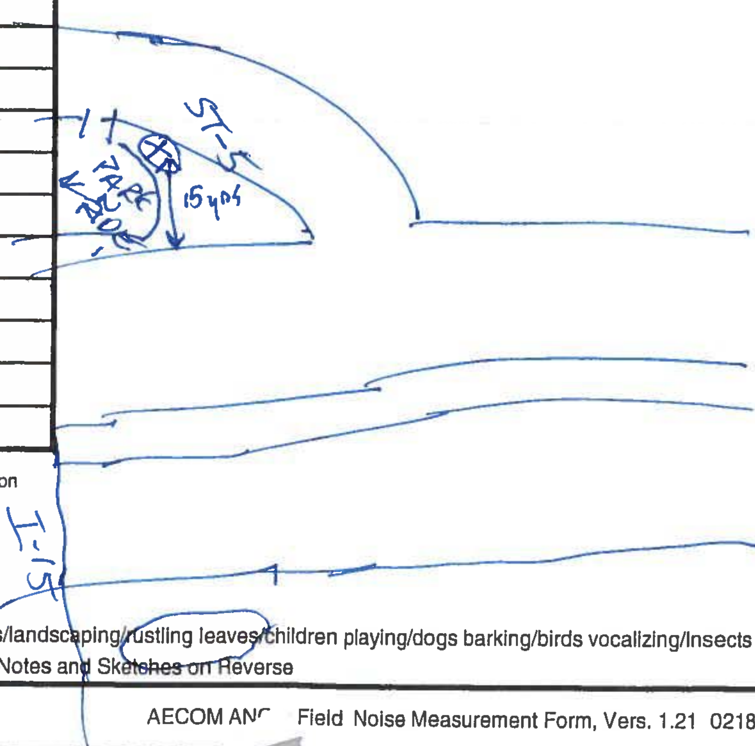
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady)/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.9 dBA	Avg Wind Speed/Direction: 2-3 mph W
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 76 RH (%): 14.4
Terrain: (Hard)/Soft/Mixed/Snow		Bar Psr (Hg): 29.4 / Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST	11:20	11:45							continuous traffic on Limonite

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system ; * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/(rustling leaves)/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

Night

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: ______ Date: 11/12/15 Page 1 of 1

Monitoring Location: ST-5 (Night) (PARK + RWE) Analyst: J. Godson / J. Redmond

Sound Level Meter		Field Calibration		Weather Data	
Model #:	LD LXT	Model #:	LD 200	Model #:	Kestrel 3500
Serial #:	4885	Serial #:	12226	Serial #:	2068303
Weighting: (A) / C / Flat		Calibration Level (dBA): 94 / (114)		Wind: Steady/Gusty/Calm	
Response: (Slow) / Fast / Impl		Pre-Test	114.04 dBA	Precipitation: Yes (explain) / (No)	
Windscreen: (Yes) / No (explain)		Post-Test	114.04 dBA	Avg Wind Speed/Direction:	3-5 mph
Topo: (Flat) / Hilly		GPS Coordinates (at SLM location)[#]		Temp (°F): 53.3	RH (%): 34.0
Terrain: (Hard) / Soft/Mixed/Snow		33.97558 -117.54553		Bar Psr (Hg): 98.9	Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST	01:00	01:15							continuous low volume passing cars with brief periods of no cars. 01:10 airplane flyover

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

SEE ST-5 DAY Sheet

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No)

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects

Additional Notes and Sketches on Reverse

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP (Day) Project #: Date: 11/12/15 Page 1 of 1
Monitoring Location: ST-6 Carnelian St (School) Analyst: J. Goodson J Redmond

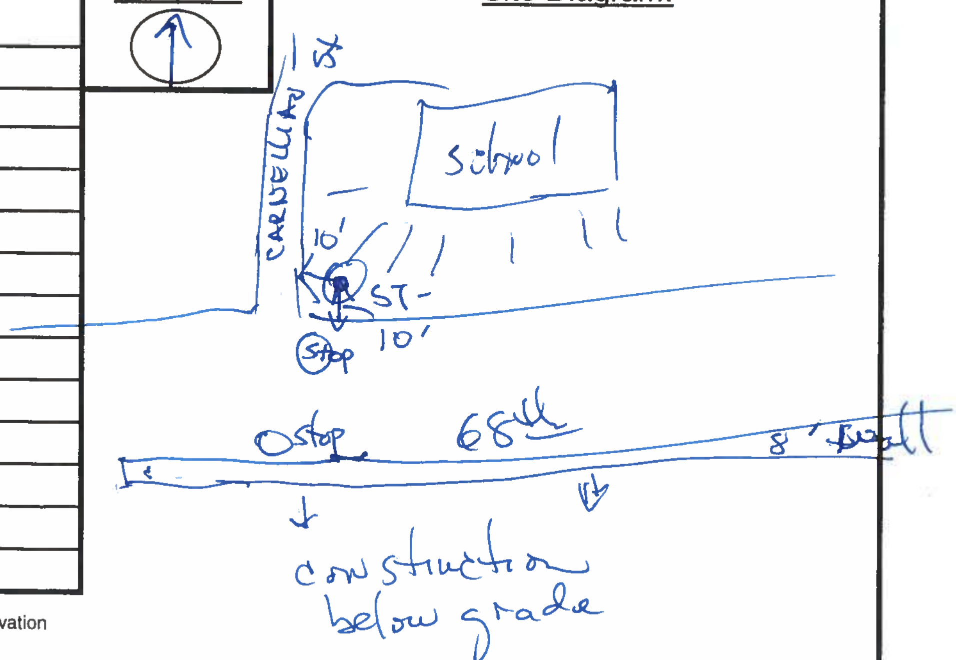
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LXT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/Gusty/(Calm)
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) (No)
Windscreen : (Yes) / No (explain)	Post-Test 114.1 dBA	Avg Wind Speed/Direction: 1 mph N
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 77 RH (%): 23
Terrain: (Hard)/Soft/Mixed/Snow	33.93727 -117.54261	Bar Psr (Hg): 992.6 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-	15:10	15:25							Continuous traffic, come to stop @ 68th/Carnelian St, accelerate

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/Insects (construction)

Additional Notes and Sketches on Reverse

Night

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP | Project #: | Date: 11/12/15 | Page of

Monitoring Location: ST-6 (Night) Carnelian (School) | Analyst: J. Goodson / B. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LXT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4685	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady)/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / (No)
Windscreen (Yes) / No (explain)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: 2-3 mph
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 55.3 RH (%): 27.7
Terrain: (Hard)/Soft/Mixed/Snow	33.96472 -117.54343	Bar Psr (Hg): 998.0 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST	00:35	00:50							00:38 passing car
									00:44 passing car
									00:45 passing car

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No)

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/(dogs barking)/birds vocalizing/insects

Additional Notes and Sketches on Reverse

Day

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP   Project #: ______   Date: 11/12/15   Page 1 of 2

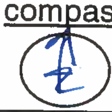
Monitoring Location: ST-7 (Day) / Golf Course   Analyst: J. Goodson / Fred Mold

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4985	Serial #: 12226	Serial #: 206 6303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/Gusty/(Calm)
Response: (Slow) / Fast / Impl	Pre-Test 113.9 ~~114.04~~ dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.9 dBA	Avg Wind Speed/Direction: 1mph N
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#: 33.96452 -117.53417	Temp (°F): 87.6 RH (%): 13.1
Terrain: Hard/Soft/(Mixed)/Snow		Bar Psr (Hg): 992.8 Cloud Cover (%): 10

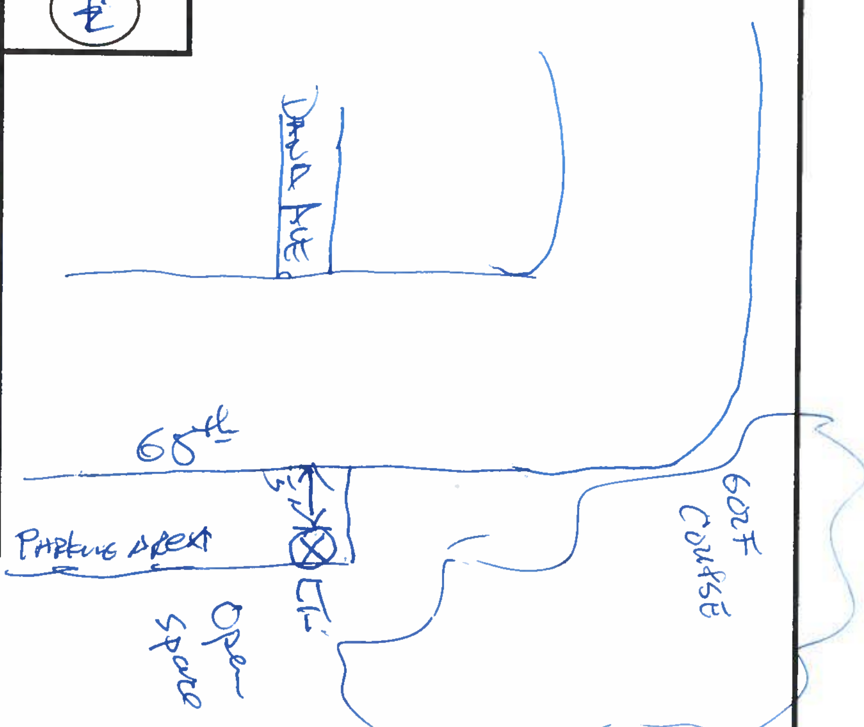
ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-	13:55	14:10							13:55 airplane flyover
									13:56 passing car
									14:04 airplane flyover

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass



Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: (aircraft)/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/Insects

Additional Notes and Sketches on Reverse

Night

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: Date: 11/12/15 Page 1 of 1

Monitoring Location: ST-7 (Night) Golf Course Analyst: J. Goodson/J. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: ±3 mph E
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#	Temp (°F): 59 RH (%): 26.2
Terrain: Hard/Soft/(Mixed)/Snow	33.96452 -117.53417	Bar Psr (Hg): 998.5 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-	00:10	00:25							00:18 plane flyover
									00:23 plane flyover

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No) See Daytime ST-

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/(rustling leaves)/children playing/(dogs barking)/birds vocalizing/Insects

Additional Notes and Sketches on Reverse

DAY

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: Date: 11/12/15 Page 1 of 1

Monitoring Location: ST-8 (DAY) Gruella Ct off Pinto Ln Analyst: J. GOODSON J REDMOND

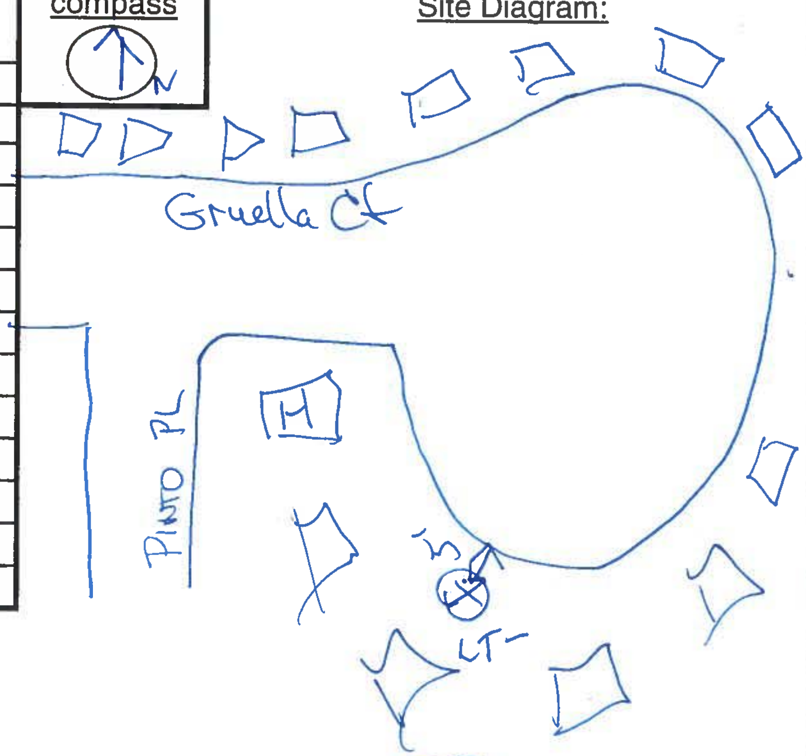
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4488	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 113.9 dBA	Avg Wind Speed/Direction: 3 mph NW
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)[#]	Temp (°F): 80 RH (%): 13
Terrain: (Hard)/Soft/Mixed/Snow	33.93727 -117.54261	Bar Psr (Hg): 29.8 Cloud Cover (%): 10

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-	14:35	14:50							14:37 airplane flyover
									14:42 airplane "
									14:45 airplane "
									14:48 helicopter "

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/(dogs barking)/birds vocalizing/Insects

Additional Notes and Sketches on Reverse

Night

URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP   Project #: ______   Date: 11/11/15   Page 1 of 1

Monitoring Location: ST. 8 (Night) Gruella Ct off Pinto   Analyst: J. Goodson / J. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestrel 3500
Serial #: 4885	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady) / Gusty / Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: 1-3
Topo: (Flat) / Hilly	GPS Coordinates (at SLM location)#	Temp (°F): 66 RH (%): 19.6
Terrain: (Hard) / Soft / Mixed / Snow	33.95727 -117.54261	Bar Psr (Hg): 96.3 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST	23:30	23:45							23:31 dogs barking

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No) See daytime ST-__ Measurement

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/(rustling leaves)/children playing/(dogs barking)/birds vocalizing/insects

Additional Notes and Sketches on Reverse

day

AECOM Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP | Project #: | Date: 11/11/15 | Page 1 of

Monitoring Location: ST-9 (Day) (~~next~~ @ LT-2) | Analyst: J. Goodson / J. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: 200	Model #: Kestrel 3500
Serial #: 4885	Serial #: 12226	Serial #: 2058303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/(Gusty)/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.01 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.01 dBA	Avg Wind Speed/Direction: 4-15 / NE
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#	Temp (°F): 74 RH (%): 12
Terrain: Hard/(Soft)/Mixed/Snow	~~35.38328~~ 33.95982 -117.51519	Bar Psr (Hg): 996 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-	15:05	15:20							strong gusty winds during measurement
	~~15:10~~								313 AIRPLANE
	~~15:15~~								314 PEOPLE WALKING + TALKING
	15:20								315 PEOPLE, SLAMMING port-o-john

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

see LT-2 (Hidden Valley Ranch Park)

\# - note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/No

Additional Notes/Comments: people walking

Other Noise Sources: distant (aircraft)/roadway (traffic)/trains/landscaping/(rustling leaves)/(children playing)/(dogs barking)/birds vocalizing/insects (wind)

Additional Notes and Sketches on Reverse

DAY

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP Project #: ______ Date: 11/11/15 Page 1 of ___

Monitoring Location: ST-10 (DAY) Julian Dr. Crest Ave Analyst: J. Goodson / J. Redmond

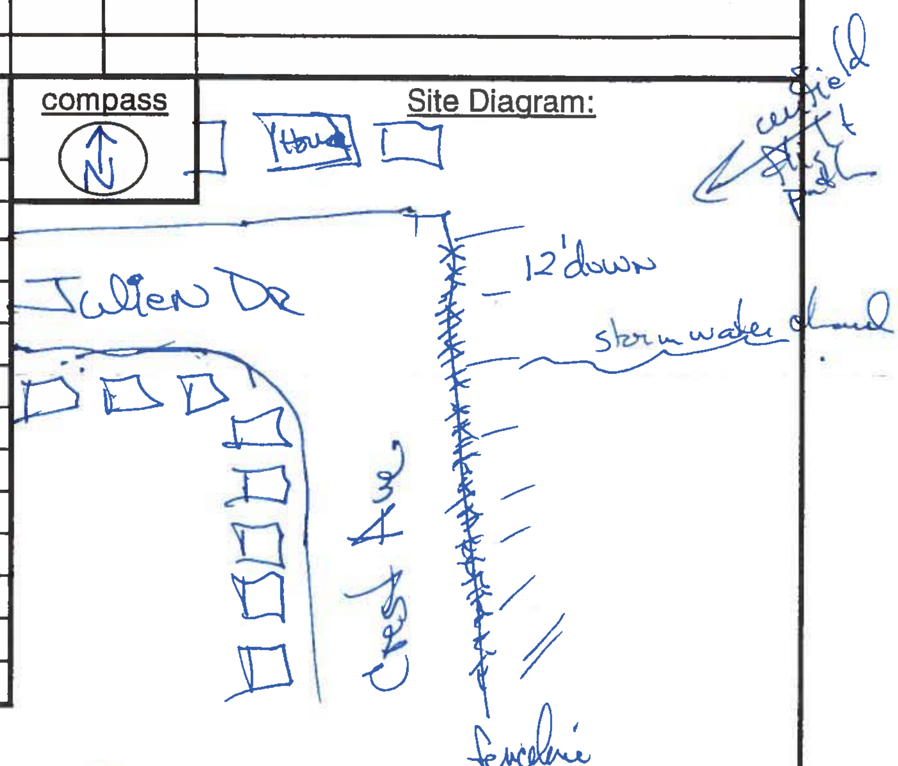
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LXT	Model #: LD 200	Model #: Kestrel 3500
Serial #: 4645	Serial #: 12226	Serial #: 2058303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/(Gusty)/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.01 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.16 dBA	Avg Wind Speed/Direction: 6-11 N
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#	Temp (°F): 70 RH (%): 13.9
Terrain: Hard/Soft/(Mixed)/Snow	33.96106 -117.47441	Bar Psr (Hg): 993.5 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST	16:55	17:10		[illegible]					16:56 small airplane flyover
									16:57 car drive by
									16:59 motorcycle
									17:02 plane flyover / car passing
									17:03 car passing
									17:05 car passing

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments: near airfield (numerous takeoffs before sundown (5 pm))

Other Noise Sources: distant: (aircraft)/(roadway traffic)/trains/landscaping/(rustling leaves)/(children playing)/(dogs barking)/birds vocalizing/(insects)

Additional Notes and Sketches on Reverse

Night

URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP | Project #: | Date: 11/11/15 | Page 1 of

Monitoring Location: ST-10 (Night) Julien Dr / Crest Ave | Analyst: J. Goodson / [illegible]. Pedmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestrel 3500
Serial #: 4485	Serial #: 12226	Serial #: 2068303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: (Steady)/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: 3 mph
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#	Temp (°F): 55 RH (%): 29
Terrain: Hard/Soft/(Mixed)/Snow	33.9606 -117.47441	Bar Psr (Hg): 995 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
LT	22:55	23:10							22:55 train horn
									22:59 train horn
									23:07 airplane jet

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram: see ST-10 Day

\# - note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No) see ST-__ Day

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/(roadway traffic)/(trains)/landscaping/(rustling leaves)/children playing/(dogs barking)/birds vocalizing/Insects

Additional Notes and Sketches on Reverse

DAY

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: RTRP   Project #: ______   Date: 11/11/15   Page 1 of ___

Monitoring Location: ST- 11 (DAY) Industrical Payton St   Analyst: J. Goodson / J. Redmond

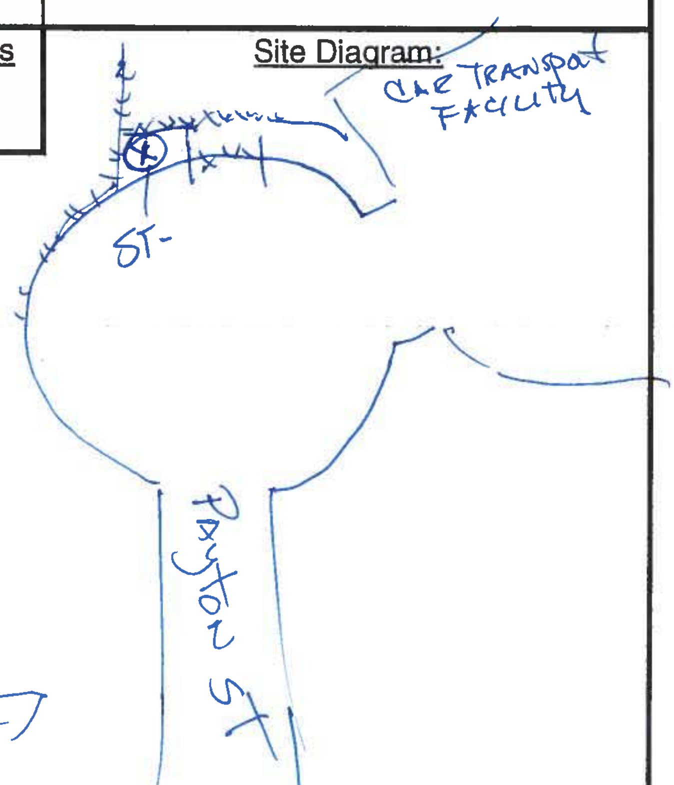
Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2058303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady / (Gusty) / Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.01 dBA	Precipitation: Yes (explain) / (No)
Windscreen: (Yes) / No (explain)	Post-Test 114.16 dBA	Avg Wind Speed/Direction: 5-10 mph / NE
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)#: 33.96258 -117.45180	Temp (°F): 71 RH (%): 14.5
Terrain: (Hard) / Soft / (Mixed) / Snow		Bar Psr (Hg): 993.0 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST-	16:25	16:40							1625 - car 1626 car horn
									1627 – plane flyover (small) low
									1628 – plane flyover (small) low
									16:31 – plane flyover (small) low
									16:32 – plane flyover (small) low
									16:38 – truck (car transport
									16:37 – backup beeping truck
									16:38 to the south construction
									16:39 plane flyover (small - low)

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:



- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes) / No

AIRCraft approach →

Additional Notes/Comments:

Other Noise Sources: distant: (aircraft) / (roadway traffic) / (trains) / (landscaping) / (rustling leaves) / children playing / dogs barking / birds vocalizing / insects

Additional Notes and Sketches on Reverse

Night

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: KTRP Project #: ______ Date: 11/11/15 Page 1 of 1
Monitoring Location: ST-11 (Night) industrial Analyst: J. Goodson / J. Redmond

Sound Level Meter	Field Calibration	Weather Data
Model #: LD LxT	Model #: LD 200	Model #: Kestral 3500
Serial #: 4885	Serial #: 12226	Serial #: 2058303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 114.04 dBA	Precipitation: Yes (explain) / No
Windscreen: (Yes) / No (explain)	Post-Test 114.04 dBA	Avg Wind Speed/Direction: 3-6 NE
Topo: Flat / (Hilly)	GPS Coordinates (at SLM location)[#]	Temp (°F): 57.6 RH (%): 25
Terrain: (Hard/Soft/Mixed)/Snow	33.96258 -117.45180	Bar Psr (Hg): 994.5 Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events
ST	2230	2245							Construction Noise to the North
									HVAC to the South
									highway traffic
									22:44 car beeping horn

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

See DAY ST-11 DAY

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant; aircraft/(roadway traffic)/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/Insects
(HVAC) (Construction) (industrial operations)

Additional Notes and Sketches on Reverse

URS Acoustics and Noise Control Practice

FIELD NOISE MEASUREMENT DATA FORM

Project Name: SCE RTRP CWA #8 Project #: ______ Date: 11/21/15 Page 1 of 3

Monitoring Location: EUCALYPTUS AVE. AT 200' Analyst:

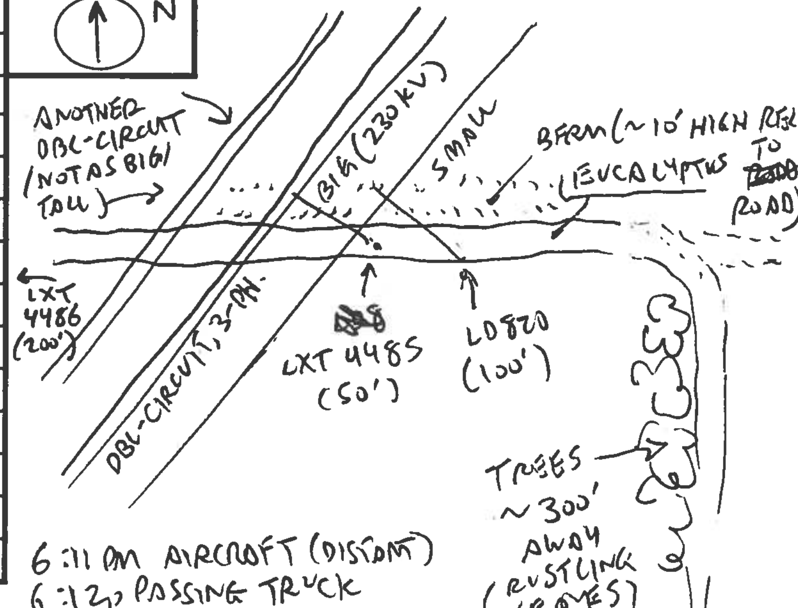
Sound Level Meter		Field Calibration		Weather Data	
Model #:	LXT	Model #:	CAL200	Model #:	KESTREL 3500
Serial #:	4486	Serial #:	12226	Serial #:	2058303
Weighting: (A) / C / Flat		Calibration Level (dBA): 94 / (114)		Wind: (Steady) / Gusty / Calm	(TIME TAKEN: 6:30 pm)
Response: (Slow) / Fast / Impl		Pre-Test	+0.24 dBA	Precipitation: Yes (explain) / (No)	
Windscreen: (Yes) / No (explain)		Post-Test	+0.30 dBA	Avg Wind Speed/Direction:	6.6 mph E
Topo: ~~Flat / Hilly~~ → BERM		GPS Coordinates (at SLM location)#		Temp (°F): 73.5	RH (%): 18
Terrain: Hard/Soft/(Mixed)/Snow				Bar Psr (Hg):	Cloud Cover (%): Ø

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass (↑ N)

Site Diagram:



6:11 pm AIRCRAFT (DISTANT)
6:12p PASSING TRUCK

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No – AUDIBLE CORONA CRACKLE/BUZZ THROUGHOUT MEAS.

Additional Notes/Comments: – OCCASIONAL DISTANT HIGH SCHOOL SPORTING EVENT PA (CARRIED BY WIND?)

6:28p PASSING PICKUP TRUCK; 6:23-6:24 AIRCRAFT TO NORTH; 6:17 AIRCRAFT, 6:21 AIRCRAFT TO SOUTH

Other Noise Sources: distant: aircraft/(roadway traffic)/trains/landscaping/(rustling leaves)/children playing/dogs barking/(birds vocalizing)/Insects

↑ AIRCRAFT ABOVE (HIGH ALT.)

Additional Notes and Sketches on Reverse

URS Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: SCE RTRP CWA #8 Project #: ______ Date: 11/21/15 Page 2 of 3
Monitoring Location: EUCALYPTUS AVE. AT 50' Analyst: SOBM / KAISER

Sound Level Meter		Field Calibration		Weather Data	
Model #:	LXT	Model #:	CAL200	Model #:	KESTREL 3500
Serial #:	4485	Serial #:	12226	Serial #:	2058303
Weighting: (A) / C / Flat		Calibration Level (dBA): 94 / (114)		Wind: (Steady)/Gusty/Calm	(TIME TAKEN: 6:00 pm)
Response: (Slow) / Fast / Impl		Pre-Test	+0.42 dBA	Precipitation: Yes (explain) / (No)	
Windscreen: (Yes) / No (explain)		Post-Test	-0.05 dBA	Avg Wind Speed/Direction:	7.5 mph E
Topo: Flat / (Hilly) ← BERM		GPS Coordinates (at SLM location)#		Temp (°F): 75	RH (%): 17
Terrain: Hard/Soft/(Mixed)/Snow				Bar Psr (~~Hg~~): 989 hPa	Cloud Cover (%): 0

ID	Start Time	Stop Time	L_{eq}	L_{min}	L_{max}	L_{10}	L_{50}	L_{90}	Notes/Events

Roadway Name/Dir		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

~~Site Diagram:~~
LD 820 (SN 1655) PRE: CAL 113.9
POST-CAL: 114.0

\# - note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? (Yes)/No

Additional Notes/Comments:

Other Noise Sources: distant: aircraft/roadway traffic/trains/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/Insects

Additional Notes and Sketches on Reverse

AECOM Acoustics and Noise Control Practice
FIELD NOISE MEASUREMENT DATA FORM

Project Name: SCE RTRP Project #: ______ Date: 11/21/15 Page 3 of 3

Measurement/Monitoring Location: EUCALYPTUS AT 100' Analyst: STORM / KAISER

Sound Level Meter	Field Calibration	Weather Data
Model #: LD 820	Model #: CAL200	Model #: KESTREL 3500 Time Obs/Meas:
Serial #: 1655 ~~[illegible]~~	Serial #: 12226	Serial #: 2058303
Weighting: (A) / C / Flat	Calibration Level (dBA): 94 / (114)	Wind: Steady/Gusty/Calm
Response: (Slow) / Fast / Impl	Pre-Test 113.9 dBA	Precipitation: Yes (explain) / No — SEE OTHER SHEETS
Windscreen: (Yes) / No (explain)	Post-Test 114.0 dBA	Avg Wind Speed/Direction:
Topo: (Flat / Hilly) ← BERM	GPS Coordinates (at SLM location)#	Temp (°F): RH (%):
Terrain: Hard/Soft/(Mixed)/Snow		Bar Psr (Hg): Cloud Cover (%):

Loc. ID	Start Time (hh:mm)	Stop Time (hh:mm)	Metrics L_{eq}	L_{min}	L_{max}	Statistics L_{10}	L_{50}	L_{90}	Notes/Events

Roadway Name/Dir.		
Speed (post/obs)*		
Number of Lanes		
Width (pave/row)		
1- or 2- way		
Grade		
Bus Stops		
Stoplights		
Motorcycles		
Automobiles		
Medium Trucks		
Heavy Trucks		
Buses		
Count duration		

compass

Site Diagram:

- note coordinate system * - Speed estimated by Radar / Driving / Observation

Photos Taken? Yes/(No)

Additional Notes/Comments:

Noise Sources (circle all that apply): distant aircraft/roadway traffic/rail ops/landscaping/rustling leaves/children playing/dogs barking/birds vocalizing/insects/mechanical

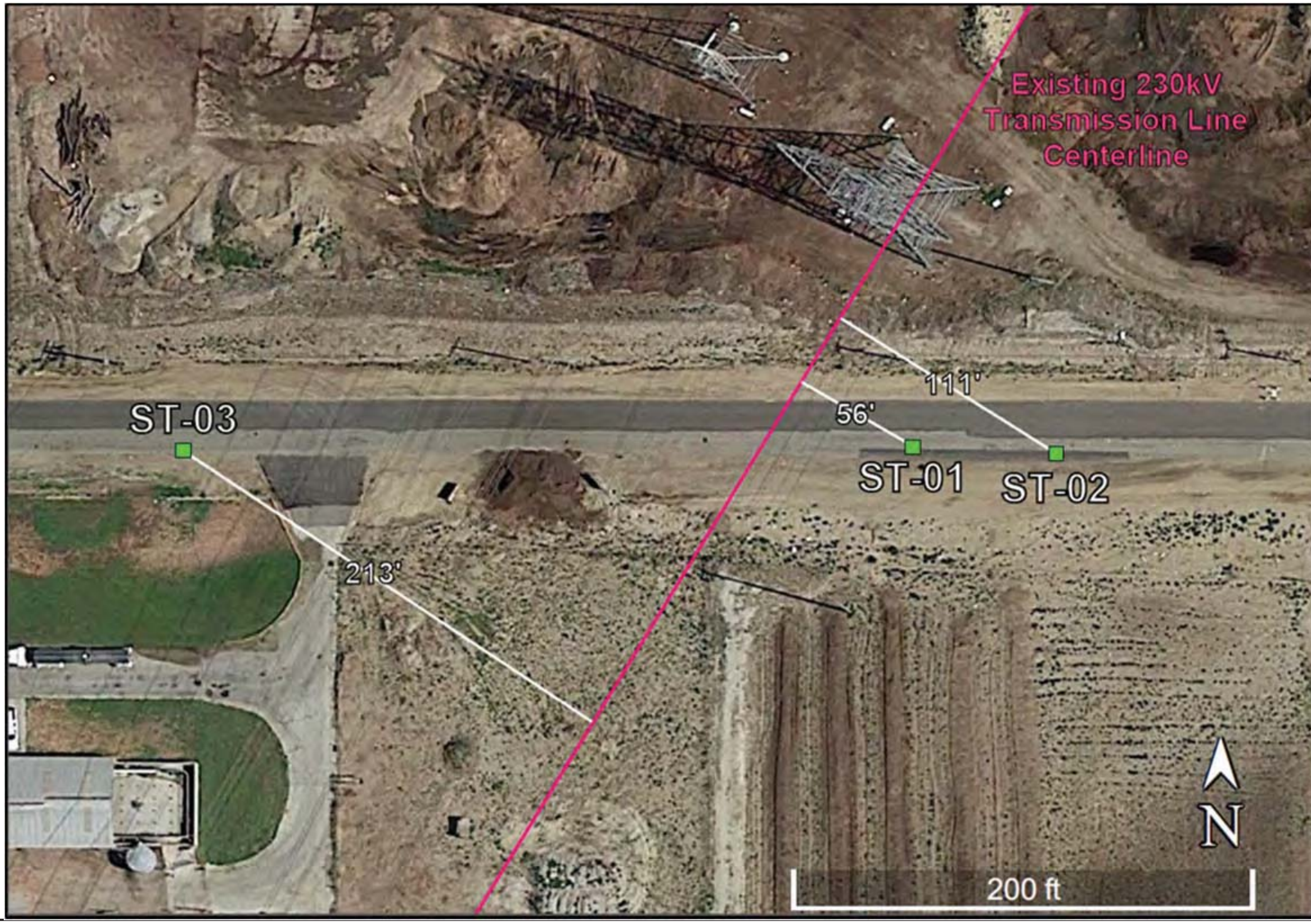
Additional Notes and Sketches on Reverse or Indicated Separate Sheet(s)

Audible Noise (AN)

source: US Dept. of Interior, Bonneville Power Administration, Technical Report No. ERJ-77-167

rainy weather, AC line voltage

term description	term name/symbol	value	units			notes
maximum conductor surface voltage gradient	E	33.9	kVrms/cm			
= 0.589(D)*N$^{(0.482)}$ for N >= 4; = D if N < 4	Deq	8.98				
diameter of subconductor in the bundle	D	8.98	mm	1590	Kcmil	input from EIR project description
number of conductors in bundle	N	2				input from EIR project description
radial distance from bundle center to calculation point	R	29.7	m	16	m	input is horizontal ground distance
audible noise per phase	AN_{phase}	48.7	L50, dBA			
number of phases		3				input from EIR project description
total audible noise	AN_{total}	**53.5**	L50, dBA			
		57.0	L5, dBA			
fair weather		28.5	L50, dBA			
		32.0	L5, dBA			
below to calculate "E" above...						
rated voltage	V	242	kV			input from EIR project description
factor for multiple conductors	β	0.509816				=(1+(n-1)*r/R)/n
radius of conductor	r	0.45	cm			
outside radius of bundle	R	22.86001	cm			=S/(2*sin(3.14/n))
equivalent radius of bundle conductor	Re	9.05952	cm			=Rn*SQRT(nr/R)
distance between conductor centers	S	45.72	cm	18	inches	input from EIR project description
phase spacing	a	1000	cm			estimate
height of conductor above ground	h	2500	cm			estimate
number of component conductors in bundle	n	2				



Appendix Figure
Corona Audible Noise (AN) Survey Measurement Locations at an Existing 230 kV Line