

## 4.11 Noise and Vibration

This section describes the environmental and regulatory setting and discusses impacts associated with the construction and operation of the Santa Barbara County Reliability Project (proposed project) with respect to noise and vibration. The analysis presented in this section focuses on impacts to community sensitive receptors, based on human response to changes in noise and vibration levels. The potential impacts of noise on biological resources are discussed in Section 4.4, "Biological Resources." The work associated with the Getty, Goleta, Ortega, Ventura, and Santa Barbara Substations would occur within existing structures and would not expose sensitive receptors to noise in excess of existing levels; therefore, these components of the proposed project are not discussed further in this section.

### 4.11.1 Environmental Setting

#### 4.11.1.1 Definitions

##### Noise

Noise is commonly defined as an unwanted airborne sound, which occurs as a rapid fluctuation of air pressure above and below the atmospheric pressure. To describe environmental noise at the regional and local levels, and to assess impacts on areas sensitive to community noise, an understanding of noise fundamentals is necessary. There are several ways to measure noise, depending on the source, the receiver (human response to changes in noise and vibration levels), and the reason for measurement. The most common scale for sound levels is the A-weighted scale, which has been adopted by regulatory bodies worldwide. The A-weighted scale approximates the response in a manner that corresponds to how a human perceives sound.<sup>1</sup> Sound levels for environmental noise analyses are commonly reported in A-weighted decibels (dBA).

A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (Leq), which is the logarithmic average noise energy level due to all sources (for example, the ambient noise level in addition to construction and traffic noise) in a given area for a defined period of time (for example, 1 hour or 24 hours). The Leq is commonly used to measure steady-state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by L<sup>xx</sup>, where "xx" represents the percentage of time the sound level is exceeded. For example, L<sub>90</sub> represents the noise level exceeded during 90 percent of the measurement period. Similarly, L<sub>10</sub> represents the noise level exceeded for 10 percent of the measurement period. The relative A-weighted noise levels of common sounds in the environment and industry for various sources are provided in Table 4.11-1.

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<sup>1</sup> Studies have reported that the human annoyance or disturbance related to sound levels correlates with the A-scale (Caltrans 1998).

**Table 4.11-1 Typical Sound Levels Measured in the Environment and Industry**

Noise Source at a Given Distance (feet)	A-Weighted Sound Level (dBA)	Qualitative Description
Carrier deck jet operation Jet takeoff (200 feet)	140 130 120	Pain threshold
Auto horn (3 feet) Jet takeoff (1,000 feet) Shout (0.5 feet)	110 100	Maximum vocal effort
Subway station (50 feet) Heavy truck (50 feet)	90	Very annoying; hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet) Freight train (50 feet) Freeway traffic (50 feet)	80 70 to 80 70	Annoying Intrusive (telephone use difficult)
Air conditioning unit (20 feet) Light auto traffic (50 feet) Living room/Bedroom	60 50 40	Quiet
Library/Soft whisper (5 feet) Broadcasting/Recording studio	30 20 10	Very quiet Just audible

Source: NYSDEC 2001 (Adapted from Table E.)

1 Another metric used to determine the impact of environmental noise is the difference in human  
2 responses to daytime and nighttime noise levels. During the evening and at night, exterior  
3 background noises are generally lower than during the day. However, most household noise also  
4 decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at  
5 night and are therefore more sensitive to intrusive noises. To account for human sensitivity to  
6 evening and nighttime noise levels, the Daytime-Nighttime Noise Level (Ldn) and Community  
7 Noise Equivalent Level (CNEL) metrics were developed. The Ldn accounts for the greater  
8 annoyance of noise during the night (10:00 p.m. to 7:00 a.m.). The CNEL accounts for the greater  
9 annoyance of noise during the evening (7:00 p.m. to 10:00 p.m.) and nighttime hours.

10

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

12

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

16

17 In most cases, environmental noise may produce effects in the first two categories only. No  
18 completely satisfactory way exists to measure the subjective effects of noise or to measure the  
19 corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is  
20 primarily due to the wide variation in individual thresholds of annoyance and habituation to noise.  
21 Thus, an important way of determining a person's subjective reaction to a new noise is to compare  
22 it to the existing or "ambient" environment to which that person has adapted. In general, the more  
23 the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise  
24 level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

25

1 The general human response to changes in noise levels that are similar in frequency content (for  
2 example, comparing increases in continuous [Leq] traffic noise levels) is summarized as follows:

- 3
- 4 • A 3-dBA change in sound level is a barely noticeable difference.
- 5 • A 5-dBA change in sound level is typically noticeable.
- 6 • A 10-dBA change is perceived by the listener as a doubling in loudness.
- 7

8 Noise levels naturally attenuate (i.e., diminishes in loudness) as a function of the distance between  
9 the source and receptor. Through the air, sound reduces with distance due to (1) divergence, (2)  
10 absorption/diffusion, and/or (3) shielding (FTA 2006). For sources of noise emanating from a  
11 single location or grouped closely together (i.e., point sources), noise attenuates at a rate of  
12 approximately 6 dBA for each doubling of distance from the source, assuming no presence of  
13 physical barriers, vegetation, and/or changes in topography along the path to the receiver.

#### 14 **Vibration**

15  
16 Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or  
17 acceleration. Vibratory motion is commonly described by identifying peak particle velocity, which  
18 is generally accepted as the most appropriate descriptor for evaluating building damage. However,  
19 human response to vibration is usually assessed using amplitude indicators (root-mean square) or  
20 vibration velocity levels measured in inches per second or in vibration decibels (VdB). According to  
21 the Federal Transit Administration (FTA), the background velocity level in residential areas is  
22 usually 50 VdB (FTA 2006). Although the perceptibility threshold is about 65 VdB, human response  
23 to vibration is not usually significant unless the vibration exceeds 70 VdB.

24  
25 One of the major problems in developing suitable criteria for groundborne vibration is that there  
26 has been relatively little research into human response to vibration or, in particular, into human  
27 annoyance with building vibration. General assessment thresholds cited by the FTA conclude  
28 vibration levels between 72 to 80 VdB per day are acceptable for residential uses (FTA 2006).

29  
30 Attenuation of the vibration intensity depends on several factors, such as the source (e.g. vehicle  
31 suspension, roadway surface, speed, depth of the source), the vibration path (e.g., soil type and  
32 layering, presence of rock layers, and depth of water table), the characteristics of the receiver  
33 (foundation type, building construction, and acoustical absorption), and presence of other natural  
34 or man-made barriers.

#### 35 36 **4.11.1.2 Regional and Local Setting**

37  
38 The proposed project components would be located in Santa Barbara County and Ventura County.  
39 Most of the construction activities along the proposed 66-kilovolt (kV) subtransmission line  
40 segments, and telecommunication system installation at substations, would occur in  
41 unincorporated areas of both counties, except for those components located in the City of  
42 Carpinteria's jurisdiction. Primary land use categories within the proposed project area include  
43 rural, open space/recreation, urban, low residential, and public facility. Existing noise sources  
44 identified in these areas include traffic along local roadways, aircraft overflights, and operation of  
45 agricultural equipment. Main roadways in the proposed project area include North Ventura  
46 Avenue/State Route (SR) 33, Casitas Pass Road, and multiple arterial local routes. The closest  
47 airports to the proposed project components are the Santa Barbara Airport (18 miles from the

1 Carpinteria Substation), Oxnard Airport (7 miles from the Santa Clara Substation), and Camarillo  
2 Airport (8 miles from the Santa Clara Substation).  
3

4 **Sensitive Receptors**

5 The noise and vibration environment within the proposed project area is also characterized by the  
6 presence of noise- and vibration-sensitive land uses. These sensitive land uses are generally  
7 defined as locations where the presence of unwanted sound or vibration could adversely affect the  
8 designated land uses. Typically, sensitive receptors on noise-sensitive lands include residences,  
9 hospitals, places of worship, libraries and schools, nature and wildlife preserves, and parks. Table  
10 4.11-2 presents the noise-sensitive receptors identified per project component, within a 1-mile  
11 radius. The predominant types of receptors in the area are single-family residences, a school, and  
12 recreational users of the Los Padres National Forest (SR 33 Corridor).  
13

**Table 4.11-2 Sensitive Receptors within a 1-mile Radius of the Proposed Project**

Project Component	Jurisdiction	Sensitive Receptor	Distance and Direction from Project Component
<b>66-kV Subtransmission Line / Telecommunications Route</b>			
Segment 1	Ventura County	Ventura Missionary Christian	0.84 mile, SW
		Ventura Missionary Church	0.85 mile, SW
		Foster Park	0.69 mile, SW
Segment 2	Ventura County	First Baptist Church	0.39 mile, NE
Segment 3A	City of Carpinteria	Carpinteria Middle School	0.84 mile, S
		Main Elementary School	0.87 mile, S
		Aliso Elementary School	0.83 mile, SW
		Carpinteria Family School	0.26 mile, S
		Canalino Elementary School	0.26 mile, S
		Howard School	0.04 mile, S
		First Church of Christ Scientist	0.78 mile, S
		Carpinteria Community Church	0.67 mile, S
		Carpinteria Valley Baptist Church	0.69 mile, S
		Church of Christ	0.68 mile, S
		The Carpenters Chapel	0.67 mile, S
		Faith Lutheran Church	0.36 mile, S
		Saint Joseph Catholic Church	0.19 mile, S
		First Baptist Church of Carpinteria	0.03 mile, N
		Rincon Beach Park	1.00 mile, S
		Heath Ranch Park	0.46 mile, SW
		Memorial Park	0.62 mile, SW
		Franklin Park	0.22 mile, S
		El Carro Park	0.01 mile, S
	Carpinteria State Beach	0.98 mile, S	
Carpinteria Salt Marsh Reserve	0.91 mile, SW		
Salt Marsh Nature Reserve	0.96 mile, SW		
Segment 3A	Santa Barbara County	Monte Vista Park	0.60 mile, S
		Lions Park	Crossed by project
		Cate School	0.46 mile, N
Segment 3B	Ventura County	Los Padres National Forest	0.78 miles, N

**Table 4.11-2 Sensitive Receptors within a 1-mile Radius of the Proposed Project**

Project Component	Jurisdiction	Sensitive Receptor	Distance and Direction from Project Component
Segment 4	Santa Barbara County	Los Padres National Forest	Crossed by project (0.25 mile)
	City of Carpinteria	Carpinteria High School	0.09 mile, W
		Foothill High School	0.14 mile, W
		Rincon High School	0.15 mile, W
		Church of Nazarene	0.89 mile, SW
<b>Substations</b>			
Santa Clara	Ventura County	Residences (east of City of Buenaventura)	0.74 miles, SW 0.48 miles, SE
Casitas	Ventura County	Residences surrounding the substation	Closest residences: 0.03 mile, N 0.03 mile E
Carpinteria	City of Carpinteria	Carpinteria High School	0.07 mile, W
		Residences surrounding the substation	Closest Residence: 0.07 mile, S

Source: E & E 2013; SCE 2012

**1 Existing Ambient Noise Levels**

2 In February 2012, the applicant conducted monitoring of the ambient noise conditions within the  
3 vicinity of the proposed project components. Table 4.11-3 summarizes the ambient noise levels  
4 reported at each of the monitoring locations. Figure 4.11-1 presents monitoring locations and  
5 receptors identified in the vicinity of the proposed project components. The applicant conducted  
6 24-hour sound level measurements at the five closest receptors in the vicinity of Segments 3B and  
7 4, and at each substation property line. Ambient hourly noise levels measured by the applicant at  
8 the Carpinteria Substation ranged from 41 to 57 dBA Leq; from 48 to 62 dBA Leq at Casitas  
9 Substation; and from 42 to 58 dBA Leq at the Santa Clara Substation. Calculated CNEL at each  
10 substation location is provided in Table 4.11-3.  
11

**Table 4.11-3 Ambient Noise Levels reported by the applicant at closest receptors**

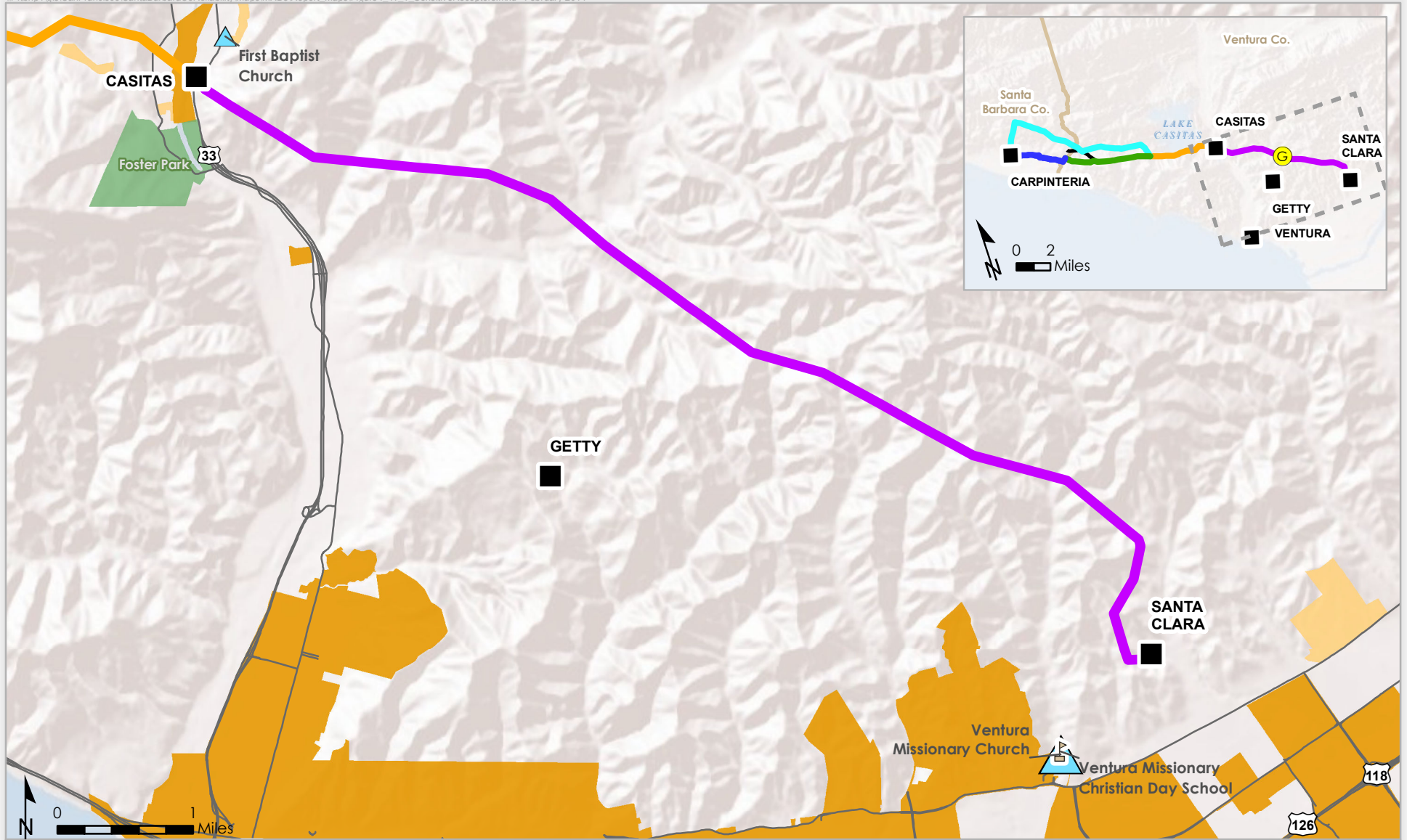
Project Component	Measurement location	Measured Noise Level
<b>66-kV Subtransmission Line / Telecommunication Route</b>		<b>dBA, Leq</b>
Segment 3B	East of SR-150/SR-192 junction	54
	South of SR-150/Mission Ridge Road junction	51
	South of SR-150/Mission Ridge Road junction	38
Segment 4	Above Gobernador Canyon Road, Santa Barbara County	50
	East of Stanley Park Road, Santa Barbara County	52
<b>Substations</b>		<b>CNEL</b>
Santa Clara	Southwestern property line	55
Casitas	Northern property line	64
Carpinteria	Northwestern property line	53

Source: ARCADIS 2012.

Note: The applicant conducted 24-hour sound level measurements at the five closest receptors in the vicinity of the proposed pole and conductor removal/replacement sites (Segments 3B and 4) and at nearest receptors at each of the substation property lines. At each location, the applicant ran measurements from midnight to midnight with data logging each 30 minutes.

Key:

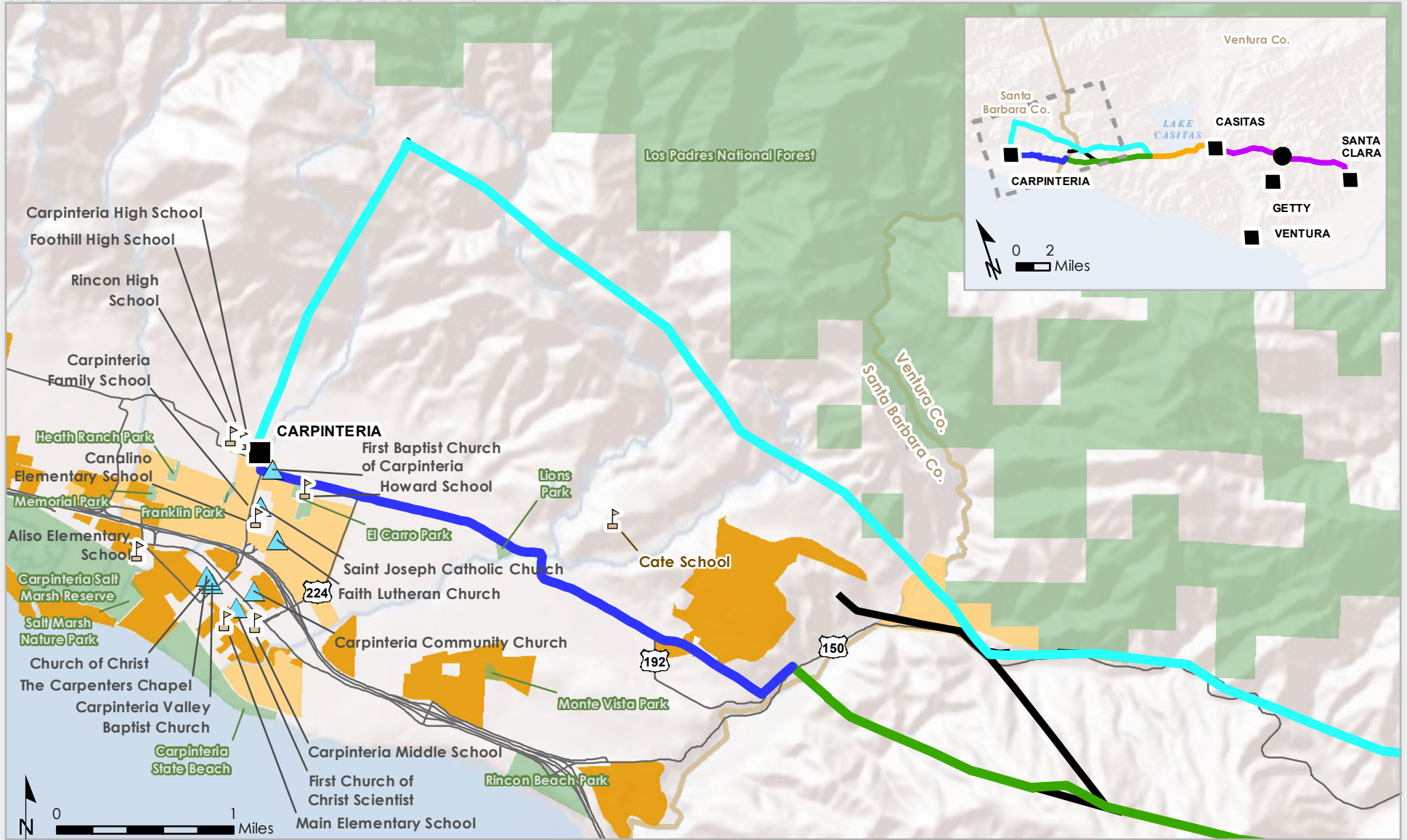
- CNEL Community Noise Equivalent Level
- dBA A-weighted decibel
- Leq Equivalent sound pressure level
- SR State Route



- |   |                               |                      |
|---|-------------------------------|----------------------|
| Existing Electrical Subtransmission Lines | Existing Substation Locations | Church               |
| Segment 1                                 | Getty Tap                     | School               |
| Segment 2                                 | Major Roads                   | Park                 |
| Segment 3A                                | Local road                    | Residential (Low)    |
| Segment 3B                                | County Boundary               | Residential (Medium) |
| Segment 4                                 |                               |                      |
| Segment 5                                 |                               |                      |

**Figure 4.11-1a**  
**Sensitive Receptors within**  
**a 1-mile Radius of the**  
**Proposed Project**

Santa Barbara County  
 Reliability Project  
 Santa Barbara and  
 Ventura Counties California



- |   |                               |                      |
|---|-------------------------------|----------------------|
| Existing Electrical Subtransmission Lines | Existing Substation Locations | Church               |
| Segment 1                                 | Getty Tap                     | School               |
| Segment 2                                 | Major Roads                   | Park                 |
| Segment 3A                                | Local road                    | Residential (Low)    |
| Segment 3B                                | County Boundary               | Residential (Medium) |
| Segment 4                                 |                               |                      |
| Segment 5                                 |                               |                      |

**Figure 4.11-1b**  
**Sensitive Receptors within a 1-mile Radius of the Proposed Project**  
 Santa Barbara County Reliability Project  
 Santa Barbara and Ventura Counties California

1 **4.11.2 Regulatory Setting**  
2

3 This subsection summarizes federal, state, and local laws, regulations, and standards that govern  
4 noise in the project area.  
5

6 **4.11.2.1 Federal**  
7

8 No federal noise standards directly regulate environmental or community noise. Regulating noise  
9 is generally a responsibility of local governments. However, several federal agencies have  
10 developed community noise guidelines.  
11

12 The U.S. Environmental Protection Agency has published guidelines on recommended maximum  
13 noise levels to protect public health and welfare with adequate margins of safety. A noise level of  
14 70 dBA Leq over a 24-hour period [Leq (24)] was identified as the level of environmental noise that  
15 could lead to hearing loss over a 40-year period (EPA 1978). In addition, noise levels of 55 dBA Ldn  
16 outdoors and 45 dBA indoors were identified as noise thresholds that would prevent activity  
17 interference or annoyance (FTA 2006). Workers' exposure to noise is regulated by the federal  
18 occupational noise regulations established by the Occupational Safety and Health Administration in  
19 29 Code of Federal Regulations (CFR) 1910.95. Table 4.11-4 shows the federal guidelines and  
20 regulations for exterior noise.  
21

**Table 4.11-4 Federal Guidelines and Regulations for Exterior Noise (dBA)**

Agency	Leq	Ldn
Federal Energy Regulatory Commission	[49]	55
Federal Highway Administration	67	[67]
Federal Aviation Administration	[59]	65
U.S. Department of Transportation – Federal Rail and Transit Authorities <sup>a,b</sup>	Sliding scale <sup>e</sup>	Sliding scale <sup>e</sup>
U.S. Environmental Protection Agency <sup>c</sup>	[49]	55
U.S. Department of Housing and Urban Development <sup>d</sup>	[59]	65

Sources:

- a FRA 2005 (Updated to latest revision 2005)
- b FTA 2006
- c EPA 1978
- d CFR Title 24 Part 51B (U.S. Department of Housing and Urban Development 1991)
- e Refer to Figure 3.10-2 of FRA 2005

Note: Brackets around numbers (e.g., [59]) indicate calculated equivalent standard for a steady noise source. Because the Federal Highway Administration regulates peak noise level, the Ldn is assumed equivalent to the peak noise hour.

Key:

- DBA A-weighted decibels
- Ldn Daytime-Nighttime Noise Level
- Leq equivalent sound pressure level

22 In regard to groundborne vibration and groundborne noise, agencies such as the FTA and the U.S.  
23 Bureau of Mines have extensively studied the effects of ground vibration and damage on structures.  
24 The FTA has established construction vibration damage criteria of 0.12 inches per second or 90  
25 VdB for buildings extremely susceptible to vibration damage.  
26  
27



1 **U.S. Forest Service**

2 A 0.25-mile portion of the proposed 66-kV subtransmission line Segment 4 would be located  
3 within the Los Padres National Forest, involving the potential use of helicopters for installing the  
4 majority of the proposed structures. The U.S. Forest Service (USFS) directive FSH 1909.12 (Land  
5 Management Planning Handbook) identifies noise as key criteria for the definition of wilderness  
6 areas; however, no specific standards applicable to USFS land uses are provided within this  
7 regulation. Notwithstanding, the USFS has published a study addressing the potential effects of  
8 aircraft overflights over National Forest wilderness areas (USDA 1992). Based on the conclusions  
9 from this study, the USFS discourages flight operations over wilderness areas below 2,000 feet  
10 above ground level (AGL). This restriction is consistent with the Federal Aviation Administration  
11 (FAA) policy for noise on federally managed areas and FAA's Advisory Circular AC No: 91-36D.

12  
13 The Los Padres National Forest Land Use Management Plan emphasizes land use objectives that  
14 are expected to result in the sustainability of the national forest and its healthy maintenance over  
15 the long term. Although the objectives, goals, and policies described in this plan do not include  
16 noise standards, major conclusions from the Land Management Plan Final Environmental Impact  
17 Statement (FEIS) acknowledges the need to evaluate increased noise levels in or in the proximity to  
18 wilderness areas. In particular, the FEIS recognizes that areas where construction and  
19 reconstruction of roads near wilderness boundaries could occur, short-term increases in noise  
20 levels and would affect recreational users on a temporary basis (USDA 2005).

21  
22 **Federal Aviation Administration Noise Recommendations**

23 Since the proposed project would involve helicopter use over federal lands (Los Padres National  
24 Forest), the following FAA guidelines would be applicable.

25  
26 ***Noise Policy for Management of Airspace over Federally Managed Areas (February 9, 2012)***

27 It is the policy of the FAA in its management of the navigable airspace over federal lands to exercise  
28 leadership in achieving an appropriate balance between efficiency, technological practicability, and  
29 environmental concerns, while maintaining the highest level of safety. This policy promotes joint  
30 efforts between the FAA and the federal agencies managing noise-sensitive areas (e.g., USFS) to  
31 enhance the compatibility between management of the airspace and the management goals of  
32 these agencies.

33  
34 ***Advisory Circular AC No: 91-36D***

35 The FAA recommends that avoidance of noise-sensitive areas, if practical, is preferable to  
36 overflight at relatively low altitudes. Pilots operating noise-producing aircraft over noise-sensitive  
37 areas should make every effort to fly not less than 2,000 feet AGL, weather permitting. For the  
38 purpose of this Advisory Circular, the ground level of noise-sensitive areas is defined to include the  
39 highest terrain within 2,000 feet AGL laterally of the route of flight, or the uppermost rim of a  
40 canyon or valley. The intent of the 2,000-foot AGL recommendation is to reduce potential  
41 interference with wildlife and complaints of noise disturbances caused by low-flying aircraft over  
42 noise-sensitive areas.

1 **4.11.2.2 State**

2  
3 No statewide regulations address noise impacts; however, the State of California requires local  
4 governments to perform noise surveys and implement a noise element as part of its General Plan  
5 (OPR 2003), as established in the California Government Code Section 65302(f). In addition, the  
6 State recommends interior and exterior noise standards by land use category and standards for the  
7 compatibility of various land uses and noise levels. Four type of land uses are defined as  
8 incompatible with noise above 65 CNEL: residences, schools, hospitals and convalescent homes,  
9 and places of worship. These state-level standards are commonly applicable for permanent noise  
10 sources and constitute the basis for local government noise elements.

11  
12 **4.11.2.3 Regional and Local**

13  
14 The proposed project would be located in multiple counties and municipalities, specifically within  
15 Santa Barbara County, the City of Carpinteria, and Ventura County. All jurisdictions regulate  
16 environmental noise sources through policies and/or ordinances. These regulations are described  
17 as follows.

18  
19 **Santa Barbara County**

20 ***Santa Barbara County Comprehensive General Plan – Noise Element***

21 The Santa Barbara County General Plan Noise Element develops a statement of public policy to  
22 address excessive noise. It identifies major sources of noise within the county and potential  
23 methods of attenuation or abatement. Significant noise impact problems in Santa Barbara County  
24 are primarily associated with transportation facilities; therefore, applicable noise reduction  
25 measures for the proposed project involve reducing motor vehicle noise and noise from  
26 commercial and industrial sources. Recommended vehicle noise reduction measures include  
27 establishing truck routes, reducing vehicle speed, and regulating traffic flow. Additionally,  
28 recommendations for reducing noise from commercial and industrial sources include using  
29 enclosures for machinery placed outdoors, as well as using structures and solid walls around the  
30 perimeter of a source as noise barriers. The Noise Element also provides directions for the  
31 countywide noise ordinance and functions of the noise control officer (County of Santa Barbara  
32 2009).

1 **Santa Barbara County Code of Ordinances – Grading Code**

2 The Santa Barbara County Code of Ordinances Section 14-22 limits grading work to between 7:00 A.M.  
3 and 7:00 P.M. Grading work may be completed during other times under written authorization if the  
4 work is not likely to cause significant public nuisance or if it must be accomplished during other times.

6 **Santa Barbara County Environmental Thresholds and Guidelines Manual**

7 This manual establishes thresholds of significance for assisting in the determination of significant  
8 noise impacts. For projects proposed within the County’s jurisdiction, the following criteria are  
9 defined (County of Santa Barbara 2008):

- 10
- 11 *a. A proposed development that would generate noise levels in excess of 65 dBA CNEL and*  
12 *could affect sensitive receptors would generally be presumed to have a significant impact.*
- 13 *b. Outdoor living areas of noise-sensitive uses that are subject to noise levels in excess of 65*  
14 *dBa CNEL would generally be presumed to be significantly impacted by ambient noise. A*  
15 *significant impact would also generally occur where interior noise levels cannot be reduced to*  
16 *45 dBA CNEL or less.*
- 17 *c. A project will generally have a significant effect on the environment if it will increase*  
18 *substantially the ambient noise levels for noise-sensitive receptors adjoining areas. Per item a.,*  
19 *this may generally be presumed when ambient noise levels affecting sensitive receptors are*  
20 *increased to 65 dBA CNEL or more. However, a significant effect may also occur when ambient*  
21 *noise levels affecting sensitive receptors increase substantially but remain less than 65 dBA*  
22 *CNEL, as determined on a case-by-case level.*
- 23 *d. Noise from grading and construction activity proposed within 1,600 feet (0.3 miles) of*  
24 *sensitive receptors, including schools, residential development, commercial lodging facilities,*  
25 *hospitals or care facilities, would generally result in a potentially significant impact. To*  
26 *mitigate this impact, construction within 1,600 feet of sensitive receptors shall be limited to*  
27 *weekdays between the hours of 8 a.m. to 5 p.m. only. Noise attenuation barriers and muffling*  
28 *of grading equipment may also be required.*

30 **Ventura County**

31 ***Ventura County General Plan***

32 The goal of the Ventura County General Plan Noise Element is to protect the health, safety, and  
33 general welfare of Ventura County residents by eliminating or avoiding adverse noise impacts on  
34 existing and future noise-sensitive uses (County of Ventura 2011). To accomplish this goal, the  
35 General Plan establishes a set of community noise abatement policies such as noise compatibility  
36 criteria with surrounding for all discretionary developments involving noise exposure or  
37 generation in excess of established standards. For controlling sources proposed to be located near  
38 any noise-sensitive use, this policy establishes the following maximum allowable 1-hour average  
39 noise levels (Leq):

- 40
- 41 • 55 dBA (or ambient noise level plus 3 dBA, whichever is greater) from 6 a.m. to 7 p.m. on  
42 weekdays;
  - 43 • 50 dBA (or ambient noise level plus 3 dBA, whichever is greater) from 7 p.m. to 10 p.m.;
  - 44 and

- 45 dBA (or ambient noise level plus 3 dBA, whichever is greater) from 10 p.m. to 6 a.m.

Noise control measures required in the Noise Element need to address the following priorities:

- Reduction of noise emissions at the source;
- Attenuation of sound transmission along its path, using barriers, landforms modification, dense plantings, and the like; and
- Rejection of noise at the reception point via noise control building construction, hearing protection or other means.

**Ventura County Ordinance No. 4124**

Chapter 2, Division 6 of the Ventura County Ordinance Code restricts loud noise at residential receptors from 9 p.m. to 7 a.m. of the following day, from any source located at a distance of 50 feet from the receptor property line.

**Ventura County Construction Noise Threshold Criteria and Control Plan**

To address specific construction noise limits for noise-sensitive locations not currently addressed in the Ventura County General Plan or Ordinance Code, Ventura County has developed noise thresholds and standard noise monitoring and control measures for construction activities within the County’s jurisdiction (County of Ventura 2010). These thresholds are summarized in Tables 4.11-5 and 4.11-6.

**Table 4.11-5 Ventura County Daytime Construction Noise Threshold Criteria**

Construction Duration Affecting Noise-sensitive Receptors	Noise Threshold Criteria <sup>1</sup>	
	Fixed Leq(h), dBA	Hourly Equivalent Noise Level (Leq), dBA <sup>2,3</sup>
0 to 3 days	75	Ambient Leq (h) + 3dB
4 to 7 days	70	Ambient Leq (h) + 3dB
1 to 2 weeks	65	Ambient Leq (h) + 3dB
2 to 8 weeks	60	Ambient Leq (h) + 3dB
Longer than 8 weeks	55	Ambient Leq (h) + 3dB

Source: County of Ventura 2010

Notes:

(1) Daytime noise threshold criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building.

(2) The instantaneous maximum sound level shall not exceed the threshold by 20 dBA more than 8 times per daytime hour.

(3) Local ambient Leq measurements are required by Ventura County to be made on any mid-week day prior to project work.

Key:

- dB      decibels
- dBA     A-weighted decibels
- Leq     equivalent sound pressure level
- Leq(h)  hourly equivalent sound level

**Table 4.11-6 Evening and Night Construction Noise Threshold Criteria**

Receptor Location	Noise Threshold Criteria <sup>1</sup>	
	Fixed Leq(h), dBA	Hourly Equivalent Noise Level (Leq), dBA <sup>2,3</sup>
Residential	50 (evening)	Ambient Leq(h) + 3 dB
Resident, Live-in Institutional	45 (night)	Ambient Leq(h) + 3 dB

Source: Ventura County 2010

Notes:

- 1 Evening and night noise threshold criteria shall be the greater of these noise levels at the nearest receptor area or 10 feet from the nearest noise-sensitive building.
- 2 The instantaneous maximum sound level shall not exceed the threshold by 20 dBA more than 8 times per daytime hour.
- 3 Local ambient Leq measurements are required by Ventura County to be made on a typical mid-week day evening and night prior to project work.

Key:

- dB        decibels
- dBA      A-weighted decibels
- Leq       equivalent sound pressure level
- Leq(h)   hourly equivalent sound level

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~~**Santa Barbara County Municipal Code**~~

~~Title 9 (Public Peace and Safety), Chapter 9.16 of the Santa Barbara Municipal Code sets the regulation for noise control. In particular, Section 9.16.015 restricts construction work during nighttime hours between 8 p.m. of any day and 7 a.m. of the following day to erect, construct, demolish, excavate for, alter, or repair any building or structure if the noise level generated exceeds the ambient noise level by 5 dBA at the nearest property line used for residential purposes, unless a special permit has been granted by the Chief of Building and Zoning. Before granting this special permit, the County considers potential impacts of construction noise in the vicinity of the proposed work site, existing land uses, and whether night work is in the general public interest.~~

~~Additionally, Section 9.16.025 regulates noise affecting parcels zoned or used for residential purposes. Hours of operation for the use of mechanical equipment other than vehicles and other proposed project activities such as grading, vegetation removal, and restoration would be limited to 7 a.m. to 7 p.m. Monday through Saturday, and from 8 a.m. to 7 p.m. on Sundays and holidays. Moreover, this regulation requires insulation for all mechanical equipment other than vehicles operating at the property line of any adjacent parcel used or zoned for residential, institutional or park purposes to avoid exceeding a noise level limit of 60 dBA CNEL.~~

**City of Carpinteria**

**Resolution No. 408**

This resolution adopts updated and revised environmental review regulations pursuant to the California Environmental Quality Act (CEQA) and the City of Carpinteria Municipal Code, Chapter 8.48. Under this regulation, noise impacts from projects within the City’s jurisdiction are evaluated by using quantitative thresholds. Thresholds are based on guidelines provided in the Noise Element of the General Plan. Two sources of sound impacts are evaluated: short-term construction noise and long-term noise associated with the proposed project activities. Project-related noise impacts are significant if they raise existing noise levels to above the applicable criterion or if noise resulting from the project increases average ambient levels that are already above the applicable criterion by more than three dBA, or if project-generated noise results in a 5-dBA increase and the resulting level remains below the maximum considered normally acceptable.

1  
2 Thresholds for both short-term and long-term noise sources established by the City are as follows:  
3

4 Temporary Construction Noise

- 5 • Temporary construction noise which exceeds 75 dBA CNEL for 12 hours within a 24-hour  
6 period at residences would be considered significant. Additionally, where temporary  
7 construction noise would substantially interfere with normal business communication, or  
8 affect sensitive receptors, such as day care facilities, hospitals or schools, temporary  
9 impacts would be considered significant.
- 10 • An increase in noise would be considered significant if any of the following conditions  
11 occurred for an extended period of time:
- 12 – An increase in noise levels of 10 dBA if the existing noise levels are below 55 dBA  
13 (creates a potential significant nuisance effect);
- 14 – An increase in noise levels that exceeds noise level standards if the existing noise levels  
15 are between 55 and 60 dBA (violates existing regulatory requirement); or
- 16 – An increase in noise levels of 5 dBA if the existing noise levels are above 60 dBA  
17 (violates or worsens a violation of an existing regulatory requirement).
- 18 • For vehicular traffic, the City of Carpinteria has set a noise level of 65 Leq<sup>2</sup>.  
19

20 Permanent Noise Sources

- 21 • A proposed development that would generate noise levels in excess of 65 dB CNEL and  
22 could affect sensitive receptors would be considered to have a significant impact.
- 23 • Outdoor living areas of noise sensitive uses that are subject to noise levels in excess of 65  
24 dB CNEL would be considered to be significantly impacted by ambient noise. A significant  
25 impact would also occur interior noise levels cannot be reduced to 45 dB CNEL or less.
- 26 • A project will have a significant effect on the environment if it will increase substantially  
27 the ambient noise levels for adjoining areas.  
28

29 Noise from Adjacent Stationary Uses (Noise Generators)

- 30 • A project which would generate noise levels at the property line which exceed the City's  
31 Noise Ordinance Standards is considered potentially significant.
- 32 • If a non-residential use, such as a commercial, industrial or school use, is proposed to abut  
33 an existing residential use, the noise level of the non-residential use should not exceed the  
34 residential standards of 64 dBA CNEL at the adjoining property line.
- 35 • Although the noise level could be consistent with the City's Noise Ordinance Standards, a  
36 noise level above 65 dBA CNEL at the residential property line could be considered a  
37 significant environmental impact.  
38

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<sup>2</sup> The Ldn and Leq measures are expressed on the dBA sound level scale. For purposes of comparing noise level indices, the City of Carpinteria has established that Leq (for the peak-traffic period) is approximately equivalent to the Ldn.

1 **Other Plans and Regulations**

2 ***Ojai Valley Planning Area***

3 The proposed 66-kV subtransmission line Segments 2, 3B, and 4 would traverse a portion of the  
4 Ojai Valley Planning Area, located south of Lake Casitas. The Ojai Valley Area Plan establishes goals  
5 and policies for public services in the area, especially for transportation and circulation. However,  
6 no specific noise level standards associated with vehicular traffic or construction noise are  
7 provided in this plan (County of Ventura 2005).

8  
9 **4.11.3 Impact Analysis**

10  
11 **4.11.3.1 Methodology and Significance Criteria**

12  
13 The evaluation of noise and vibration impacts from the proposed project involved a review of  
14 relevant city and county noise standards; an assessment of the existing noise environment in the  
15 project area; and a projection of noise levels from equipment, vehicles, and activities. County and  
16 project maps and satellite images were reviewed to determine the proximity of the proposed  
17 project to the closest sensitive receptors and airports. In addition, land use plans and topographic  
18 and noise contours maps were researched for relevant information about the existing noise and  
19 vibration levels. Based on the distance from each of the proposed project components to the  
20 identified sensitive receptors and the composite noise levels modeled by the applicant, predicted  
21 noise levels—as perceived by closest receptors—were estimated and compared with applicable  
22 regulatory standards and guidelines.

23  
24 The significance criteria were defined based on the checklist items in Appendix G of the CEQA  
25 Guidelines. The proposed project would cause a significant impact on noise levels if it would:

- 26
- 27 • Expose persons to, or generate, noise levels in excess of standards established in the local  
28 general plan or noise ordinance, or applicable standards of other agencies;
  - 29 • Expose persons to, or generate, excessive groundborne vibration or groundborne noise  
30 levels;
  - 31 • Cause a substantial permanent increase in ambient noise levels in the project vicinity above  
32 levels that would exist without the project;
  - 33 • Cause a substantial temporary increase in ambient noise levels in the project vicinity above  
34 levels that would exist without the project;
  - 35 • Expose people residing near or working on the project to excessive noise levels, for a  
36 project located within an airport land use plan or, where such a plan has not been adopted,  
37 within two miles of a public airport or public use airport; or
  - 38 • Expose people residing near or working on the project to excessive noise levels, for a  
39 project within the vicinity of a private airstrip.
- 40

41 The proposed project components would be located over 7 miles away from existing public  
42 airports, public use airports, and private airstrips currently operating in Santa Barbara County and  
43 Ventura County. Therefore, impacts related to the last two significance criteria listed above are not  
44 applicable.

45

1 The vibration impact analysis used the FTA quantitative annoyance assessment method to  
2 determine the vibration level at closest sensitive receptors identified in Table 4.11-2. This method  
3 estimates the vibration level ( $L_v$ , in VdB) at any distance  $D$  (in feet) from the following equation:  
4

$$L_v(D) = L_v(25ft) - 30\log\left(\frac{D}{25}\right)$$

#### 5 6 7 **4.11.3.2 Applicant Proposed Measures**

8  
9 The applicant has committed to the following applicant proposed measures (APMs) as part of the  
10 design of the proposed project:  
11

- 12 • **APM NV-1:** Construction activities will be conducted or phased to ensure that noise  
13 generated during construction would not exceed thresholds or durations identified by the  
14 City of Carpinteria Resolution No. 408; the County of Ventura noise regulations set forth in  
15 the County's Construction Noise Criteria and Control Plan; or the County of Santa Barbara  
16 Environmental Thresholds and Guidelines Manual.
- 17 • **APM NV-2:** Equipment and trucks used for the proposed project shall employ the best  
18 available noise control techniques to the extent feasible.
- 19 • **APM NV-3:** Stationary sources shall be located as far from adjacent noise-sensitive  
20 receptors as reasonably possible and shall be enclosed if feasible.
- 21 • **APM NV-4:** Where feasible, temporary portable sound barriers would be deployed where  
22 construction noise would cause noise levels at sensitive receptor locations to be in excess  
23 of an applicable criteria threshold. For purposes of this APM, schools would only be  
24 considered sensitive receptor locations during instruction hours.
- 25 • **APM NV-5:** At least two weeks prior to the anticipated start of construction at a particular  
26 location, the applicant will notify all property owners within 300 feet of that location that  
27 construction activities are about to commence at that location.  
28

#### 29 **4.11.3.3 Environmental Impacts**

##### 30 31 **Impact NS-1: Noise levels in excess of standards established in the local general plan or 32 noise ordinance.**

33 LESS THAN SIGNIFICANT WITH MITIGATION  
34

35 The applicant would conduct construction activities during weekday daytime hours from 7 a.m. to  
36 7 p.m. in Ventura County and from 8 a.m. to 5 p.m. in Santa Barbara County. The proposed project  
37 would be constructed over a 24-month period, likely in concurrent phases, and would occur no  
38 more than three consecutive days at each site. Construction equipment operation, use of heavy-  
39 duty vehicles, road work, foundation removal, and helicopter use for the installation of the  
40 proposed 66-kV subtransmission lines would be the primary sources of noise associated with  
41 construction activities for the proposed project components.  
42

43 Noise levels resulting from construction equipment are dependent on several factors, including the  
44 number and type of equipment operating, the level of operation, and the distance between  
45 equipment and receptors. Heavy construction equipment typically generates noise levels up to  
46 approximately 98 dBA at 50 feet. In addition, noise from trucks, commuter vehicles, and other on-



1 road equipment, which would mainly be along streets and access roads, would produce peak levels  
2 of approximately 88 dBA at 50 feet from the source (FTA 2006). Typical maximum noise levels  
3 from construction equipment that would be used for the proposed project is shown in Table 4.11-7.  
4

**Table 4.11-7 Equipment Types and Typical Noise Emission Levels**

Equipment	Typical Noise Level (dBA) 50 feet from source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Loader	85
Manlift	85
Auger	98
Roller	74
Truck	88

Source: FHWA 2006

5  
6 The loudest equipment during construction would contribute to a composite average or equivalent  
7 site noise level. Based on the full list of equipment and expected usage, the applicant conducted a  
8 noise modeling study to estimate composite noise levels from proposed construction activities at  
9 different contour distances and at noise-sensitive receptors located near substations. Tables 4.11-8  
10 and 4.11-9 summarize the results from this study for the 66-kV subtransmission line and proposed  
11 work at substations, respectively. Specifically, Table 4.11-8 indicates that receptors located  
12 between ~~132-183~~ to ~~183-204~~ within approximately 200 feet from construction activities along the  
13 proposed 66-kV subtransmission lines would perceive noise levels that meet or exceed 75 dBA Leq.  
14

**Table 4.11-8 Estimated Noise Contour Distances for 66-kV Subtransmission Line Construction Activities**

Construction Activity	Contour Distance (feet)				
	75 dBA Leq	70 dBA Leq	65 dBA Leq	60 dBA Leq	55 dBA Leq
Conductor removal	183	327	572	975	1,610
Pole Removal	171	307	537	916	1,517
TSP Foundations	173	309	539	924	1,534
TSP Assembly	134	243	428	739	1,240
TSP Erection	132	239	420	726	1,219
Conductor Installation	204	364	630	1,067	1,757

Source: ARCADIS 2012

Key:

- dBA A-weighted decibels
- kV kilovolt
- Leq equivalent sound pressure level
- TSP tubular steel pole

15

1

**Table 4.11-9 Estimated Composite Noise Construction Levels at Closest Receptors for Substation Work**

Substation	Loudest Construction Activity	Noise Composite Level at Closest Receptors (dBA CNEL)	Receptor description
Carpinteria Substation (City of Carpinteria, Santa Barbara County)	Conductor installation	80	Carpinteria High School (property line)
		69	Residence located south of substation
Casitas Substation (Unincorporated Ventura County)	Trenching	70	Residence located west of the substation
		69	Residence located northwest of the substation
		65	Residence located north of the substation
Santa Clara Substation (Unincorporated Ventura County)	Trenching	43	Residence located southeast of the substation.
		41	Residence located south of the substation
		36	Residence located southwest of the substation

Source: ARCADIS 2012

Key:

CNEL Community Noise Equivalent Level

dBA A-weighted decibels

2

3

The applicant would also use small helicopters for the 66-kV subtransmission line wire stringing operations along areas where road access would not be feasible and for marker ball installation.

4

The type of helicopter to be used for subtransmission line construction would be determined in the

5

final engineering design for the proposed project. For the purposes of this EIR, the applicant has

6

indicated that a small single-rotor helicopter such as the Hughes 500E (also known as 369E) would

7

be used. This type of helicopter produces a maximum sound level of 75 dBA at a distance of 500

8

feet under level flight conditions (Nelson 1987). Additionally, the applicant has reported

9

approximate noise levels from heavy-duty helicopter flying in the range of 85 to 93 dBA at an

10

elevation of 1,000 feet (corresponds to levels of 49 to 57 dBA Leq (h)), and 80 to 85 dBA (44 to 49

11

Leq(h)) for light duty helicopters at the same elevation. Although the U.S. Forest Service

12

recommended restrictions to helicopter operations in recreational areas, the project would cross

13

USFS lands designated as developed area interface within the Los Padres National Forest; without

14

the presence of sensitive recreational uses along the proposed 0.25-mile segment.

15

16

As shown in Tables 4.11-8 and 4.11-9, receptors located in the proximity of the proposed project

17

(less than 200 feet) would be exposed to construction noise levels of 75 dBA Leq or higher, in

18

excess of the applicable standards in Santa Barbara County (Environmental Thresholds and

19

Guidelines Manual), City of Carpinteria (Resolution No. 408), and Ventura County (Construction

20

Noise Threshold Criteria and Control Plan).

21

22

Table 4.11-2 shows that three schools and three churches are located within 0.3 miles (1,600 feet)

23

of the proposed Segment 3A work areas and three schools would be located in the proximity of

24

Segment 4 in Santa Barbara County. Santa Barbara County has established a 1,600-foot distance as

25

1 the threshold of potential significance for construction projects located in the vicinity of sensitive  
2 receptors (schools, residential development, commercial lodging facilities, hospitals or care  
3 facilities) and requires limiting construction hours from receptors to weekdays between 8 a.m. and  
4 5 p.m. In addition, Santa Barbara County's thresholds states that noise attenuation barriers may be,  
5 but are not necessarily, required. APM NV-1 would require compliance with Santa Barbara County  
6 requirements during construction, which would limit work to between 8 a.m. and 5 p.m; however,  
7 significant impacts could still occur. Therefore, the applicant would implement Mitigation Measure  
8 (MM) NV-1, which requires the installation of a temporary noise attenuation barrier for  
9 construction activities within 200 feet of sensitive receptors to reduce construction noise levels to  
10 65 dBA at the property line. As a result, noise impacts on sensitive receptors in Santa Barbara  
11 County would be less than significant with mitigation.

12  
13 Several residences as well as Carpinteria High School would be located in the proximity of  
14 Carpinteria Substation, in Santa Barbara County. In the City of Carpinteria, temporary construction  
15 noise which exceeds 75 dBA CNEL for 12 hours within a 24-hour period at residences would be  
16 considered significant. However, composite noise levels at nearby residences are not expected to  
17 exceed this limit. Where temporary construction noise would substantially affect sensitive  
18 receptors, including schools, this limit would also apply. Estimated composite construction noise at  
19 the Carpinteria Substation would exceed 75 dBA at the Carpinteria High School. The applicant  
20 would implement APM NV-1, which would require compliance with the City of Carpinteria  
21 Resolution 408, which would limit construction activities of 75 dBA CNEL to 12 hours per day.  
22 Impacts on sensitive receptors in the City of Carpinteria would be less than significant.

23  
24 In addition, for vehicular traffic, the City of Carpinteria has set a noise level of 65 Leq<sup>3</sup>. An increase  
25 in noise from vehicular traffic would occur on a temporary basis, due to heavy-duty and worker  
26 commute vehicle use before and after allowed construction hours. Vehicular traffic noise depend  
27 on a range of characteristics related to vehicles and the highways on which they travel, including is  
28 vehicle type, engine size, speed, number of wheels and axels, type of tires, as well as pavement type,  
29 age, texture and condition. Noise levels from construction vehicles would also depend on traffic  
30 flow, distance to receptor, roadway segment and existing shielding. Major contributors to ambient  
31 traffic noise levels during construction would be from heavy trucks, as reference noise levels are  
32 generally over 78 dBA for speeds over 25 miles per hour (Caltrans 2009). The applicant would  
33 implement APM NV-2 and transportation and traffic control measures to control noise from trucks  
34 to the extent possible; therefore, impacts from vehicular traffic noise would be less than significant  
35 under this criterion.

36  
37 Ventura County limits construction noise to 75 dBA Leq for a maximum period of three days. There  
38 are several sensitive receptors within the vicinity of the existing Santa Clara substation where  
39 modification or subtransmission and substation equipment would occur. However, as shown in  
40 Table 4.11-9, the composite noise levels from this work would not exceed the 75dBA Leq noise  
41 limit. In addition, all work on the proposed project would be limited to three consecutive days  
42 within a single construction area. Therefore, impacts on sensitive receptors in the County of  
43 Ventura would be less than significant.

44  
45 **Impact NS-2: Excessive groundborne vibration or groundborne noise levels.**  
46 **LESS THAN SIGNIFICANT**

---

<sup>3</sup> The Ldn and Leq measures are expressed on the dBA sound level scale. For purposes of comparing noise level indices, the City of Carpinteria has established that Leq (for the peak-traffic period) is approximately equivalent to the Ldn.

1  
2 Construction vibration would result mainly from the use of heavy-duty construction equipment,  
3 e.g., trucks, backhoes, excavators, loaders, and cranes. Additional construction ground vibration  
4 sources such as the tamping or compacting of ground surfaces, the passing of heavy trucks on  
5 uneven surfaces, and the excavation of trenches would also create perceptible vibration in the  
6 immediate vicinity of the proposed project construction sites. Vehicle and heavy duty truck use  
7 during construction of the proposed project would generate a continuous but relatively low level of  
8 vibration.

9  
10 Typical maximum vibration levels from construction equipment that would be used for the proposed  
11 project is shown in Table 4.11-10.  
12

**Table 4.11-10 Typical Vibration Source Levels for Project Construction  
Equipment and Estimated Levels at Sensitive Receptors**

Equipment Type	PPV at 25 feet (in/sec)	Vibration Level at 25 feet (VdB)	Vibration Level at 50 feet (VdB)	Vibration Level at 158 feet (VdB)
Large bulldozer	0.089	87	78	63
Loaded trucks	0.076	86	77	62
Jackhammer	0.035	79	70	55
Small bulldozer	0.003	58	49	34

Source: FTA 2006

Note: Annoyance or interference with vibration-sensitive activities at different distances

Key:

in/sec inches per second

PPV peak particle velocity

VdB vibration decibels

13  
14 As shown in the Table 4.11-10, heavy-duty equipment and vehicles involved in project construction  
15 would generate vibration levels ranging between 58 and 87 VdB at 25 feet during short-term  
16 construction activities, restricted to daytime hours. All receptors located at a distance of 50 feet or  
17 beyond would perceive levels below 80 VdB, which is generally acceptable at residential areas for  
18 activities that involve less than 30 vibration events of the same kind per day (FTA 2006). Closest  
19 sensitive receptors identified in Table 4.11-2 (0.03 miles or 158 feet) would perceive a maximum  
20 vibration level of 63 VdB, which is below the human perception threshold (65VdB). Construction-  
21 related vibration would only exceed the human perception threshold for receptors located within  
22 50 feet from heavy-duty equipment; these effects would be transient at all the proposed project  
23 locations and attenuated (i.e., reduced in intensity) over distance; therefore, impacts on this  
24 criterion are less than significant.  
25

26 **Impact NS-3: Permanent increase in ambient noise levels in the project vicinity.**  
27 LESS THAN SIGNIFICANT  
28

29 Operations and maintenance would require use of vehicles and aircraft. As mentioned before, noise  
30 from trucks, commuter vehicles, and other on-road equipment, which would mainly be along  
31 streets and access roads during operation and maintenance activities, would produce peak levels of  
32 approximately 88 dBA at 50 feet from the source (FTA 2006).The use of such vehicles would be  
33 occasional and would be similar to existing operations and maintenance procedures. The applicant  
34 would also use helicopters as part of annual maintenance inspections and occasional operational

1 support or repairs in areas of difficult vehicular access. The proposed project would not involve  
2 additional sources of noise, such as transformers or other noise-generating permanent equipment  
3 for operations and maintenance.

4  
5 Corona noise from upgraded subtransmission lines, as well as vehicle and air traffic noise  
6 associated with routine inspections and repairs could occur. The corona effect is the ionization of  
7 the air that occurs at the surface of the energized conductor and suspension hardware due to very  
8 high electric field strength at the surface of the metal during certain conditions. The corona  
9 discharge occurs at the conductor surface, representing a small dissipation of heat and energy in  
10 the form of local pressure changes that may result in audible noise or radio and television  
11 interference. The corona discharge generates audible noise during operation of transmission lines  
12 and substation equipment, and this noise is generally characterized as a crackling or hissing sound  
13 that may be accompanied by a 120-Hertz hum.

14  
15 The amount of corona produced by a transmission line is a function of the voltage of the line, the  
16 diameter of the conductor, the elevation of the line above sea level, the condition of the conductor  
17 and hardware, and the local weather conditions. The noise is most noticeable during wet conductor  
18 conditions such as rain or fog; however, during fair weather, insects and dust on the conductors  
19 can also serve as sources of corona. Studies conducted by the Electrical Power Research Institute  
20 (EPRI) have reported that audible noise has not been a problem on lines operating below 200 kV,  
21 even if the line is built at a very high altitude and/or the hardware is improperly designed (EPRI  
22 2007).

23  
24 Corona noise associated with operation of the subtransmission line segments would be similar to  
25 existing corona noise in the area. Therefore, there would be no significant change in ambient noise  
26 levels in the project vicinity, resulting in a less than significant impact under this criterion.

27  
28 **Impact NS-4: Substantial temporary or periodic increase in ambient noise levels in the**  
29 **project vicinity.**

30 **LESS THAN SIGNIFICANT WITH MITIGATION**

31  
32 It is expected that noise levels from construction equipment and vehicle and helicopter use would  
33 result in temporary contributions to the ambient noise levels in the project vicinity during the  
34 overall 24-month construction period. As discussed in Impact NS-1, potential noise levels during  
35 construction may at times range between 75 to 80 dBA Leq for sensitive receptors located within  
36 200 feet of the proposed project construction areas, including residences, schools, and places of  
37 worship. Most of the closest sensitive receptors would be exposed to a temporary increase in noise  
38 levels over 10 dBA above existing ambient levels (Table 4.11-3), which is above the 3- to 5-dBA  
39 range identified as threshold by all jurisdictions in the proposed project area. In particular, Santa  
40 Barbara County identifies an increase of 10 dBA as potentially significant when existing ambient  
41 noise levels are below 55 dBA.

42  
43 The applicant would implement APM NV-1 thru APM NV-5 to reduce potential impacts at the  
44 closest sensitive receptors. The APMs would require the applicant to phase construction activities,  
45 use noise barriers, use equipment and vehicles with noise control features and notify local  
46 property owners prior to construction. Impacts from noise would remain to be potentially  
47 significant. The applicant would implement MM NV-1, which defines the requirements for  
48 additional noise reduction and control practices to ensure that noise levels from proposed  
49 construction activities would comply with applicable jurisdictional guidelines related to temporary  
50 or periodic increases in ambient noise levels and would reduce noise levels at the receptor's

1 property line. Impacts from temporary or periodic increase in ambient noise levels in the project  
2 vicinity would be less than significant with mitigation.

#### 4 4.11.4 Mitigation Measures

5  
6 **MM NV-1: Noise Reduction and Control Practices.** The applicant will employ a combination of  
7 the following noise reduction and control practices during the proposed 66-kV subtransmission  
8 line, telecommunication route installation, and substation work to ensure that the temporary  
9 increase in ambient noise level will not exceed maximum allowable levels  
10 identified by the applicable jurisdiction, measured at the closest sensitive receptor property  
11 boundary threshold is not exceeded:

- 13 • Construction equipment, stationary or mobile, will be equipped with properly operating  
14 and maintained mufflers on engine exhausts and compressor components.
- 15 • The number and duration of construction equipment and vehicle idling on site will be  
16 limited, in accordance with APM AQ-2.
- 17 • Temporary acoustic barriers or sound curtains (e.g., removable blankets or curtains made  
18 of composite materials that block and absorb noise) will be used along the perimeter wall  
19 of work areas as needed to reduce noise when construction activities occur within 200 feet  
20 of a sensitive receptor at any single location or within 1,600 feet of sensitive receptors ~~in~~  
21 ~~Ventura County~~ for activities lasting more than 3 consecutive days at a single location.  
22 Noise barriers or sound curtains will be selected with a sound transmission class of 30 or  
23 greater, in accordance with American Society for Testing and Materials Test Method E90.  
24 The noise absorbing material will be 2-inches thick and have a Noise Reduction Coefficient  
25 rating of 0.85 or greater, based on American Society for Testing and Material Method C423.  
26 The barrier height will be designed to break the line of sight and provide at least a 5-dBA  
27 insertion loss between the noise source and the closest sensitive receptor.
- 28 • Helicopter use during 66-kV subtransmission and overhead telecommunication line  
29 installations will avoid flying below 1,000 feet over sensitive receptors, when feasible. If  
30 helicopter use is required below 1,000 feet over sensitive receptors, the applicant will  
31 notify affected parties at least within 48 hours prior to helicopter use.
- 32  
33 • Prior to the start of construction, the applicant shall prepare a Noise Control Plan for the  
34 construction of the proposed project. The applicant shall submit the Noise Control Plan to  
35 the CPUC at least 30 days prior to the start of construction for review and approval. The  
36 Noise Control Plan shall detail the frequency, location and methodology for noise  
37 monitoring prior to and during various construction activities to ensure that generated  
38 noise levels do not exceed the maximum allowable levels identified by the applicable  
39 jurisdiction.