4.1.8 NOISE CONDITIONS

The USACE does not have adopted noise standards and therefore uses local jurisdictional standards. As such, this noise analysis is based on information from the Ranch Plan Final EIR 589 prepared for the County of Orange Planning and Development Services Division (County of Orange, 2004) hereby incorporated by reference, and the noise ordinances and/or General Plan Noise Elements of the cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano.

4.1.8.1 Background

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud; and 20 dB higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

Because the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Figure 4.1.8-1 provides examples of various noises and their typical A-weighted noise level.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption, and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, thereby dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. A greater distance traveled results in a greater influence and resultant fluctuations of the sound wave. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature, and humidity also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the perceived noise levels.

Noise has been defined as unwanted sound, and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. These criteria are based on such known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses, and annoyance. Each of these potential noise effects on people is briefly discussed in the following narratives.

Hearing loss is not a concern in community noise situations such as residential developments. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Typical neighborhood noise levels, including very noisy airport environs, are not sufficiently loud to cause hearing loss.

Speech interference is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.

Sleep interference is a major noise concern for traffic noise. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.

Physiological responses are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent to which these physiological responses cause harm or are a sign of harm is not known.

Annoyance is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability.

4.1.8.2 Noise Assessment Metrics

The description, analysis, and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. As previously identified, A-Weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics can be divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly over or perhaps a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, which is typically 1 hour or 24 hours for community noise problems.

Several rating scales have been developed for measurement of community noise. These account for (1) the parameters of noise that have been shown to contribute to the effects of noise on man, (2) the variety of noises found in the environment, (3) the variations in noise levels that occur as a person moves through the environment, and (4) noise variations associated with the time of day. The rating scales are designed to account for the known health effects of noise on people described previously. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. Two of the dominate noise scales are the Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL).

LEQ is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. LEQ is the "energy" average noise level during the time period of the sample. LEQ can be measured for any time period, but is typically measured for 1 hour. This 1-hour noise level can also be referred to as the Hourly Noise Level (HNL). It is the energy sum of all the events and background noise levels that occur during that time period.

CNEL (Community Noise Equivalent Level) is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise which occurs during certain sensitive time periods is penalized for occurring at these times. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, while nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were

selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or simply "60 CNEL." Typical noise levels in terms of the CNEL scale for different types of communities are presented in Figure 4.1.8-2.

Ldn, the day-night scale is similar to the CNEL scale except that evening noises are not penalized. It is a measure of the overall noise experienced during an entire day. In the Ldn scale, those noise levels that occur during the night (10 p.m. to 7 a.m.) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day, when sleep is the most probable activity.

L(%) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period. L(%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example since 5 minutes is 25 percent of 20 minutes, L(25) is the noise level that is equal to or exceeded for 5 minutes in a 20-minute measurement period. It is L(%) that is used for most noise ordinance standards. For example, most daytime city, state, and county noise ordinances use a standard of 55 dBA for 30 minutes per hour or an L(50) level of 55 dBA. In other words, the noise ordinance states that no noise level should exceed 55 dBA for more that 50 percent of a given period.

4.1.8.3 SAMP Study Area Noise Standards

The County of Orange Noise Ordinance and General Plan Noise Element contain the County's policies on noise. The County Noise Ordinance applies to noise generated on one property impacting a neighboring property. Specifically, the Noise Ordinance establishes maximum noise levels that may be experienced on a neighboring property as a result of noise generated on/from another property. The Noise Ordinance is part of the County of County Municipal Code (Division 6, Section 4.6.1) and is enforceable throughout all unincorporated portions of the County. The Noise Ordinance requirements cannot be applied to noise generated by vehicles traveling on public roadways, railroads, or aircraft. Federal and state laws preempt control of mobile noise sources on public roads. However, the County's Noise Ordinance can be applied to vehicles traveling on private property (e.g., parking lots or loading docks).

The County of Orange General Plan Noise Element identifies limits on noise levels from transportation noise sources, vehicles on public roadways, railroads, and aircraft. These limits are imposed on all new developments (i.e., new developments must incorporate the measures to ensure that the limits are not exceeded). The County Noise Element specifies outdoor and indoor noise limits for various land uses impacted by transportation noise sources. The noise limits specified in the County's Noise Element are in terms of the Community Noise Equivalent Level (CNEL) for residential uses and LEQ(h) for commercial uses, where (h) is the duration of the specific use in hours. Assuming the standard day-evening-night traffic distribution, CNEL levels are 1.4 dB higher than average daytime LEQ(h).

The County has established exterior noise standards for residential uses, schools, hospitals, and places of worship. For residential uses, the standard is 65 CNEL. For schools, hospitals, and places of worship, the standard is 65 LEQ(h), which is equivalent to 66 CNEL. These standards are applicable only at "outdoor living areas." The County defines "outdoor living areas" to be spaces that are typically used for passive recreational activities or other noise sensitive uses. Such spaces include patio areas, barbecue areas, and spa areas for residential uses. Outdoor areas that are usually not included in the definition for residential areas include front yard areas, driveways, greenbelts, maintenance areas, and storage areas. For hospital uses, "outdoor living areas" include outdoor patient recovery or resting areas. Outdoor areas at

hospitals that are not used for patient activities are not included in this category. For places of worship, areas that have a significant role in services or other noise sensitive activities are considered "outdoor living areas," while areas principally used for short-term social gatherings are not. For schools, areas routinely used for educational purposes that may be adversely impacted by noise are considered "outdoor living areas," while other areas not used for education uses such as play yard areas are not considered "outdoor living areas."

Table 4.1.8-1 identifies the interior noise standards established by the County. These interior standards are applicable to "habitable rooms," as defined by the County. Closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces are not considered "habitable rooms."

TABLE 4.1.8-1
COUNTY OF ORANGE COUNTY INTERIOR NOISE STANDARDS

Use	Standard
Residential	
All	45 CNEL
Commercial	
Hotel, Motel	45 CNEL
Hospital	45 CNEL
Private Office, Church Sanctuary, College, Preschool, Schools (Grade K-12), Board Room, Conference Room, etc.	45 LEQ(h)[a.] (46 CNEL)[b.]
General Office, Reception Clerical, etc.	50 LEQ(h)[a.] (51 CNEL)[b.]
Other Schools and Colleges	52 LEQ(h)[a.] (53 CNEL)[b.]
Bank Lobby, Retail Store, Restaurant, Typing Pool, etc.	55 LEQ(h)[a.] (56 CNEL[b.])
Manufacturing, Kitchen, Warehousing, etc.	65 LEQ(h)[a.] (66 CNEL)[b.]

a. H=time duration of usage in hours
b. Standard is in terms of LEQ(h). CNEL limit given assumes standard day-evening-night traffic distribution which results in CNEL level being 1.4 dB higher than daytime LEQ(h).

The County Noise Ordinance prescribes exterior and interior noise standards for the protection of residential zoned areas. Table 4.1.8-2 identifies the County's Noise Ordinance standards. The Noise Ordinance is designed to control unnecessary, excessive, and annoying sounds from sources on private property by setting limits that cannot be exceeded at adjacent properties. The Noise Ordinance requirements cannot be applied to mobile noise sources such as heavy trucks when traveling on public roadways. As previously discussed, the control of the mobile noise sources on public roads is preempted by federal and state laws, but does apply to vehicles on private property.

TABLE 4.1.8-2
ORANGE COUNTY NOISE ORDINANCE STANDARDS

Maximum Time of Exposure	Noise Metric	Noise Levels Not To Be Exceeded In Residential Zone	
		7 a.m. to 10 p.m. (daytime)	10 p.m. to 7 a.m. (nighttime)
Exterior Noise Standards			
30 Minutes/Hour	L(50)	55 dBA	50 dBA
15 Minutes/Hour	L(25)	60 dBA	55 dBA
5 Minutes/Hour	L(8.3)	65 dBA	60 dBA
1 Minute/Hour	L(1.7)	70 dBA	65 dBA
Any period of time	L(max)	75 dBA	70 dBA
Interior Noise Standards			
5 Minutes/Hour	L(8.3)	55 dBA	45 dBA
1 Minute/Hour	L(1.7)	60 dBA	50 dBA
Any period of time	L(max)	65 dBA	55 dBA
Source: County of Orange Municipal Code Division 6, Section 4.6.1.			

The County Noise Ordinance specifies dBA noise levels that cannot be exceeded at residential areas for a specified period of time. The time limits are listed in the first column of the table. Column 2 lists the equivalent noise metric in terms of "percent noise level" or L%. The percent noise level describes the noise level that is exceeded during a certain percentage of the measurement period. For example, the L(50) noise level is the level exceeded 50 percent of the measurement period or 30 minutes in an hour. Columns 3 and 4 list the daytime and nighttime noise levels, for the specified metric, that cannot be exceeded under the Noise Ordinance. Greater noise levels are permitted during the day (7 a.m. to 10 p.m.) as compared to nighttime (10 p.m. to 7 a.m.).

The Noise Ordinance states that the daytime noise level for a noise source measured at an outdoor area of a residential property cannot ever exceed 75 dBA; 70 dBA for more than 1 minute of any hour; 65 dBA for more than 5 minutes of any hour; 60 dBA for more than 15 minutes of any hour; or 55 dBA for more than 30 minutes of any hour. Nighttime noise level limits are reduced by 5 dB to reflect the increased sensitivity to noise occurring during this time period. The Noise Ordinance also states that the noise level for a source measured at an indoor area of a residential property cannot ever exceed 65 dBA; 60 dBA for more than 1 minute of any hour; and 55 dBA for more than 5 minutes of any hour. The nighttime interior noise level limits are reduced by 10 dB. The Noise Ordinance contains a clause that, in the event that the ambient noise level exceeds any of the noise limit categories, the cumulative period applicable to that category shall be increased to reflect the ambient noise level. Additionally, the noise level limits are reduced by 5 dB for noise consisting of a pure tone or primarily speech or music to account for increased sensitivity to these sources.

For daytime noise, the County's outdoor standard is more stringent than the interior standard because a typical residence can achieve a 12 dB noise reduction with windows open (i.e., interior noise levels will be at least 12 dB lower than the exterior noise levels with open windows). The Noise Ordinance requires the levels to be 10 dB lower. However, for nighttime noise levels, depending on the characteristics of the noise source, the interior or exterior noise standards may be the most stringent. Additional, the Noise Ordinance exempts noise generated by construction from the ordinance standards during the hours between 7 a.m. and 8 p.m. on weekdays and Saturdays; this exemption does not include Sundays or holidays.

City of Dana Point

The City of Dana Point General Plan Noise Element (July 9, 1991) notes that the major sources of noise include freeways, railroads, major and minor arterial roadways, and significant noise-generating stationary sources, generally grouped as transportation sources (primarily traffic) and non-transportation sources. The most significant and common source of noise is transportation-related noise.

Table 4.1.8-3 identifies the noise standards for various land uses in the City. The most effective method of controlling construction noise is through local control of construction hours. The City of Dana Point Noise Ordinance identifies that grading and equipment operations within one-half mile of a structure for human occupancy shall not be conducted between the hours of 5:00 p.m. and 7:00 a.m. nor on Saturdays, Sundays, and City of Dana Point recognized holidays. However, construction activities occurring at other times are exempt from the noise ordinance threshold in accordance with Chapter 11.10.014 of the Dana Point Municipal Code. Compliance with the noise ordinance is required as a condition of issuance of grading permits. Municipal Code Sections 11.10.010 and 11.10.012 identify the City's exterior and interior noise standards, respectively. The following exterior noise standards apply to any noise that is received on a residential property: between 7 a.m. and 10 p.m., exterior noise levels may not exceed 55 dB(A) and between 10 p.m. and 7 a.m., exterior noise levels cannot exceed 50 db(A). The following interior noise standards are identified in the Municipal Code: between 7 a.m. and 10 p.m., noise levels shall not exceed 55 dB(A) and between 10 p.m. and 7 a.m., they shall not exceed 45 db(A).

TABLE 4.1.8-3
CITY OF DANA POINT NOISE STANDARDS

Land Use Categories		CNEL	
Designations	**Uses**	**Interior[a.]**	**Exterior[b.]**
Residential (All)	Single-Family Duplex, Multiple Family, Mobile Home	45[c.]	65
Neighborhood Commercial, Community Commercial, Visitor/Recreation Commercial/Residential, Professional/Administrative, Industrial/Business Park, Recreation/Open Space, Harbor Marine Land	Hotel, Motel, Transient Lodging	45	–
	Commercial Retail, Bank, Restaurant	55	–
	Office Building, Research and Development, Professional Offices, City Office Building	50	–
	Amphitheater, Concert Hall, Auditorium, Meeting Hall	45	–
	Gymnasium (Multipurpose)	50	–
	Sports Club	55	–
	Manufacturing, Warehousing, Wholesale, Utilities	65	–
	Movie Theaters	45	–
Community Facility	Hospital, Schools' classroom	50	65
	Church, Library	45	–
Recreation/Open Space	Parks	–	65

a. Indoor environment excluding: bathrooms, toilets, closets, corridors
b. Outdoor environment limited to: private yard of single-family; multi-family private patio or balcony which is served by a means of exit from inside the dwelling; balconies 6 feet deep or less are exempt; mobile home park; park's picnic area; school's playground.
c. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of UBC.
d. Exterior noise levels should be such that interior noise levels will not exceed 45 CNEL.

Source: City Dana Point Noise Element, July 9, 1991.

City of Laguna Hills

The City of Laguna Hills General Plan notes that existing noise levels for some residential areas within the General Plan study area near I-5 and along major arterials already exceed the City's 65 dBA CNEL1 exterior noise standard, and are expected to remain above the standard in the future. The majority of future noise increases in the City would occur as a result of traffic increases due to growth in surrounding areas. Although the City of Laguna Hills cannot regulate development outside of its corporate boundaries, the City can work with surrounding jurisdictions to minimize future roadway noise resulting from increases in traffic volumes, and can consider noise impacts in the review of development applications within the City of Laguna Hills. Table 4.1.8-4 identifies the noise standards for various land uses within the City of Laguna Hills.

TABLE 4.1.8-4
CITY OF LAGUNA HILLS NOISE STANDARDS

Land Use	Maximum Exterior	Maximum Interior
Rural, Single Family, and Multi-Family Residential	65 dBA CNEL[a.]	45 dBA CNEL[a.]
Schools: Classrooms Playgrounds	 70 dBA L_{eq}	 45 dBA L_{eq}[a.]
Libraries	–	45 dBA L_{eq}
Hospitals/Convalescent Facilities: Sleeping Areas Living Areas Reception, General Office, Clerical	 – 65 dBA CNEL –	 45 dBA CNEL 50 dBA CNEL 50 dBA L_{eq}
Hotels/Motels: Sleeping Areas Reception, General Office, Clerical	 – –	 45 dBA CNEL 50 dBA L_{eq}
Places of Worship	65 dBA L_{eq}	45 dBA L_{eq}
Open Space/Recreation: Wildlife Habitat Quiet, Passive Areas Active Recreation Areas	 60 dBA CNEL 65 dBA L_{eq} 70 dBA L_{eq}	 – – –
Commercial and Business Park Private Office General Office Restaurant, Retail Store, etc. Warehousing	— — — —	45 dBA L_{eq} 50 dBA L_{eq} 55 dBA L_{eq} 65 dBA L_{eq}
a. CNEL and L_{eq} noise rating scales are described in the Laguna Hills General Plan Master EIR Source: LSA Associates, 1993		

City of Laguna Niguel

The City of Laguna Niguel General Plan Noise Element contains the City's noise policies. The Noise Element of the General Plan presents limits on noise levels from transportation noise sources, vehicles on public roadways, railroads, and aircraft. These limits are imposed on new developments. The new developments must incorporate the measures to ensure that the limits are not exceeded. The City's noise standards for land use compatibility are provided in Table 4.1.8- 5.

TABLE 4.1.8-5
CITY OF LAGUNA NIGUEL NOISE STANDARDS

Land Use	Interior Standard	Exterior Standard
Residential Detached Residential Attached	45	65
Neighborhood Commercial Community Commercial	–	70
Professional Office	50	70
Community Commercial/Professional Office	–	70
Industrial/Business Park	55[a.]	75
Professional Office/Industrial/Business Park Industrial/Business Park/Professional Office/Community Commercial	–	75
Public/Institutional Public Institutional/Professional Office	50	70
Schools	50[b.]	65[b.]
Parks and Recreation	–	70

a. Where quiet is a basis for use.
b. In interior or exterior Classroom Areas during school operating hours.

Source: City Laguna Niguel Noise Element, August 4, 1992.

City of Mission Viejo

The City of Mission Viejo General Plan Noise Element (October 8, 1990) includes interior and exterior noise standards that relate to land use and acceptable noise levels. These standards are provided in Table 4.1.8-6.

TABLE 4.1.8-6
CITY OF MISSION VIEJO NOISE STANDARDS

Land Use Categories		Energy Average CNEL	
Categories	**Uses**	**Interior[a.]**	**Exterior[b.]**
Residential	Single-Family, Duplex, Multiple Family	45[c.]	65
	Mobile Home	–	65[d.]
Commercial Industrial	Hotel, Motel, Transient Lodging	45	65[e.]
Institutional	Hospital, Schools' classroom	45	65
	Church, Library	45	–
Open Space	Parks	–	65

a. Indoor environment excluding: bathrooms, toilets, closets, corridors
b. Outdoor environment limited to: private yard of single-family; multi-family private patio or balcony which is served by a means of exit from inside; mobile home park; hospital patio; park's picnic area; school's playground; hotel and motel recreation area.
c. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided as of Chapter 12, Section 1205 of UBC.
d. Exterior noise levels should be such that interior noise levels will not exceed 45 CNEL.
e. Except those areas affected by aircraft noise.

Source: City Mission Viejo Noise Element, October 8, 1990.

Municipal Code Sections 6.35.040 and 6.35.050 identify the City's exterior and interior noise standards, respectively. The following exterior noise standards apply to any noise that is received on a residential property: between 7 a.m. and 10 p.m., exterior noise levels may not exceed 55 dB(A) and between 10 p.m. and 7 a.m., exterior noise levels cannot exceed 50 db(A). The following interior noise standards are identified in the Municipal Code: between 7 a.m. and 10 p.m., noise levels shall not exceed 55 dB(A) and between 10 p.m. and 7 a.m., they shall not exceed 45 db(A).

City of Rancho Santa Margarita

The City of Rancho Santa Margarita General Plan Noise Element (December 2002) notes that the City has adopted the County of Orange Noise Control Ordinance and noise/land use compatibility requirements. Therefore, the reader should reference the prior description provided for the County of Orange.

City of San Clemente

The City of San Clemente Municipal Code Chapter 8.48, Noise Control, identifies interior and exterior noise standards. With respect to interior noise, the Municipal Code states:

> *It shall be unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level when measured within any other dwelling unit on any residential property, either incorporated or unincorporated, to exceed:*
>
> *A. The interior ambient noise level plus five (5) dB (A) for a cumulative period of more than five (5) minutes in any hour; or*
>
> *B. The interior ambient noise level plus ten (10) dB (A) for a cumulative period of more than one (1) minute in any hour; or*
>
> *C. The interior ambient noise level plus fifteen (15) dB (A) for any period of time.*
>
> *In the event the alleged offensive noise consists of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five (5) dB(A). (Prior code § 16-22.4)*

With respect to exterior noise, the Municipal Code states:

> *It shall be unlawful for any person at any location within the incorporated area of the City to create an noise, or to allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, when the foregoing causes the noise level, when measured by a sound level meter on any other property, to exceed the permitted ambient noise level more than ten (10) minutes per hour. (Prior code § 16-22.3)*

The City's noise standards are identified on Table 4.1.8-7. The maximum permissible ambient *noise* level shall be no greater than the noise levels identified in the table for each of the indicated zones:

TABLE 4.1.8-7
CITY OF SAN CLEMENTE NOISE STANDARDS

	7:00 a.m. - 10:00 p.m.	10:00 p.m. - 7:00 a.m.
Residential		
Exterior	55 dB (A)	50 dB (A)
Interior	50 dB (A)	40 dB (A)
Commercial	65 dB (A)	60 dB (A)
Industrial	70 dB (A)	70 dB (A)

City of San Juan Capistrano

The City of San Juan Capistrano Noise Ordinance identifies exterior and interior noise standards for residential and non-residential land uses. The following exterior noise standards are applicable for residential and institutional districts: between 7 a.m. and 7 p.m., 65 dB(A); between 7 p.m. and 10 p.m., 55 dB(A), and between 10 p.m. and 7 a.m., 45 dB(A). The exterior noise standard for commercial districts is 65 dB(A) at any time during the day. The City's Noise Ordinance further notes that no person at any location within the City, including the industrial and open space districts, shall create any noise, or permit the creation of any noise, which causes the noise level within a residential, public and institutional or commercial district to exceed noise standards noted above for the period of time identified in Table 4.1.8-8.

TABLE 4.1.8-8
CITY OF SAN JUAN CAPISTRANO MAXIMUM NOISE LEVELS NOT TO BE EXCEEDED

Maximum Noise Level Not to be Exceeded During Period of Time	Period of Time
Exterior noise standard plus 20 dB(A)	Any period of time
Exterior noise standard plus 15 dB(A)	Cumulative period of more than 1 minute in any hour
Exterior noise standard plus 10 dB(A)	Cumulative period of more than 5 minutes
Exterior noise standard plus 5 dB(A)	Cumulative period of more than 15 minutes in any hour
Exterior noise standard	Cumulative period of more than 30 minutes in any hour
Source: City of San Juan Capistrano Municipal Code Sec. 93.531.	

4.1.8.4 Noise Measurement Methodology

The noise measurements were taken to determine existing noise levels using a Brüel & Kjær 2236 automated digital noise data acquisition system for short-term (15 minutes) readings. This instrument automatically calculates both the Equivalent Noise Level (LEQ) and Percent Noise Level (L%) for any specific time period. The noise monitor was equipped with a Brüel & Kjær 1/2-inch electric microphone and was calibrated with a Brüel & Kjær calibrator with calibrations traceable to the National Bureau of Standards. Calibration for the instruments is performed annually and is certified through the duration of the measurements. This measurement system satisfies the ANSI (American National Standards Institute) Standards 1.4 for Type 1 precision noise measurement instrumentation.

Existing roadway noise levels, in terms of CNEL, for the roadways anticipated to be affected by RMV Planning Area project-related traffic were calculated for the GPA/ZC EIR 589 using a computation of highway noise. In preparing these computations, the Highway Noise Model published by the Federal Highway Administration (*FHWA Highway Traffic Noise Prediction*

Model, FHWA-RD-77-108, December, 1978) was used. The CALVINO noise emission curves developed by Caltrans were used with the FHWA model because these curves better model the California vehicle mix. The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and adding them together results in the CNEL for the traffic projections used.

4.1.8.5 Existing RMV Planning Area Noise Sources

Ambient noise measurements were taken at five locations: on January 28, 2004 at one location (Site 5) and on March 29, 2004 at four locations (Sites 1 through 4). The locations of the noise measurement sites are depicted in Figure 4.1.8-3. Noise levels were measured for 15 minutes at each location with the exception of Site 5 where a 30-minute measurement was performed. The measurement results are presented in Table 4.1.8-9 in terms of equivalent noise levels (LEQ), maximum noise levels, minimum noise levels, and percentile noise levels (L%). The L(50) percentile level, for example, represents the noise levels exceeded 50 percent of the time, and represents the median ambient noise level. The L(90) noise levels represent the background noise levels that are exceeded 90 percent of the time.

TABLE 4.1.8-9
RMV PLANNING AREA EXISTING NOISE MEASUREMENTS

Site	Start Time	Sound Level (in dBA)					
		LEQ	Lmax	L(10)	L(50)	L(90)	L(min)
1	12:13 p.m.	51	72	44	38	33	29
1[a.]	12.13 p.m.	39	49	43	38	32	29
2	1:08 p.m.	45	54	47	44	41	37
3	1:50 p.m.	42	53	45	41	39	37
4	2:34 p.m.	41	53	44	34	31	30
5	8:16 p.m.	44	56	47	42	38	35

a. Effects of vehicles entering the Northrop Grumman TRW Capistrano Test Site removed.

Source: The Ranch Plan EIR 589.

The noise measurement sites were near the western perimeter of the RMV Planning Area. The measured noise levels show that even at the perimeter of this primarily undeveloped area, noise levels are relatively low. Noise levels further inside and along the eastern perimeter of the RMV Planning Area are likely slightly lower because they are removed from areas of activity. In general, the sources of noise affecting the site consisted of birds, wind blowing through vegetation, and distant traffic, in addition to local sources of noise described below.

Site 1 is located near the current terminus of Avenida Pico off of the entry road to the Northrop Grumman TRW Capistrano Test Site. The primary source of noise affecting the recorded noise levels was six vehicles entering the TRW site. Background noise included bird calls and distant traffic. Table 4.1.8-10 presents the recorded noise levels during the entire measurement period along with an edited version of the measurement that removed the periods when vehicles passed by the site entering the TRW site. The results of the measurements show very low noise levels when the effect of the vehicles is removed. Background sources of noise included bird and distant traffic noise. The average noise level would not be expected to drop much below the

40 dBA level during the daytime. Nighttime noise levels would be lower as wildlife activity ceased along with levels of traffic on roadways in the vicinity of Site 1.

TABLE 4.1.8-10
RMV PLANNING AREA EXISTING ROADWAY TRAFFIC NOISE LEVELS[a.]

Roadway Segment	CNEL at 100 ft.	Distance to CNEL Contour[b.] (feet)		
		70 CNEL	65 CNEL	60 CNEL
I-5				
Avery Parkway to Junipero Serra	80.5	499	1,075	2,315
Junipero Serra to Ortega Highway	80.4	490	1,056	2,275
Ortega Highway to San Juan Creek	80.0	465	1,003	2,160
San Juan Creek to Stonehill	80.0	462	996	2,147
Stonehill to Camino Las Ramblas	79.7	445	958	2,063
Camino Las Ramblas to Camino de Los Mares	80.0	465	1,003	2,160
Camino de Los Mares to Avenida Vista Hermosa	79.8	454	977	2,105
Avenida Vista Hermosa to Avenida Pico	79.5	432	931	2,007
SR-73				
Oso Parkway to Crown Valley Parkway	72.5	147	317	684
Crown Valley Parkway to I-5	72.4	145	313	673
SR-241				
North of Antonio Parkway	69.6	94	204	438
Antonio Parkway to Oso Parkway	66.1	55	119	255
Oso Parkway				
East of I-5	70.7	111	240	517
West of Marguerite Parkway	69.1	88	189	406
Marguerite Parkway to Felipe Road	69.1	88	189	406
Felipe Road to Antonio Parkway	69.1	88	189	406
East of Antonio Parkway	67.8	72	155	333
West of SR-241	67.4	67	144	310
East of SR-241	66.2	56	121	260
Crown Valley Parkway				
West of Marguerite Parkway	69.1	88	189	406
East of Marguerite Parkway	68.9	84	182	392
West of Antonio Parkway	67.0	63	136	294
Junipero Serra				
West of I-5	63.5	RW	80	171
Ortega Highway				
I-5 to Rancho Viejo	72.8	154	332	715
West of La Novia	71.6	128	275	593
East of La Novia	70.7	112	242	521
West of La Pata	69.9	98	212	457
East of New Ortega Highway	65.5	50	108	233
San Juan Creek Road				
West of La Novia	62.0	RW	64	137
East of La Novia	61.1	RW	55	118
Avenida Vista Hermosa				
East of I-5	66.2	56	121	260

TABLE 4.1.8-10 (Continued)
RMV PLANNING AREA EXISTING ROADWAY TRAFFIC NOISE LEVELS[a.]

Roadway Segment	CNEL at 100 ft.	Distance to CNEL Contour[b.] (feet)		
		70 CNEL	65 CNEL	60 CNEL
Avenida Pico				
East of I-5	69.0	86	185	399
West of La Pata	66.8	62	133	286
La Pata to Avenida Vista Hermosa	63.6	RW	81	175
East of Avenida Vista Hermosa	61.0	RW	54	117
Camino Capistrano				
South of Paseo de Colinas	59.0	RW	40	86
North of Junipero Serra	59.0	RW	40	86
Junipero Serra to Roso	62.5	RW	68	146
Antonio Parkway				
North of SR-241	67.8	72	155	333
Empresa to SR-241	67.2	65	140	302
Empresa to Banderas	67.4	67	144	310
Oso Parkway to Crown Valley Parkway	67.8	72	155	333
South of Crown Valley Parkway	65.3	48	104	224
North of New Ortega Highway	64.0	RW	86	185
North of Ortega Highway	64.0	RW	86	185
Avenida La Pata				
South of Ortega Highway	58.0	RW	RW	73
South of Avenida Pico	60.2	RW	48	103
Camino Vera Cruz				
Camino de Los Mares to Vista Hermosa	61.6	RW	59	128
Avenida Talega				
East of Avenida Vista Hermosa	52.0	RW	RW	RW

a. Modeled
b. From roadway centerline
RW: Contour does not extend beyond roadway right-of-way

Source: The Ranch Plan EIR 589

Site 2 is located just beyond the end of San Juan Creek Road. The primary sources of noise at Site 2 were distant traffic and noise generated by activities in the nearby residential areas. The noise environment around Site 2 would be characterized as quiet, with an average noise level of 45 dBA.

Site 3 is located approximately 1,000 feet north of Ortega Highway in the existing agricultural operations. The primary source of noise at Site 3 was truck traffic associated with the agricultural operations. Background noise sources included birds, distant traffic, and distant agricultural operation activities.

Site 4 is located near the SMWD Chiquita Water Reclamation Plant. Noise sources affecting Site 4 included overhead aircraft, birds, and wind through vegetation. No discernable noise from the Water Reclamation Plant was detected. No discernable noise from the Water Reclamation Plant was detected which is reflective of ongoing conditions at the plant. These types of facilities do not generate significant noise levels.

Site 5 is located near the south end of Tesoro High School. Noise experienced at Site 5 included activities at the high school, traffic on Oso Parkway, birds, and distant traffic.

Existing Roadway Noise Levels

The distances to the existing 60, 65, and 70 CNEL contours for selected roadways in the vicinity of the RMV Planning Area are identified in Table 4.1.8-10. The CNEL at 100 feet from the roadway centerline is also presented. These represent the distance from the centerline of the road to the contour value shown. The values represent existing noise levels and do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels. Where the line of sight between an observer and a roadway is blocked by a substantial object (e.g., a berm, block wall, or building), the traffic noise levels are reduced by a minimum of approximately 5 dB.

The roadway segments presented in the table are those that are projected to experience a 0.5 dB or greater traffic noise CNEL increase due to the development of the RMV Planning Area, or are projected to experience a 1.5 dB or greater traffic noise CNEL increase over existing conditions in the future with development of the RMV Planning Area.

The table shows that high traffic noise levels are generated along I-5 and SR-73 (i.e., 72.4 to 80.5 dB CNEL. Considerable noise levels are generated along SR-241, Oso Parkway, Crown Valley Parkway, Ortega Highway, Avenida Pico, and Antonio Parkway (i.e., 61.0 to 72.8 dB CNEL). Moderate noise levels are experienced along Junipero Serra, San Juan Creek, Avenida Vista Hermosa, Camino Capistrano, and Camino Vera Cruz (i.e., 59.0 to 66.2 dB CNEL). Noise levels along Avenida La Pata and Avenida Talega are minor (i.e., 52.0 to 60.2 dB CNEL).

Existing Aircraft Noise Levels

Airport Operations

The RMV Planning Area is not located in the immediate vicinity of any airfield and is not directly impacted by noise generated by any airport operations. Enroute aircraft overfly the RMV Planning Area and are audible at times. However, because of the relatively low aircraft noise levels experienced on the site and the limited time that this occurs, aircraft do not generate noise levels that approach the local cities' and County's noise standards.

On-Site Heliport

A private heliport is located at the Rancho Mission Viejo headquarters within the RMV Planning Area. This heliport is used infrequently, approximately four times a year, for aerial tours of the site or for other Rancho Mission Viejo business. Areas around the heliport are exposed to substantial noise levels as helicopters arrive and depart the heliport. However, because of the infrequency of operations, noise levels in the vicinity of the heliport do not approach the County's noise standards.

U.S. Marine Corps Base at Camp Pendleton (MCB Camp Pendleton)

MCB Camp Pendleton is located along the southern and eastern boundaries of the SAMP Study Area at the southeast corner. MCB Camp Pendleton is one of the busiest Department of Defense installations in the United States. Approximately 40,000 to 45,000 training events are scheduled at the base each year. These events range from small unit training to larger Regimental and Marine Expeditionary Brigade exercises. Nearly 60,000 service members train

at the base each year. Training activities include amphibious landings, use of tracked vehicles, infantry and vehicle maneuvers, artillery and small arms firing, aerial weapons delivery, engineer support operations, logistics support, field combat service support, communications, airlift support for troops and weapons, equipment maintenance, and field medical treatment. In terms of noise generation, the most significant activities are artillery training and aircraft operations.

MCB Camp Pendleton has an airfield where approximately 180 helicopters are based. Its airfield is located near the southern end of the base approximately 16 miles south of the SAMP Study Area. There are no fixed wing aircraft based at MCB Camp Pendleton. However, turbo prop and jet aircraft from MCAS Miramar and other local military facilities use the facility for aerial weapons delivery training and other training. There is a Helicopter Outlying Landing Field located approximately 1.2 miles from the SAMP Study Area boundary that is used for night vision goggle training. Both fixed wing aircraft and helicopters operate throughout the entirety of the base, including the boundaries of the base.

MCB Camp Pendleton has three types of Special Use Airspace that have been authorized and approved by the Federal Aviation Administration for purposes of supporting the military training operations at the Base. The three types are: (1) Restricted Areas, (2) Military Operations Areas, and (3) Controlled Firing Areas. Each has been established and is used for different purposes, but are individually authorized by the Federal Aviation Administration and all are charted on aviation maps used by military and civilian aviators so that there is an awareness of their existence, their dimensions, and their hours of operation by both military and civilian pilots who fly within this area of southern California. The Special Use Airspace provide a safety buffer to civilian aircraft by alerting them of the presence of hazardous military training operations that are occurring on the ground (or water) areas below this airspace. The most restrictive of these three different kinds of Special Use Airspace at MCB Pendleton is the Restricted Area. Restricted Airspace is used to support hazardous training activities in which "live-fire" training activities are occurring (artillery, mortars, air-to-ground delivery of live bombs, rockets, lasers, etc.; all activities that would be hazardous to non-participating civil aircraft). Thus, when activated, Restricted Airspace prevents civil aircraft from entering these airspace areas and over flying these hazardous training activities when such live-fire training operations are ongoing (pers. comm., L. Rannals, August 6, 2004).

Restricted Airspace area R-2503B overlies a portion of Planning Area 8 and extends from the ground surface to an altitude of 15,000 feet above mean sea level. While the area is designated as a Restricted Airspace to support hazardous military training operations, no hazardous training operations occur over Planning Area 8. The designation provides sufficient clearance for aircraft maneuverability and safety buffer for aircraft not involved in the training exercises.

Much of the central portion of MCB Camp Pendleton consists of two Impact Areas that receive live fire from aircraft and ground troops. There are Artillery Firing Areas situated throughout the base from where ordnance is fired into the Impact Areas. There are no Artillery Firing Areas located within 0.5 mile of the SAMP Study Area. Several Arterial Firing Areas are located between 0.5 and 1.0 mile from the RMV Planning Area boundary; many more are located further than 1.0 mile.

A Range Compatible Use Zone (RCUZ) study was prepared for the MCB Camp Pendleton in the early 1990s and approved in 1993. The RCUZ assesses potential impacts, including noise, from the operations at Camp Pendleton MCB. However, Mr. Larry Rannals (Community Plans & Liaison Officer MCB Camp Pendleton) indicated that the 1993 RCUZ referenced operations had changed substantially since the document's preparation. MCB Camp Pendleton is commencing

the update the RCUZ with completion planned for late 2005. Due to current military activities in Iraq, operations at MCB Camp Pendleton are substantially lower than normal. Any noise monitoring performed at this time would not be representative of typical operations (Rannals, personal communication, August 2005).

MCB Camp Pendleton-related noise affecting the SAMP Study Area would be primarily from aircraft and large artillery firings. Generally, these activities do not occur constantly but periodically. However, during larger training exercises, almost constant activity and noise occurs 24 hours per day. These busy periods, lasting from a few days to a couple of weeks, occur several times a year. Noise levels within the SAMP Study Area (e.g., RMV Planning Area) would be dependant on the specific activities conducted and the locations of the activities. Based on historic activities at MCB Camp Pendleton and the base's relation to the RMV Planning Area, noise levels generated by these activities are not expected to exceed the County's CNEL noise criteria for the RMV Planning Area.

Some training activities would generate readily audible noise levels at the southern portion of SAMP Study Area. However, the relative infrequency with which these activities are expected to occur should not result in the exceedance of the applicable CNEL criteria. Note that CNEL is strictly defined as an annual average noise level with the evening and nighttime weightings. It is possible that CNEL levels could approach or even possibly exceed the 65 CNEL residential outdoor noise standard on a daily basis during periods of heavy activity at MCB Camp Pendleton. However, including periods with little or no noise being generated by the base, the CNEL level calculation should result in the CNEL level being below 65 CNEL.