Appendix G: Noise Assessment

Giroux & Associates
Environmental Consultants

NOISE IMPACT ANALYSIS

SEPTEMBER RANCH SUBDIVISION

CARMEL VALLEY, CALIFORNIA

Prepared for:

Michael Brandman Associates
Attn: Kara Palm
2000 Crow Canyon Place, Suite 415
San Ramon, California 94583-1300

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17744 Sky Park Circle, Suite 210, Irvine, California 92614 - Phone (949) 851-8609 - Fax (949) 851-8612

NOISE SETTING

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters which describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The unit of sound pressure ratioed to the faintest sound detectable by a keen human ear is called a decibel (dB). Because sound or noise can vary in intensity by over one million times within the range of human hearing, a logarithmic loudness scale similar to the Richter Scale describing earthquake intensity is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, noise levels at maximum human sensitivity are factored more heavily into sound descriptions in a process called "A-weighting" written as dB(A). Any further reference to decibels written as "dB" in this report should be understood to be A-weighted.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called Leq), or, alternately, as a statistical description of the sound pressure level that is exceeded over some fraction of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, State law requires that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL).

An interior CNEL of 45 dB(A) is mandated by the State of California Noise Insulation Standards (CCR, Title 24, Part 6, Section T25-28) for multiple family dwellings and hotel and motel rooms. A weighted noise exposure of 45 dB CNEL is also the guideline level for single family interiors used in most California jurisdictions. Since normal noise attenuation within residential structures with closed windows is about 20 dB, an exterior noise exposure of 65 dB CNEL is generally the noise land use compatibility guideline for new residential dwellings in California. Because commercial or industrial activities are generally conducted indoors, the exterior noise exposure standard for such less sensitive land uses is less stringent.

Noise exposure standards have been developed by the State of California and recommended for inclusion into the Noise Element of local general plans. Monterey has adopted a modified version of the State guidelines in its Noise Element. Table 1 shows the matrix of noise exposures considered acceptable for various land uses. "Normally Compatible" noise levels for proposed noise-sensitive uses (residential, recreation, etc.) extend up to 70 dB CNEL. Although 70 dB CNEL is considered compatible, County policy is to mitigate exterior exposure in noise-sensitive land uses to 65 dB CNEL, where feasible. In semi-rural environments, an exterior noise level of 60 dB CNEL is considered most desirable in any usable outdoor space.

Table 1

Monterey County Land Use Compatibility for Exterior Community Noise

Land Use Category	Noise Ranges (Ldn or CNEL) dB			
	I	II	III	IV
Passively Used Open Space	50	50-55	55-70	70+
Auditoriums, concert halls, amphitheaters	45-50	50-65	65-70	70+
Residential – low density single-family, duplex, mobile homes	50-60	60-70	70-75	75+
Residential multi-family	50-60	60-70	70-75	75+
Transient lodging – motels, hotels	50-60	60-70	70-80	80+
Schools, libraries, churches, hospitals, nursing homes	50-60	60-70	70-80	80+
Actively used open spaces-playgrounds, neighborhood parks	50-67	-	67-73	73+
Golf courses, riding stables, water recreation, cemeteries	50-70	-	70-80	80+
Office buildings, business commercial and professionals	50-67	67-75	75+	-
Industrial, manufacturing, utilities, agriculture	50-70	70-75	75+	-

Noise Range I: Normally Acceptable. Specific land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Noise Range II: Conditionally Acceptable. New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Noise Range III: Normally Unacceptable. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Noise Range IV: Clearly Unacceptable. New construction or development should generally not be undertaken.

Source: Office of Noise Control, California Department of Health, 1976.

EXISTING NOISE LEVELS

Existing noise levels throughout the vicinity of the proposed project area derive almost exclusively from vehicular sources on Carmel Valley Road. In order to document existing baseline noise standards as a basis for projecting future noise exposure, both from the project to the community and the ambient noise upon the proposed project, an on-site noise measurement was made on January 21, 2003. Noise monitoring was performed using a Larson-Davis Labs Model 700 Dosimeter digital sound meter, Serial No. 3203. Short-term monitoring (1-hour) was performed between 9:00 a.m. and 11:00 a.m. at two locations on/near September Ranch. The monitoring results are shown in Table 2.

Monitoring experience has shown that daytime short-term Leq and weighted 24-hour CNELs are similar with CNEL typically 2 dB higher than Leq. Existing baseline noise levels near the equestrian center are estimated to be near 60 dB CNEL. The planned inclusionary housing will have a setback that is almost identically equal to the equestrian center measurement location. Existing on-site noise levels at the closest proposed residences to Carmel Valley Road are therefore at or below even the most stringent County residential noise and land use standard of 60 dB CNEL. Proposed single-family homes will be even farther from the roadway. Existing baseline noise levels at the single-family sites are well below 60 dB CNEL.

Table 2

Ambient Noise Monitoring Summary
January 21, 2003 (9:00 a.m. to 11:00 a.m.)

	Leq	Lmax	Lmin	L_{10}	L_{50}	L_{90}
Fence behind stock pond[1]	58	66	40	61	57	44
50 feet to centerline[2]	65	77	42	68	62	51

[1]260 feet to Carmel Valley Road centerline, near equestrian center.
[2]At curve in road, moderately shielded field of view.

Traffic counts (vehicle/hour):

	Auto	Medium	Heavy
Stock pond	1,175 (93.6%)	50 (4.0%)	30 (2.4%)
Near roadway	920 (94.8%)	30 (3.1%)	20 (2.1%)
AVERAGE	**1,050 (94.2%)**	**40 (3.5%)**	**25 (2.3%)**

NOISE IMPACTS

Two characteristic noise sources are typically identified with land use intensification such as that planned for the proposed September Ranch subdivision. Initially, construction activities, especially heavy equipment, will create short-term noise increases near the project site. There is considerable setback from anticipated on-site construction and existing off-site residences. Topographical screening will also reduce off-site impact potential. The primary source of construction noise impact would likely occur when a new on-site residence is constructed adjacent to an already completed and occupied home.

Upon completion, project-related traffic will cause an incremental increase in areawide noise levels throughout the Carmel Valley area. Traffic noise impacts are generally analyzed both to insure that the project will not adversely impact the acoustic environment of the surrounding community, as well as to insure that the project site is not exposed to an unacceptable level of noise resulting from the ambient noise environment acting upon the project.

Standards of Significance

Community noise problems typically occur at levels that are well below the threshold for hearing loss. Noise at less than hearing loss levels, however, may nevertheless create a variety of negative effects through loss of sleep, interference with communication or lack of concentration. Noise-induced stress varies from one person to another and varies even within the same person from one day to the next. There are therefore no clear-cut limits that characterize a stress-free noise environment.

Noise impacts would be considered significant if they cause standards to be exceeded where they are currently met, or if they create a measurable increase in noise levels in an already noisy environment. Appendix G of CEQA guidelines list the following noise and/or vibration impacts as potentially significant:

- Levels exceeding standards in general plans or noise ordinances.
- Excessive groundborne vibration or groundborne noise.
- A substantial permanent increase.
- A substantial temporary or periodic increase.
- Exposure of sensitive receptors living or working within two miles of a public airport to excessive noise levels.

There are no public-use airports in the project vicinity that would cause the project site to possibly experience "excessive" noise levels due to airport proximity. Air traffic from general aviation airports is minimal in the project vicinity. No further aircraft noise analysis is provided or necessary.

The terms "substantial" or "excessive" are not defined in most environmental compliance guidelines. Noise level increases are considered substantial or exposures are considered excessive if they violate standards or measurably increase an already loud baseline. The issue of

standards relates to the first significance criterion above. The issue of a "substantial permanent increase" is less clearly defined.

Noise analysis methodology is accurate only to the nearest whole decibel, and most people only notice a change in the noise environment when pre- and post-project differences are around 3 dB. Masking effects of existing traffic at any off-site receivers possibly affected by increases in project-related transportation may also minimize project perceptibility. A clearly perceptible (+3 dB) increase in noise exposure of sensitive receivers would be considered significant.

Temporary noise generation will result during construction activities. For projects within Monterey County, the duration and intensity of such noise is regulated by time limits on grading and other heavy equipment operations. Compliance with these limits is generally presumed to create a less-than-significant impact.

Construction Noise Impacts

Construction activities, especially from heavy equipment, may create substantial short-term noise increases near the project site. Such impacts might be important for nearby noise-sensitive receptor such as the existing residential uses. Construction periods will be of short duration, and with limited physical improvements planned for the site. The intensity of construction activities will be no more severe than historic heavy equipment operations on the project site.

The most noise-intensive period will be when scrapers and dozers will be involved in moving quantities of earth and rough grades are established for proposed homes and project infrastructure. Equipment noise will reach 90 dB at 50 feet from such equipment when it operates under full load. Under normal atmospheric spreading losses, peak levels up to 65 dB may be heard as far as 1,000 feet from the operating equipment. A level of 65 dB is considered intrusive in normal conversation. Construction activity impacts during the noisiest activities could thus extend as far as approximately 1,000 feet from the activity. However, irregular terrain will limit the extent of any construction noise envelope to well below its theoretical maximum.

Noise impacts would be significant if they caused a violation of any adopted standards. There are no specific performance standards in the County Code that apply to construction. Such activities are exempt from compliance with numerical noise ordinance standards if the activity occurs during less noise-sensitive hours. Construction noise impacts are thus minimized by time restrictions placed on grading permits. Time limits on construction involving the operation of powered equipment are recommended to extend from 7:00 p.m. to 7:00 a.m. the following morning, and all day on Sundays and holidays. Compliance with these limits is predicted to create a less-than-significant temporary noise impact during construction activities.

Project-Related Vehicular Noise Impacts

The proposed project will add approximately 1,000 vehicle trips to the area-wide roadway system. These trips will be concentrated along Carmel Valley Road, and then gradually disperse to progressively lower volumes farther away from the site. Noise levels are logarithmic. It therefore requires a doubling of daily traffic volumes to raise noise levels by a significant amount (10 * log [2] = +3.0). If a road is already carrying enough traffic to experience elevated

noise, any single project typically does not add enough traffic to cause an individually significant noise impact. Most off-site traffic noise impacts are therefore cumulative in nature.

A project traffic noise impact analysis was conducted by calculating noise levels for various traffic scenarios based upon traffic volumes forecast in the project traffic study. Vehicle mixes and speeds that were observed during on-site monitoring, were used in the noise impact comparison along Carmel Valley Road and SR-1. Lower truck volumes and reduced travel speeds were assumed on residential side streets. This analysis was conducted using the California Specific Vehicle Noise Curves (CALVENO) in the federal roadway noise model (the FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108). The model calculates the Leq noise level for a particular reference set of input conditions, and then makes a series of adjustments for site-specific traffic volumes, distances, speeds, or noise barriers to yield a CNEL estimate.

Table 3 shows the calculated CNEL at a 50-foot reference distance from the centerline of 27 area roadway segments for four scenarios (existing, existing plus project, cumulative without project, and cumulative with project.

None of the roadways within the analysis area will experience individual or cumulative traffic noise increases exceeding +0.2 dB. The largest noise increase directly related to the project of +0.2 dB will occur along Carmel Valley Road near the project site. Increases of +0.2 dB are undetectable even under laboratory conditions-much less in an ambient environment. The proposed project is too limited in scope as to create an individually significant off-site traffic noise impact within the Carmel Valley community.

Cumulatively, several roadways will experience traffic noise level increases exceeding the +3.0 dB significance threshold. The project contribution to these increases is undetectable, however, seen as follows (dB):

	CNEL*		**Increase from:**	
Roadway Segment	**Existing**	**Cum. (With Project)**	**Cum. Grow.**	**Project Only**
SR-1				
Carmel Valley Rd.-Rio Rd.	70.2	73.3	+3.1	0.0
South of Rio Road	67.5	72.3	+4.8	0.0
Carmel Knolls Drive				
N of Carmel Valley Road	54.9	60.1	+5.2	0.0
Rancho San Carlos Rd.				
S of Carmel Valley Rd.	59.8	63.0	+3.2	0.0

*At 50 feet to centerline, residential standard is 65 dB CNEL.

Table 3

Off-site Traffic Noise Impact Analysis (dB)

Segment	Existing CNEL	2025		
		Existing Plus Project	Cumulative No Project	Cumulative With Project
Serra Ave.				
West of SR-1	66.8	66.8	66.3	66.3
Carpenter St.				
East of SR-1	57.2	57.2	57.4	57.4
Ocean Ave.				
West of SR-1	66.0	66.1	68.0	68.0
Carmel Hills Dr.				
East of SR-1	62.0	62.1	63.6	63.6
Rio Road				
West of SR-1	66.3	66.3	67.1	67.1
East of SR-1	68.1	68.2	68.8	68.8
Carmel Valley Road				
SR-1-Carmel Knolls Dr.	72.9	73.0	73.8	73.9
East of Carmel Knolls	73.3	73.5	74.4	74.5
West of Rancho San Carlos	71.8	71.9	72.8	72.9
Rancho San Carlos-Canada Way	71.4	71.6	72.2	72.4
Canada Way-Brookdale Dr.	71.4	71.6	72.1	72.3
East of Brookdale Dr.	71.4	71.5	72.1	72.2
West of Dorris Dr.	70.5	70.6	71.4	71.4
East of Dorris Dr.	69.6	69.7	70.5	70.6
West of Laureles Grade	68.8	68.8	69.8	69.9
East of Laureles Grade	68.6	68.7	69.9	69.9

Table 3
(continued)

Segment	Existing CNEL	2025		
		Existing Plus Project	Cumulative No Project	Cumulative With Project
SR-1				
North of Carpenter St.	76.2	76.2	77.4	77.4
Carpenter-Carmel Hills Dr.	74.9	74.9	76.4	76.4
Carmel Hills Dr.-Carmel Valley Rd.	74.6	74.7	75.9	75.9
Carmel Valley Rd.-Rio Rd.	70.2	70.2	73.3	73.3
South of Rio Rd.	67.5	67.6	72.3	72.3
Carmel Knolls Dr.				
North of Carmel Valley Rd.	54.9	54.9	60.1	60.1
Carmel Rancho Blvd.				
South of Carmel Valley Rd.	68.0	68.0	68.7	68.8
Rancho San Carlos				
South of Carmel Valley Rd.	59.8	59.8	63.0	63.0
Brookdale Dr.				
South of Carmel Valley Rd.	48.0	48.0	48.0	48.0
Dorris Dr.				
South of Carmel Valley Rd.	61.9	62.0	62.4	62.5
Laureles Grade				
North of Carmel Valley Rd.	62.3	62.5	64.8	64.9

*At 50 feet from each roadway centerline.

The entire cumulative noise increase will be from non-project growth. Cumulative impacts are considered less-than-significant.

Along the project frontage at Carmel Valley road, the reference noise level will be 72.4 dB CNEL at 50 feet from the centerline under build-out traffic conditions. Under a direct line-of-sight (180-degree roadway view), the distance to the 65 dB CNEL (acceptable exterior) and 60 dB CNEL (most desirable exterior) are as follows for acoustically "soft" propagation conditions.

65 dB CNEL distance =	155 feet to centerline
60 dB CNEL distance =	335 feet to centerline

The distance to the inclusionary housing is 250 feet. The distance from the nearest single-family building pad (Lots 60 or 64) to the centerline is over 700 feet. All single-family residential lots will have future noise levels of less than 60 dB CNEL. Any residential noise mitigation would focus only on the inclusionary housing.

The southernmost units of this project component would have exterior noise exposures in the 60-65 dB CNEL range. A level within this range would be less than optimal, but within acceptable levels Any balconies or decks facing Carmel Valley Road should be equipped with noise shields if they are included in project design. It would also require window closure facing Carmel Valley Road in order to meet the 45 dB CNEL interior standard. The ability to close windows requires provision of active supplemental ventilation for those rooms with a direct roadway view.

The noise standard for "riding stables" is 70 dB CNEL (See Table 1). The 70 dB CNEL contour will be 72 feet from the Carmel Valley Road centerline at build-out conditions. No equestrian facilities are proposed within 72 feet of the roadway centerline that would be traffic noise impacted.

MITIGATION

The following noise mitigation measures are required to maintain a less-than-significant impact:

1. Construction activities shall be restricted to the hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday.

2. The southern façade of the inclusionary housing units shall have no balconies or decks facing Carmel Valley Road unless the perimeter of such decks is shielded by a 5-foot high glass or transparent plastic barrier.

3. Habitable rooms facing south of the inclusionary housing shall have a source of supplemental ventilation to allow for window closure in such rooms to shut out roadway noise.