

## 5.0 NOISE

Ambient noise is affected by the topography of a given geographic area, nearby development, and proximity to transportation, both roadways and railroads. The area of the proposed project is subject to numerous types of noise that create the potential for sensitive receptors to be affected. This chapter describes relevant characteristics of noise in the *Dry Creek/West Placer Community Plan* (or *Community Plan*) and discusses how noise affects these sensitive receptors. This chapter provides an overview of the existing noise within *Community Plan* area and evaluates potential impacts to noise that could result from implementation of the proposed project.

### 5.1 ENVIRONMENTAL SETTING

#### 5.1.1 Characteristics of Environmental Noise

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute pressure variations, which travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by a number of variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. The minimum change in the sound level of sound energy averaged over time that an average human ear can detect is about 3 dB. An increase (or decrease) in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relationship generally holds true for both loud sounds and for quieter sounds.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:  $60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}$  and  $80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$ .

Hertz is an indicator of the rate at which pressure fluctuations occur. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. A particular tone that makes the drum skin vibrate 100 times per second generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 Hz and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork contains a single frequency referred to as a tone. In contrast, most sounds one hears in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system that reflects how human hearing is less sensitive at lower frequencies and higher frequencies than at the mid-range frequencies,

about 200 Hz to 5,000 Hz. The most commonly used filter introduces an “A” weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level ( $L_{eq}$ ) is used. The  $L_{eq}$  is the energy-mean A-weighted sound level during a measured time interval. It is the “equivalent” constant sound level that would have to be produced by a given source to equal the fluctuating level measured.

Finally, two other descriptors describe noise exposure over a 24-hour period. The first is known as the day-night average noise level ( $L_{dn}$ ). It is calculated by adding a 10-dB penalty to sound levels at night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter nighttime hours. The community noise equivalent level (CNEL) is the same as  $L_{dn}$ , with the exception of adding a 5-dB penalty to sound levels during the evening hours (7:00 p.m. to 10:00 p.m.). The  $L_{dn}$ /CNEL is used by jurisdictions such as the State of California and Placer and Sacramento counties to define acceptable land use compatibility with respect to noise. Sound levels of typical noise sources and environments are provided in **Table 5-1** to provide a frame of reference.

### **5.1.2 Vibration**

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person’s perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the object which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibrations in terms of peak particle velocities using units of inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities. For the proposed project, vibration may be a concern during construction-related activities that incorporate impulse-type equipment such as jack hammers or vibratory compactors. Such activities could cause annoyance to sensitive uses in the project vicinity and/or damage to buildings. An analysis of construction-related vibration levels is contained within this Focused Draft EIR.

### **5.1.3 Regional Setting**

Ambient sound levels can be characterized based on the types of development present. Typically, sound levels in residential areas, if not affected by a major roadway, are relatively low. Sound levels near commercial areas or along arterial roadways are typically higher than residential areas.

Major noise sources in the *Community Plan* area are primarily transportation-related. Traffic on local roadways and railroads contribute significantly to noise environments in their immediate vicinity. In addition to traffic noise on local roadways and railroads, aircraft traffic from community and commercial airports in both Placer and Sacramento counties, such as the Lincoln Airport, Rio Linda Airport, and McClellan Airport, also contribute to the regional noise environment.

**Table 5-1  
Sound Levels of Typical Noise Sources and Noise Environments**

<b>Noise Source (at Given Distance)</b>	<b>Noise Environment</b>	<b>A-Weighted Sound Level</b>	<b>Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels)</b>
Military jet takeoff with afterburner (50 ft)	Carrier flight deck	140 Decibels	128 times as loud
Civil defense siren (100 ft)		130	64 times as loud
Commercial jet takeoff (200 ft)		120	32 times as loud Threshold of Pain
Pile driver (50 ft)	Rock music concert	110	16 times as loud
Ambulance siren (100 ft) Newspaper press (5 ft) Power lawn mower (3 ft)		100	8 times as loud Very Loud
Motorcycle (25 ft) Propeller plane flyover (1,000 ft) Diesel truck, 40 mph (50 ft)	Boiler room Printing press plant	90	4 times as loud
Garbage disposal (3 ft)	Higher limit of urban ambient sound	80	2 times as loud
Passenger car, 65 mph (25 ft) Living room stereo (15 ft) Vacuum cleaner (3 ft)		70	Reference loudness Moderately loud
Normal conversation (5 ft) Air-conditioning unit (100 ft)	Data processing center Department store	60	1/2 as loud
Light traffic (100 ft)	Private business office	50	1/4 as loud
Bird calls (distant)	Lower limit of urban ambient sound	40	1/8 as loud Quiet
Soft whisper (5 ft)	Quiet bedroom	30	1/16 as loud
	Recording studio	20	1/32 as loud Just Audible
		10	1/64 as loud
		0	Threshold of hearing

Source: URS Corporation, 2006

### 5.1.4 Local Setting

The *Dry Creek/West Placer Community Plan* area is located in western Placer County near the Sacramento/Placer county line. The *Community Plan* area covers approximately 9,200 acres in southwestern Placer County. Its boundaries are Baseline Road on the north, the Placer/Sutter County line to the west, the Placer/Sacramento county line to the south, and the City of Roseville to the east. The Roseville Rail Yard is less than ¼ mile from the southeast portion of the project area. Interstate 80 (I-80) is approximately 2 miles to the east of the easternmost boundary of the *Community Plan* area. The Lincoln Airport is located approximately 10 miles north, while the Rio Linda and McClellan Air Force Base (AFB) are approximately 3.5 miles south of the *Community Plan* area.

#### Existing Noise Levels

The existing noise environment consisted primarily of transportation noise sources on the local roadway network. Train and aircraft noise also contribute to the ambient noise environment throughout the *Community Plan* area. A series of sound level measurements was conducted from December 10, 2008 through December 12, 2008, to quantify the existing noise environment. Measurements were conducted at the locations shown on **Figure 5-1**, with short-term ambient noise measurements of 15 minutes in duration being attended, with concurrent observations of traffic conditions, and continuous ambient noise measurements of 24 hours in duration.

#### Short-Term Noise Level Measurements

Short-term ambient noise data were gathered using Larson Davis Model 824 ANSI (American National Standards Institute) Type 1 Integrating Sound Level Meter. The meter was field-calibrated before each measurement period with a Larson Davis Model CAL200 acoustic calibrator. The meter was mounted on a tripod 5 feet above the ground to simulate the average height of the human ear. The details for each measurement are described below. The results of the short-term measurements are summarized in **Table 5-2**.

- |        |  |
|--------|--|
| Site 1 | This site is approximately 100 feet from the center of the intersection of Watt Avenue and PFE Road near the Placer County and Sacramento County line. Surrounding land uses include agricultural to the northeast and southeast, residential to the west and northwest, and school zone to the southwest. Existing noise sources included vehicular traffic on Watt Avenue and PFE Road, and aircraft overflights from McClellan AFB. |
| Site 2 | This site is approximately 100 feet from the center of the intersection of PFE Road and Billy Mitchell Boulevard. Surrounding land uses include residential uses to the north, east, south, and west. Existing noise sources include vehicular traffic on PFE Road. Traffic on Billy Mitchell Boulevard was observed to be extremely light.  |
| Site 3 | This site is approximately 100 feet from the center of the intersection of PFE Road and Pinehurst Drive. Surrounding land uses include residential to the north, west, and east, and agricultural to the south. Existing noise sources include vehicular traffic on PFE Road. Traffic on Pinehurst Drive was observed to be light to moderate.   |
| Site 4 | This site is approximately 100 feet from the center of the intersection of Cook-Riolo Road and Jimmy Way. Surrounding land uses include residential uses to the west, and east. A vacant lot was located on the northwest quadrant of the intersection. Existing noise sources include vehicular traffic on Cook-Riolo Road.   |

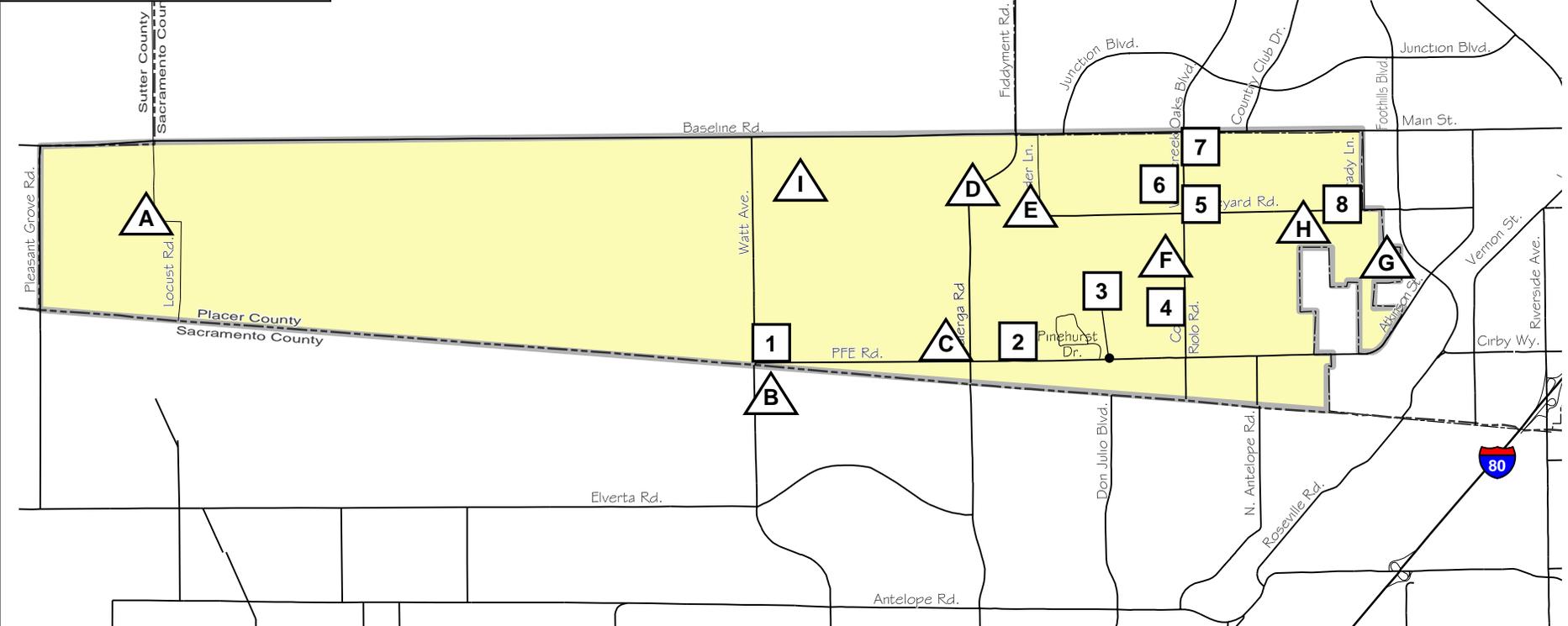


**LEGEND**

- Community Plan Boundary
- County Line
- Continuous Noise Measurement Site
- Short-Term Noise Measurement Site



**N**  
NOT TO SCALE



Source:  
Study Area Map: Fehr & Peers, 2009a  
Noise Measurement Locations: j.c. brennan & associates, 2009

**NOISE MEASUREMENT LOCATIONS**

June 2010  
28067005  
Dry Creek/West Placer  
Community Plan Update  
Placer County, CA



**FIGURE 5-1**

N:\2006\Projects\2284\_Dry\_Creek\_Community\_Plan\GIS\Draft\Report\_2\_20\_07\fig01\_study\_area.mxd

**Table 5-2  
Short-Term Ambient Noise Level Measurements**

Measurement Location	Location Description 100 feet from Center of Intersection	Time	Date	L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>
1	Northeast quadrant of the Watt Avenue and PFE Road intersection.	10:57 to 11:12 a.m.	12/10/08	58.9 dB	51.9 dB	78.3 dB
2	North of the PFE Road and Billy Mitchell Boulevard intersection.	1:01 to 1:16 p.m.	12/10/08	58.8 dB	52.1 dB	76.4 dB
3	Northeast quadrant of the Pinehurst Drive and PFE Road intersection.	1:25 to 1:40 p.m.	12/10/08	62.7 dB	55.1 dB	76.7 dB
4	Southwest quadrant of the Cook-Riolo Road and Jimmy Way intersection.	1:51 to 2:06 p.m.	12/10/08	57.2 dB	53.9 dB	67.8 dB
5	Northeast quadrant of the Cook-Riolo Road and Vineyard Road intersection.	2:45 to 3:00 p.m.	12/10/08	61.1 dB	55.8 dB	80.5 dB
6	West of the Cook-Riolo Road and Central Avenue intersection.	3:08 to 3:23 p.m.	12/10/08	57.4 dB	46.8 dB	74.0 dB
7	Southeast quadrant of the Cook-Riolo Road and Baseline Road intersection.	3:28 to 3:43 p.m.	12/10/08	67.1 dB	61.9 dB	86.6 dB
8	Northwest quadrant of the Brady Lane and Vineyard Road intersection.	2:21 to 2:36 p.m.	12/10/08	56.4 dB	48.0 dB	68.1 dB

Source: j.c. brennan & associates, 2009

Notes: L<sub>50</sub> = median sound level  
 L<sub>eq</sub> = energy average sound level  
 L<sub>max</sub> = maximum sound level

Site 5 This site is approximately 100 feet from the center of the intersection of Cook-Riolo Road and Vineyard Road. Surrounding land uses include residential uses to the west, north, east, and south. The new Creekview Ranch Middle School is located approximately 1,600 feet south of this site. Access to the school is served by Cook-Riolo Road. Existing noise sources include vehicular traffic on Cook-Riolo Road and Vineyard Road.

Site 6 This site is approximately 100 feet from the center of the intersection of Cook-Riolo Road and Central Avenue (south). Surrounding land uses include single-family residential uses to the north, east, south, and west. Existing noise sources include vehicular traffic on Cook-Riolo Road. Traffic on Central Avenue (south) was observed to be light. Additionally, small livestock was located at surrounding residential uses to the north, east, south, and west.

Site 7 This site is approximately 100 feet from the center of the intersection of Cook-Riolo Road and Baseline Road. Surrounding land uses include single-family residential uses to the north, east, south, and west. Existing noise sources include vehicular traffic on Baseline Road and Cook-Riolo Road.

Site 8 This site is approximately 100 feet from the center of the intersection of Vineyard Road and Brady Lane. Surrounding land uses include single-family residential to the north,

east, and south, and vacant agricultural use to the west. Existing noise sources include vehicular traffic on Vineyard Road and distant vehicular traffic on Foothills Boulevard.

### Continuous Noise Level Measurements

Continuous noise level data were gathered using Larson Davis Model 820 ANSI Type 1 Integrating Sound Level Meters. The sound level meters were programmed to collect hourly noise level intervals at each site during the survey. The maximum value ( $L_{max}$ ) represents the highest noise level measured during an interval. The average value ( $L_{eq}$ ) represents the energy average of all of the noise measured during an interval. The median value ( $L_{50}$ ) represents the sound level exceeded 50 percent of the time during an interval. The meters were placed in watertight containers, and the microphone was mounted securely on a tripod within an environmental shroud so that the microphone was approximately 5 feet above ground level. The results of the continuous noise measurements are summarized in **Table 5-3**, and are shown graphically in **Appendix F**. The details for each measurement are described below.

- Site A This continuous noise measurement site was located at 8314 Locust Road. This site represents residential land uses in the western portion of the *Community Plan* area. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Locust Road and aircraft overflights from small, single-engine planes.
- Site B This continuous noise measurement site was located at 8718 Watt Avenue. This site represents residential land uses in the southwestern portion of the *Community Plan* area and off-site residential uses in Sacramento County. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Watt Avenue and aircraft overflights from McClellan AFB.
- Site C This continuous noise measurement site was located at 4520 PFE Road. This site represents residential land uses in the southern portion of the *Community Plan* area. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on PFE Road.
- Site D This continuous noise measurement site was located at 8522 Bridgestone Crescent. This site represents residential land uses in the northern portion of the *Community Plan* area. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Walerga Road.
- Site E This continuous noise measurement site was located at 4009 Wakehurst Court. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Crowder Lane.
- Site F This continuous noise measurement site was located at 8600 Cook-Riolo Road. This site represents residential land uses along Cook-Riolo Road adjacent to the new Creekview Ranch Middle School. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Cook-Riolo Road.
- Site G This continuous noise measurement site was located at 2132 Beatty Court. This site represents residential land uses adjacent to Foothills Boulevard in the southeastern portion of the *Community Plan* area. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Foothills Boulevard.

**Table 5-3  
Continuous Noise Level Measurements**

Measurement Location	Location Description	Date	Time	L <sub>dn</sub>	Daytime			Nighttime		
					L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>	L <sub>eq</sub>	L <sub>50</sub>	L <sub>max</sub>
A	8314 Locust Road	December 11-12, 2008	4:00 pm – 3:00 pm	52.0 dB	49.1 dB	41.9 dB	68.2 dB	44.6 dB	37.7 dB	62.9 dB
B	8718 Watt Avenue	December 11-12, 2008	4:00 pm – 3:00 pm	58.8 dB	56.6 dB	53.9 dB	71.7 dB	51.0 dB	42.7 dB	67.8 dB
C	4520 PFE Road	December 11-12, 2008	4:00 pm – 3:00 pm	58.8 dB	57.2 dB	52.2 dB	73.2 dB	50.6 dB	41.5 dB	68.9 dB
D	8522 Bridgestone Crescent	December 11-12, 2008	3:00 pm – 2:00 pm	58.2 dB	54.0 dB	52.4 dB	64.7 dB	51.2 dB	48.3 dB	63.1 dB
E	4009 Wakehurst Court	December 10-11, 2008	2:00 pm – 1:00 pm	53.0 dB	52.4 dB	43.3 dB	69.8 dB	43.8 dB	36.0 dB	61.3 dB
F	8600 Cook-Riolo Road	December 10-11, 2008	1:00 pm – 12:00 pm	53.5 dB	51.4 dB	46.8 dB	65.8 dB	45.7 dB	39.3 dB	61.2 dB
G	2132 Beatty Court	December 10-11, 2008	12:00 pm – 11:00 am	64.2 dB	60.1 dB	58.3 dB	73.9 dB	57.2 dB	54.7 dB	71.7 dB
H	1815 Vineyard Road	December 10-11, 2008	1:00 pm – 12:00 pm	57.3 dB	53.3 dB	49.3 dB	68.5 dB	50.4 dB	47.1 dB	66.0 dB
I*	South of Baseline Road and east of Watt Ave	September 24-25, 2008	1:00 pm – 12:00 pm	50.9 dB	45.5 dB	39.1 dB	63.5 dB	44.3 dB	40.7 dB	56.2 dB

Source: j.c. brennan & associates, 2009

Notes: \* Data were gathered for the Placer Vineyards Specific Plan Amendment, 2008

- L<sub>dn</sub> = day-night average noise level
- L<sub>50</sub> = medium sound level
- L<sub>eq</sub> = energy average sound level
- L<sub>max</sub> = maximum sound level

- Site H This continuous noise measurement site was located at 1815 Vineyard Road. This site represents residential land uses near in the eastern portion of the *Community Plan* area. Surrounding land uses include single-family residential. Existing noise sources include vehicular traffic on Vineyard Road.
- Site I This continuous noise measurement site was located approximately 800 feet south of Baseline Road and east of Watt Avenue. The data gathered at this site were initially collected for the Placer Vineyards Specific Plan Amendment in September 2008. The surrounding land uses include vacant agriculture to the north, east, and west, and active agriculture to the south. Existing noise sources include vehicular traffic on Baseline Road and Watt Avenue. Noise from livestock added to the ambient noise environment.

### Existing Traffic Noise Levels

To determine the existing traffic noise levels at noise sensitive land uses within the project vicinity, j.c. brennan & associates, Inc. employed the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA Model is based upon the Calveno reference noise factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model inputs consisted of existing PM peak traffic volumes obtained from the *Dry Creek West Placer Community Plan: Transportation Element Update Traffic Study* (January 28, 2009) and subsequent *Alternative 5 Results for the Dry Creek/West Placer Community Plan – Transportation Element Update* (June 22, 2009) prepared for the proposed project and j.c. brennan & associates, Inc. A complete listing of the FHWA model inputs is provided in **Appendix F**.

**Table 5-4** shows the predicted existing traffic noise levels in terms of the  $L_{dn}$  at a standard distance from the centerlines of pertinent existing *Community Plan* roadways for existing conditions, as well as distances to existing traffic noise contours. The extent by which existing land uses in the *Community Plan* area are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

### 5.1.5 Sensitive Receptors

This section identifies sensitive receptors/land uses throughout the proposed project area. A discussion of the noise impacts affecting these receptors is discussed in **Section 5.3 (Impacts)**. Sensitive individuals refer to those segments of the population most susceptible to noise increases (i.e., residential dwellings, schools, libraries, hospitals, and churches). Sensitive receptors/land uses are located throughout the *Community Plan* area. The following lists the noise-sensitive receptors that are most likely to be impacted by noise associated with the roadway improvement projects proposed under the Proposed Project:

- Residential dwellings – approximately 50 to 75 feet from Cook-Riolo Road (Central Avenue to Baseline);
- Residential dwellings – approximately 40 to more than 100 feet from PFE Road (Billy Mitchell Boulevard to Cook- Riolo Road);
- Dry Creek Elementary School – at the corner of PFE Road and Cook-Riolo Road; and
- Creekview Ranch Middle School – on the east side of Cook-Riolo Road, and north of Dry Creek.

**Table 5-4  
Existing Traffic Noise Levels within the Community Plan Area**

Roadway	Segment	Distance <sup>a</sup>	Traffic Noise Level, L <sub>dn</sub>	Distance to L <sub>dn</sub> Traffic Noise Contours		
				70 dBA	65 dBA	60 dBA
Baseline Road	Locust to Watt	100 feet	65.4	49	106	229
Baseline Road	Watt to Walerga	100 feet	66.2	56	121	260
Baseline Road	Walerga to Cook-Riolo Road	100 feet	64.4	42	91	196
Baseline Road	Cook-Riolo Road to Brady	100 feet	65.4	50	107	230
Baseline Road	Brady to Foothills	100 feet	65.4	50	107	230
Vineyard Road	West of Cook-Riolo Road	100 feet	55.1	10	22	47
Vineyard Road	Cook-Riolo Road to Brady	100 feet	58.0	16	34	73
Vineyard Road	Brady to Foothills	100 feet	58.7	18	38	82
PFE Road	Watt to Walerga	100 feet	59.8	21	45	96
PFE Road	Walerga to Pinehurst	100 feet	61.6	28	60	128
PFE Road	Pinehurst to Cook-Riolo Road	100 feet	60.7	24	52	111
PFE Road	Cook-Riolo Road to N. Antelope	100 feet	61.2	26	56	121
PFE/Atkinson Road	East of N. Antelope	100 feet	62.4	31	68	145
Cirby Way	Foothills to Riverside	100 feet	69.0	86	184	397
Cirby Way	East of Riverside	100 feet	66.8	61	132	283
Watt Avenue	Baseline to PFE	100 feet	61.6	27	59	127
Watt Avenue	PFE to Elverta	100 feet	65.9	53	115	248
Fiddymont Road	North of Baseline	100 feet	66.0	54	116	249
Walerga Road	Baseline to PFE	100 feet	64.8	45	97	208
Woodcreek Oaks	North of Baseline	100 feet	59.7	21	45	96
Cook-Riolo Road	Baseline to Vineyard	100 feet	56.7	13	28	60
Cook-Riolo Road	Vineyard to PFE	100 feet	56.1	12	26	55
Brady Lane	Baseline to Vineyard	100 feet	50.1	5	10	22
Foothills Boulevard	Baseline/Main to Vineyard	100 feet	67.2	65	141	304
Foothills Boulevard	South of Vineyard	100 feet	68.5	80	171	369

Source: j.c. brennan & associates, 2009

**Notes:**

- <sup>a</sup> Distances are referenced from centerline of roadway
- dBA = A-weighted decibel
- L<sub>dn</sub> = day-night average noise level

## 5.2 REGULATORY SETTING

Federal standards are not applicable, given the absence of federal funding for the proposed project or affected federal lands. State-defined standards are discussed below in terms of the General Plans of Placer County, Sacramento County, and the City of Roseville. Local standards include noise ordinances and special provisions pertaining to Placer County.

### Placer County General Plan

The *Placer County General Plan* contains policies governing noise related to projects within Placer County. The maximum allowable noise exposure limits for transportation noise sources in Placer County are summarized in **Table 5-5**. The standard applicable to the proposed project in Placer County for transportation noise sources is an  $L_{dn}$  of 60 dBA. The *Placer County General Plan – Noise Element* does not address construction noise level limits. *General Plan* policies and goals relating to transportation and circulation that are applicable to the proposed project include the following:

- Goal 9.A To protect County residents from the harmful and annoying effects of exposure to excessive noise.
- Policy 9.A.9 Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in [General Plan] Table 9-3 at outdoor activity areas or interior spaces of existing noise-sensitive land uses.
- Policy 9.A.11 The County shall implement one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses, or where the cumulative increase in noise levels resulting from new development significantly impacts noise-sensitive land uses:
- a. Rerouting traffic onto streets that have available traffic capacity and that do not adjoin noise-sensitive land uses;
  - b. Lowering speed limits, if feasible and practical;
  - c. Programs to pay for noise mitigation such as low cost loans to owners of noise-impacted property or establishment of developer fees;
  - d. Acoustical treatment of buildings; or
  - e. Construction of noise barriers.

### Placer County Noise Ordinance

The Placer County Municipal Code contains an explicit Noise Ordinance. Section 9.36.030 A.7 of the Ordinance provides an exception for construction noise so long as all construction equipment is “fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.” Allowable time periods for this construction noise are as follows: 6 a.m. to 8 p.m., Monday through Friday; and 8 a.m. to 8 p.m., Saturdays and Sundays. However, Planning Commission revisions to the Placer County Board of Supervisors Minute Order 90-08 indicate the following:

**Table 5-5  
Placer County Maximum Allowable Noise Exposure for Transportation Noise Sources**

Land Use	Outdoor Activity Areas <sup>a</sup>	Interior Spaces	
	Ldn/CNEL	Ldn/CNEL	Leq, dBb
Residential	60 <sup>c</sup>	45	
Transient Lodging	60 <sup>c</sup>	45	
Hospitals, Nursing Homes	60 <sup>c</sup>	45	
Theaters, Auditoriums, Music Halls			35
Churches, Meeting Halls	60 <sup>c</sup>		40
Office Buildings			45
Schools, Libraries, Museums			45
Playgrounds, Neighborhood Parks	70		

**Source:** Table 9-3 of the Noise Element of the *Placer County General Plan* (1994)

**Notes:**

CNEL = Community Noise Equivalent Level

L<sub>dn</sub> = day-night average noise level

L<sub>eq</sub> = energy average sound level

<sup>a</sup> Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

<sup>b</sup> As determined for a typical worst-case hour during periods of use.

<sup>c</sup> Where it is not possible to reduce noise in outdoor activity areas to 60 L<sub>dn</sub>/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L<sub>dn</sub>/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

“Construction noise emanating from any construction activities for which a Grading or Building Permit is required is prohibited on Sundays and Federal Holidays, and shall only occur:

- a) Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings)
- b) Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time)
- c) Saturdays, 8:00 a.m. to 6:00 p.m.

In addition, temporary signs shall be located throughout the project vicinity, as determined by the Development Review Committee, at key intersections depicting the above construction hour limitations.”

**Dry Creek/West Placer Community Plan**

The *Community Plan – Community Development Element: Noise Section* provides additional specific goals and policies aimed at addressing noise. Goals and policies in the *Community Plan – Community Development Element: Noise Section* parallel those identified in *Placer County General Plan. Community Plan – Community Development Element: Noise Section* policies and goals potentially applicable to the proposed project are summarized below:

**Community Development: Noise Goals and Policies**

Goal 1 Noise: To protect the health, safety, and welfare of the Dry Creek-West Placer area residents by providing a livable environment free from excessive noise.

- 
- |           |   |
|-----------|---|
| Goal 2    | Noise: Locate noise-sensitive land uses within areas of acceptable community noise equivalent levels (CNEL).  |
| Goal 3    | Noise: Correlate noise concerns with community design, land use, circulation and open space.  |
| Policy 1  | Encourage the use of green belts or natural areas along roadways as a design feature of any development in order to mitigate noise impacts.                               |
| Policy 2  | Continue a program of monitoring noise sources to assure conformance with noise standards adopted in the Placer County Noise Element.                                     |
| Policy 3  | Avoid the interface of noise-producing and noise-sensitive land uses.   |
| Policy 4  | Require implementation of noise abatement techniques within new projects where warranted.   |
| Policy 5  | Require traffic noise mitigation for Low-Density Residential land uses located along major arterials.   |
| Policy 6  | Require project-specific noise studies for most commercial, office, public, institutional and residential projects.   |
| Policy 8  | Where noise levels have a potential to be in excess of normally acceptable CNEL levels, landscaped setbacks should be considered versus sound walls for noise mitigation. |
| Policy 11 | Protect existing residential areas from excessive noise levels generated by the development of the Plan Area.   |
| Policy 13 | The location and design of transportation facilities shall be developed in a manner which minimizes the effects of noise on adjacent land uses.                           |

#### **Community Development: Land Use**

- |      |  |
|------|--|
| Goal | To locate noise sensitive land uses within areas of acceptable noise levels. |
|------|--|

#### **Community Development: Community Design**

- |           |  |
|-----------|--|
| Policy 15 | In place of sound wall construction, require, wherever possible, the use of greater setbacks to provide a scenic corridor for all parcels fronting on all the major circulation routes (2, 4, or 6 lanes of traffic). Long expanses of sound walls are not consistent with the desired character of the Plan area and the use of open space setbacks and landscaping instead, will be a major difference between this area and surrounding areas to the north and south. |
|-----------|--|

### **City of Roseville General Plan**

The City of Roseville, which is adjacent to the Plan area, has a *General Plan Noise Element* bearing many goals and policies similar to those of Placer County. The influence of the proposed project on traffic volumes in the City of Roseville is considered in this analysis on roadways such as Foothills Boulevard, Cirby Way, and Woodcreek Oaks. Additionally, a continuous noise measurement site (Site G) in the City of Roseville adjacent to Foothills Boulevard was included as part of the project noise study. Noise regulations from the

City of Roseville municipal code (9.24) resemble those of Placer County, but differ in the following important respects:

- Construction noise occurring on Mondays through Fridays is only allowable during the daytime hours of 7:00 a.m. through 7:00 p.m.

### Sacramento County General Plan

Sacramento County, which is adjacent to the *Community Plan* area, has a *General Plan Noise Element* bearing many goals and policies similar to that of Placer County. The influence of the proposed project on traffic on Watt Avenue is considered in this analysis. Additionally, a continuous noise measurement site (Site G) in Sacramento County, adjacent to Watt Avenue, was included as part of the project noise study.

### Criteria for Acceptable Vibration

The *Placer County General Plan – Noise Element* does not contain specific policies pertaining to vibration levels. Human and structural responses to different vibration levels are influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. **Table 5-6**, which was developed by the California Department of Transportation (Caltrans), shows the vibration levels which would normally be required to result in damage to structures. The vibration levels are presented in terms of peak particle velocity in inches per second.

**Table 5-6  
Effects of Various Vibration Levels on People and Buildings**

Peak Particle Velocity (ppv)		Human Reaction	Effect on Buildings
inches/second	mm/second		
0.006 to 0.019	0.15 to 0.30	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	2.0	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	2.5	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
0.20	5.0	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of “architectural” damage to normal dwellings – houses with plastered walls and ceilings.
0.4 to 0.6	10 to 15	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possibly minor structural damage.

Source: Caltrans, 2002

The **Table 5-6** data indicate that the threshold for damage to structures ranges from 0.4 to 0.6 inches per second (in/sec) peak particle velocity (ppv). The general threshold at which human annoyance generally occurs is noted as 0.1 in/sec ppv, while the threshold of perception is approximately 0.006 to 0.019 in/sec ppv.

## 5.3 IMPACTS

This section identifies and discusses the environmental noise impacts resulting from the proposed project, and suggests mitigation measures to reduce the level of impact. A detailed discussion of mitigation measures is included in **Section 5.4**.

### 5.3.1 Standards of Significance

In accordance with Appendix G of the state CEQA Guidelines, Placer County has determined that a project would result in a significant adverse noise impact if any of the following conditions were to occur:

- Exposure of persons to or generation of noise levels in excess of standards established in the *Placer County General Plan – Noise Element*; specifically, exterior and interior noise levels of 60 dB L<sub>dn</sub> and 45 dB L<sub>dn</sub>, respectively, for new transportation noise sources or roadway improvement projects;
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels; specifically, a threshold of 0.2 in/sec ppv is considered a safe criterion that would protect against architectural or structural damage, and annoyance to people;
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as 4 dB, or greater;
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, typically defined as 4 dB, or greater;
- 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, where the project would expose people residing or working in the area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, where the project would expose people residing or working in the project area to excessive noise levels.

For this proposed project, the significance of anticipated noise effects is based on a comparison between predicted traffic noise levels associated with the proposed project and the No Project Alternative. For this project, noise impacts are considered significant if noise-sensitive land uses would be exposed to noise levels in excess of the Noise Element standards as described earlier in this chapter, or if the project would result in a traffic noise level increase of 4 dB, or greater.

### Construction

Noise impacts from construction would result from the operation of construction equipment. The magnitude of impact would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, the number of sources operating concurrently, the duration of the construction phase, the distance between the noise source and receptor, and the presence or absence of noise barriers, including topographical features that would change as project construction activity

progresses. **Table 5-7** shows representative noise levels for individual pieces of construction equipment on site. Potential significant construction impacts were evaluated using the following criteria:

- Construction noise emanating from construction activities for which a Grading or Building Permit is required is prohibited on Sundays and federal holidays, and is exempt from the Placer County Noise Ordinance during the hours of:
  - a) Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings)
  - b) Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time)
  - c) Saturdays, 8:00 a.m. to 6:00 p.m.

Provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

**Table 5-7  
Noise Levels of Representative Construction Equipment Noise**

Type of Equipment	Assumed Maximum Noise Level at 50 feet for One Piece of Construction Equipment (dBA)
Backhoe	78
Compactor	83
Compressor (air)	78
Concrete Saw	90
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Pneumatic Tools	85

Source: FWHA, 2006.

### Operation

Noise impacts from operation would result from the redistribution of traffic within the *Community Plan* area. The magnitude of impact would depend on the amount of traffic redistribution at any one location. Potential significant operational impacts were evaluated using the following criteria:

- Proposed project activities would generate a substantial noise level increase in average daily sound levels at noise-sensitive receptors; for the purposes of this Focused Draft EIR, an increase of 4 dB or more would be considered significant.

### 5.3.2 Methodology

To assess noise impacts due to the proposed project, j.c. brennan & associates, Inc. modeled the traffic patterns/volumes, roadway speeds, and roadway average daily traffic (ADT) volumes for the proposed project. Traffic noise levels were modeled using the Federal Highway Administration Highway Traffic

Noise Prediction Model (FHWA-RD-77-108) to predict project traffic noise levels at a reference distance of 100 feet from the project-area roadway centerlines. **Appendix F** provides the complete inputs and results to the FHWA model. Traffic inputs to the model were obtained from the *Dry Creek West Placer Community Plan: Transportation Element Update Traffic Study* (January 28, 2009) and subsequent *Alternative 5 Results for the Dry Creek/West Placer Community Plan – Transportation Element Update* (June 22, 2009). The modeled noise levels account for the proposed speed reduction treatments, where such treatments and estimated speeds were available.

Because detailed improvement plans are not available at this time, this analysis assumes that the roadway improvements under the proposed project will generally occur within the existing roadway alignments and that vertical and horizontal geometrics will remain similar to existing roadway geometrics. Significant variations in roadway geometrics could cause increases in noise levels not anticipated in this analysis.

### 5.3.3 Impacts

#### 5.3.3.1 Construction Impacts

<b>IMPACT 5-1:</b>	Grading and construction activities associated with the proposed project would intermittently and temporarily generate noise levels above ambient background levels in the project area.
<b>SIGNIFICANCE:</b>	Short Term: Potentially Significant Long Term: Not Applicable
<b>MITIGATION:</b>	Mitigation Measure 5-1a
<b>Proposed:</b>	Mitigation Measure 5-1a
<b>Significance After Proposed Mitigation:</b>	Short Term: Less-than-Significant Long Term: Not Applicable
<b>Recommended:</b>	None
<b>RESIDUAL SIGNIFICANCE:</b>	Short Term: Less-than-Significant Long Term: Not Applicable

Construction activities associated with the proposed project would result in temporary noise increases at nearby sensitive receptors. Impacts to sensitive receptors resulting from the proposed project would depend on several factors, such as the type of project for the given area, land use of the given area, and duration of proposed construction activities. Additionally, construction noise levels would fluctuate depending on the construction phase, equipment type, and duration of the use; distance between the noise source and receptor; and the presence or absence of barriers between the noise source and receptor.

The proposed project would require grading and construction activities that would intermittently and temporarily generate noise levels above ambient background levels. Noise levels in the immediate vicinity of the construction sites could increase, sometimes for extended durations.

Activities involved in construction would generate maximum noise levels, as indicated in **Table 5-7**, ranging from 76 to 90 dB at a distance of 50 feet. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours.

Noise is also generated during construction by increased truck traffic on area roadways. A significant project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration, and would

likely occur primarily during daytime hours. Noise impacts during construction could potentially be significant.

**Mitigation Measure 5-1a** requires the development and implementation of a construction noise abatement program. The program will include, but is not limited to utilization of equipment and trucks that have best available noise control (mufflers, intake silencers, ducts, engine enclosures, and acoustical shields); utilization of hydraulically or electrical powered impact equipment (e.g., jack hammers, pavement breakers, and rock drills); and other specific measures as they are deemed appropriate by the implementing agency to maintain consistency with adopted policies and regulations regarding noise. With implementation of this mitigation measure, construction noise impacts would be less-than-significant.



<b>IMPACT 5-2:</b>	Grading and construction activities associated with the proposed project would intermittently and temporarily generate vibrations above ambient background levels. Vibration levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended durations.
<b>SIGNIFICANCE:</b>	Short Term: Less-than-Significant Long Term: Not Applicable
<b>MITIGATION:</b>	None Warranted

Construction activities associated with the proposed project would result in temporary vibration increases at nearby sensitive receptors. Impacts to sensitive receptors resulting from the proposed project would depend on several factors, such as the type of project for the given area, land use of the given area, and duration of proposed construction activities. Additionally, construction vibration levels would fluctuate depending on the construction phase, equipment type, and duration of the use; distance between the noise source and receptor; and the ground conditions between the vibration source and receptor.

The proposed project would require grading and construction activities that would intermittently and temporarily generate vibration levels above ambient background levels. Vibration levels in the immediate vicinity of the construction sites could increase.

The County does not have specific policies in place regarding limits on construction vibrations at sensitive receptors. However, thresholds for typical levels of human annoyance and damage to structures have been studied and are provided in **Table 5-6** of this report.

Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. **Table 5-8** shows the typical vibration levels produced by construction equipment.

**Table 5-8** data indicate that construction vibration levels are generally less than the 0.200 in/sec ppv threshold of human annoyance and architectural damage at distances of 25 feet. For vibratory compacting/rolling equipment, slightly greater distances would be required to avoid the 0.200 in/sec ppv threshold. Generally, a distance of 30 feet would be sufficient to achieve compliance with the threshold. Because structures are set back 30 feet or more from the edge of pavement at the locations where construction would occur, vibrations from construction equipment would be less-than-significant.



### 5.3.3.2 Operation Impacts

<b>IMPACT 5-3:</b>	Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels or substantial increases in noise as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from roadway extensions, addition of through lanes, modification of existing alignments, etc.)
<b>SIGNIFICANCE:</b>	Significant and Unavoidable
<b>MITIGATION:</b>	Mitigation Measure 5-3a
<b>Proposed:</b>	Mitigation Measure 5-3a
<b>Significance After Proposed Mitigation:</b>	Significant and Unavoidable
<b>Recommended:</b>	None Available
<b>RESIDUAL SIGNIFICANCE:</b>	Significant and Unavoidable

**Table 5-8  
Vibration Levels of Representative Construction Equipment**

Type of Equipment	Peak Particle Velocity @ 25 feet (inches/second)	Distance to 0.200 Peak Particle Velocity Contour (feet)	Approximate Velocity Level @ 25 feet (VdB)
Large bulldozer	0.089	Less than 30 feet	87
Loaded trucks	0.076		86
Small bulldozer	0.003		58
Auger/drill rigs	0.089		87
Jackhammer	0.035		79
Vibratory hammer	0.070		85
Vibratory compactor/roller	0.210		94
Threshold of architectural damage to buildings and annoyance to people in building	0.200		NA

**Source:** Federal Transit Administration, 2006; Caltrans, 2002.

As shown in **Table 5-9**, implementation of the proposed project is predicted to result in both increases and decreases in traffic noise levels in the *Community Plan* area due to changes in overall traffic volumes and segment speeds due to the speed reduction treatments. The proposed project would result in increases in traffic noise levels ranging between 0.1 to 15.7 dBA  $L_{dn}$ , while decreases in traffic noise levels are predicted to range between -0.2 and -4.9 dBA  $L_{dn}$ . The largest increases in traffic noise are predicted on PFE Road from Pinehurst to Cook-Riolo Road at 15.7 dBA  $L_{dn}$ . The increase at this location on PFE Road is considered to be significant under the 4 dB threshold of significance described above.

The noise increase on PFE Road is predicted as a result of PFE Road not being closed at Cook-Riolo Road, as planned in the existing *Community Plan – Transportation Element*. The increase in noise levels would affect approximately 17 single-family residential uses immediately adjacent to PFE Road, two of which are shielded by existing sound walls.

**Mitigation Measure 5-3a** is identified to reduce noise impacts at this location. However, even with the policy and regulatory controls for noise-related impacts in place in the *Community Plan* area, it is not certain that this mitigation measure would reduce impacts to a less-than-significant level. Because of this, and because subsequent improvement projects may result in an increase in ambient noise levels, as indicated by the data in **Table 5-9**, this increase in traffic noise levels would remain *significant and unavoidable*.

## 5.4 MITIGATION MEASURES

This section discusses mitigation measures proposed to reduce project-related impacts to noise. During project-level environmental review, these mitigation measures may be augmented or revised based on more detailed project information.

### **Mitigation Measure 5-1a: Develop and Implement a Construction Noise Abatement Program Prior to Construction**

Prior to construction plan approval, the construction contractor will develop and implement a construction noise abatement program conforming to Minute Order 98-08, and the following additional items:

- All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers;
- Stockpiling and/or vehicle staging areas shall be identified on the improvement plans and shall be located as far as is practical from existing occupied dwellings;
- Construction noise emanating from any construction activities for which a Grading or Building Permit is required is prohibited on Sundays and federal holidays, and shall only occur during the following times:
  - Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings)
  - Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time)
  - Saturdays, 8:00 a.m. to 6:00 p.m.

### **Mitigation Measure 5-3a: Reduce Noise Levels Along PFE Road**

To reduce the predicted 15.7 dB increase in traffic noise levels along PFE Road between Pinehurst and Cook-Riolo Road, the County shall consider various noise reduction measures. Noise reduction measures could consist of sound walls, landscaped berms, and/or Open Graded Asphalt Concrete (OGAC) pavements. However, the use of sound walls or landscaped berms along PFE Road may not be feasible at various locations along this roadway due to driveway openings and/or right-of-way constraints. The use of OGAC pavement during road widening or repaving projects could be a practical alternative to noise barriers and has been shown to provide a long-term 3- to 5-dB reduction in noise levels. While this noise reduction measure would not reduce the impact to a less-than-significant status, it would help to reduce the impact.

**Table 5-9  
Predicted Cumulative No Project Alternative and Proposed Project Traffic Noise Levels**

Roadway	Segment	Distance <sup>a</sup> (feet)	Cumulative Traffic Noise Levels (dBA, L <sub>dn</sub> )			Distance to Traffic Noise Contours, L <sub>dn</sub> Cumulative No Project (in feet)			Distance to Traffic Noise Contours, L <sub>dn</sub> Cumulative Proposed Project (in feet)		
			No Project	Proposed Project	Change	70 dB	65 dB	60 dB	70 dB	65 dB	60 dB
Baseline Road	Locust to Watt	100	72.7	72.6	-0.1	151	326	702	150	323	695
Baseline Road	Watt to Walerga	100	72.7	72.5	-0.2	152	327	704	146	314	676
Baseline Road	Walerga to Cook-Riolo	100	70.4	70.3	-0.1	107	231	497	104	225	485
Baseline Road	Cook-Riolo to Brady	100	69.6	69.0	-0.6	93	201	434	85	184	397
Baseline Road	Brady to Foothills	100	69.6	69.0	-0.6	93	201	434	85	184	397
Vineyard Road	West of Cook-Riolo	100	63.7	62.4	-1.3	38	82	177	31	68	145
Vineyard Road	Cook-Riolo to Brady	100	65.3	65.4	0.1	49	105	226	50	107	230
Vineyard Road	Brady to Foothills	100	65.3	65.4	0.1	49	105	226	50	107	230
PFE Road	Watt to Walerga	100	65.1	64.3	-0.8	47	102	220	41	89	192
PFE Road	Walerga to Pinehurst	100	65.0	60.1	-4.9	46	100	215	22	47	101
PFE Road	Pinehurst to Cook-Riolo	100	47.8	63.5	<b>15.7</b>	3	7	15	37	80	172
PFE Road	Cook-Riolo to N. Antelope	100	65.5	65.6	0.1	50	108	232	51	110	238
PFE/Atkinson Road	East of N. Antelope	100	67.6	67.9	0.3	69	149	322	72	155	334
Cirby Way	Foothills to Riverside	100	71.5	71.5	0.0	127	273	588	126	272	586
Cirby Way	East of Riverside	100	69.3	69.3	0.0	90	194	417	90	194	419
Watt Avenue	Baseline to PFE	100	71.2	70.9	-0.3	120	258	556	115	247	532
Watt Avenue	PFE to Elverta	100	71.1	71.1	0.0	119	255	550	118	255	548
Fiddymont Road	North of Baseline	100	69.9	70.0	0.1	98	211	455	101	217	467
Walerga Road	Baseline to PFE	100	69.5	70.3	0.8	93	200	432	105	225	486
Woodcreek Oaks	North of Baseline	100	61.8	64.0	2.2	28	61	131	40	86	185
Cook-Riolo Road	Baseline to Vineyard	100	64.1	60.8	-3.3	40	87	187	24	52	113
Cook-Riolo Road	Vineyard to PFE	100	63.1	61.5	-1.6	35	75	161	27	58	126
Brady Lane	Baseline to Vineyard	100	56.0	55.5	-0.5	12	25	54	11	23	50
Foothills Boulevard	Baseline/Main to Vineyard	100	70.2	70.2	0.0	102	221	475	103	221	477
Foothills Boulevard	South of Vineyard	100	71.7	71.6	-0.1	129	278	599	129	277	597

Source: j.c. brennan & associates, 2009

Notes: <sup>a</sup> Distances are measured in feet from the centerline of the roadway.

**Bold** indicated a relative change in traffic noise levels greater than 4 dB.