APPENDIX F

NOISE
BACKGROUND INFORMATION

Nipomo Community Park Master Plan EIR
Nipomo, California

Noise Study Report

Prepared for:

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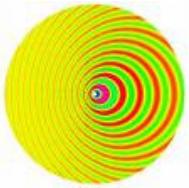

Karl Mikel, PE

November 25, 2010

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I. INTRODUCTION

An outdoor noise assessment has been conducted for the Nipomo Park Master Plan Environmental Impact Report (EIR), in the community of Nipomo, CA (refer to Figure 1). Karl Mikel, PE, and approved County of San Luis Obispo acoustical noise consultant has prepared this report at the request of Ms. Shawna Scott of SWCA Environmental Consultants (SWCA). The project site is located in a semi-urban area of Nipomo, adjacent land uses consist of undeveloped lots, commercial, residential, and a school (Dana Elementary). This report has been prepared in support of the EIR for the proposed project to address the future noise environment of the area resulting from development of the proposed NCP facilities. Specifically this report presents collected noise measurements from similar proposed park facilities (i.e., local skate park, soccer field, etc.) to estimate stationary noise levels expected by the proposed project. This analysis includes noise data generated from existing peak-hour traffic on Tefft Street, Orchard Road, Pomeroy Road, Juniper Street, Camino Caballo, and Osage Street at potentially affected locations to compare to future noise levels due to project generated traffic. This acoustical analysis is required to determine if proposed facilities development would impact surrounding sensitive noise receptors (residential) located in close proximity to the NCP.

II. APPLICABLE NOISE STANDARDS

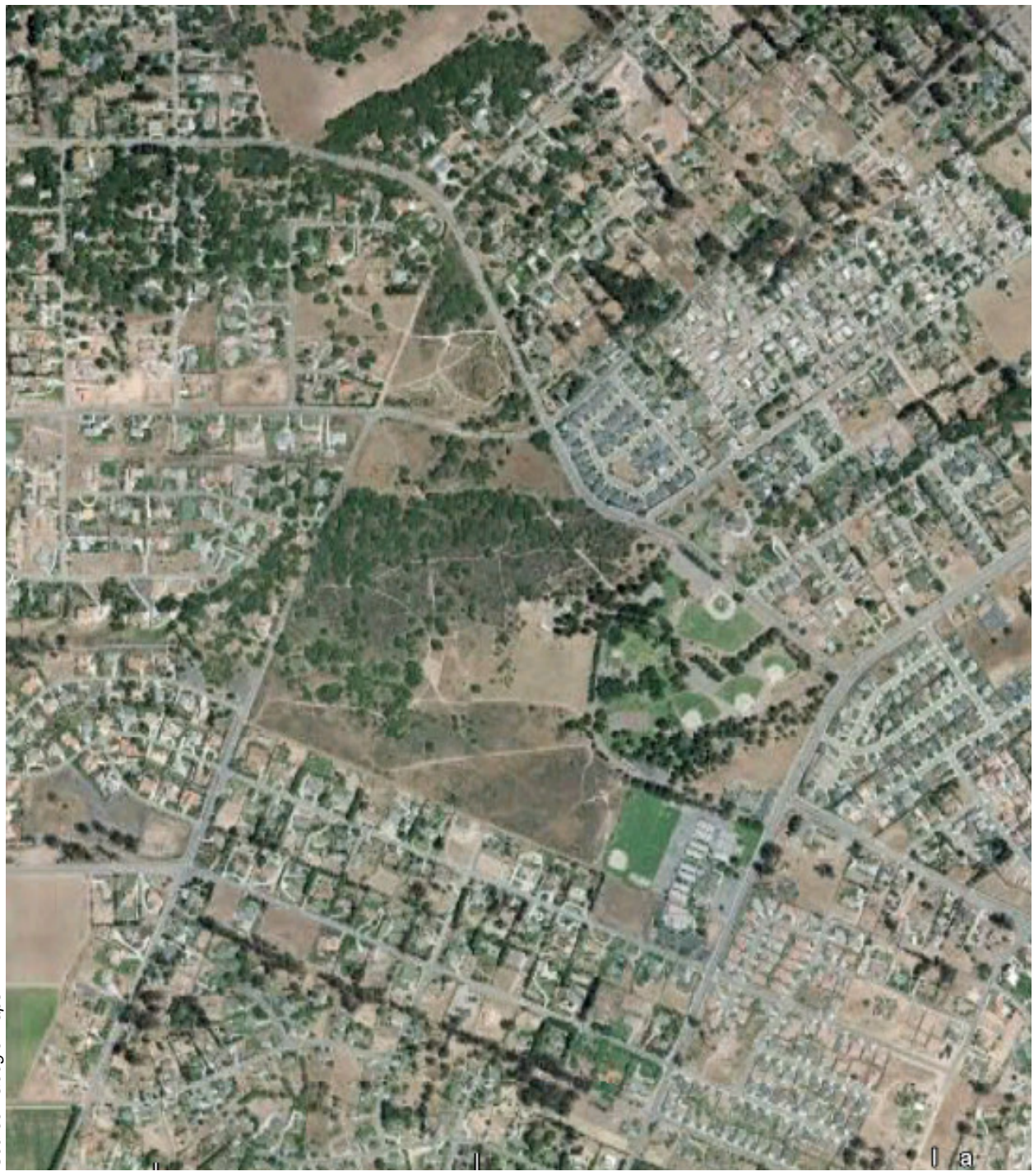
The County of San Luis Obispo Noise Element of the General Plan provides a policy framework for addressing potential and existing noise impacts during the planning process. Its purpose is to minimize future and existing noise conflicts. Among the most significant polices found in the Noise Element are numerical noise standards that limit noise exposure within noise-sensitive land uses resulting from transportation sources. An increase in the ambient stationary noise level surrounding the project site would result from the addition of the new facility, which could potentially result in a stationary noise impact that would exceed the thresholds defined in the County Noise Element.

A. TRANSPORTATION NOISE SOURCES

Policy 3.3.2 of the Noise Element states that "new development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected future levels of noise from transportation noise sources which exceed 60 dB Ldn or CNEL for outdoor activity areas and 45 Ldn or CNEL for interior spaces unless the project includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to or below the levels for the given land use," (refer to Tables 1 and 2).

Policy 3.3.3 of the Noise Element states that "Noise created by new transportation noise sources, including roadway improvement project, shall be mitigated so as not to exceed the levels specified in Table 1 within the outdoor activity areas and interior spaces of existing noise sensitive land uses.

Figure 1: Nipomo Regional Park



Source: Google Maps

TABLE 1
Maximum Allowable Noise Exposure-Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces L_{dn}/CNEL, dB	Interior Spaces L_{EQ}, dB[2]
Residential (Except Temporary)	60 [3]	45	–
Bed and Breakfast, Hotels, Motels	60 [3]	45	–
Hospitals, Nursing and Personal Care	60 [3]	45	–
Public Assembly and Entertainment	–	–	35
Offices	60 [3]	–	45
Churches, Meeting Halls	–	–	45
Schools, Libraries, Museums	–	–	45
Outdoor Sports and Recreation	70	–	–

Notes:
1. 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.
2. As determined for a typical worst-case hour during periods of use.
3. For other than residential uses, where an outdoor activity area is not proposed, the standard shall not apply. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed.

Source: Noise Element, County of San Luis Obispo, General Plan

TABLE 2
Land Use Compatibility For New Development Near Transportation Sources

Land Use	Exterior Noise Exposure, Ldn or CNEL (dB) 55	60	65	70	75	80
Residential, Public Assembly, Entertainment						
Bed and Breakfast, Hotel, Motel						
Schools, Libraries, Museums, Hospitals						
Outdoor Sports and Recreation						
Offices						

Acceptable, no mitigation required
Conditionally Acceptable, Mitigation required
Unacceptable, mitigation may not be feasible

Source: SLO County Noise Element, Policy Document

B. STATIONARY NOISE SOURCES

Policy 3.3.4 of the Noise Element states that "new development of noise-sensitive land uses shall not be permitted where the noise level due to existing stationary noise sources would exceed the noise level standards included in the Noise Element unless effective noise mitigation measures have been incorporated into the design of the development to reduce noise exposure to or below the levels specified." The hourly daytime stationary noise standard for a residential development is 50 dBA, while the maximum is 70 dBA. The hourly nighttime stationary noise standard for a residential development is 45 dBA, while the maximum is 60 dBA (refer to Table 3).

TABLE 3
Maximum Allowable Noise Exposure-Stationary Noise Sources[1]

Level	Daytime (7 a.m. to 9 p.m.)	Nighttime (9 p.m. to 7 a.m.)
Hourly Leq, dBA[2]	50	45
Maximum Level, dBA[2]	70	60
Maximum Level, Impulsive Noise dBA[3]	65	60
Notes: 1. As determined at the property line of the of the receiving land use. 2. Sound level measurements shall be made with slow meter response. 3. Sound level measurements shall be made with fast meter response.		
Source: SLO County Noise Element, Policy Document		

Policy 3.3.5 of the Noise Element states that "new proposed stationary noise sources or existing stationary noise sources that undergo modifications that may increase noise levels shall be mitigated as follows and shall be the responsibility of the developer of the stationary noise source. Policy 3.3.5 can be found in its entirety on page 3-3 of the County Noise Element, applicable standards from Policy 3.3.5 are provided below as follows:

b) Noise levels shall be reduced to or below the noise level standards in Table 3-2 (refer to Table 1 in this report) where the stationary noise source will expose an **existing** noise-sensitive land use (which is listed in the Land Use Element as an allowable use within its existing land use category) to noise levels that exceed the standards in Table 3-2.

c) Noise levels shall be reduced to or below the noise level standards in Table 3-2 where the stationary noise source will expose **vacant** land in the Agriculture, Rural Lands, Residential Rural, Residential Suburban, Residential Single Family, Residential Multi-Family, Recreation, Office and Professional, and Commercial Retail land use categories to noise levels that exceed the standards in Table 3-2.

Note: This policy may be waived when the Director of Planning and Building determines that such vacant land is not likely to be developed with a noise sensitive land-use.

III. STUDY METHOD

A. STATIONARY NOISE ASSESSMENT

The procedure used to assess noise resulting from this project focused on measuring noise levels at similar events and facilities such as soccer games at multi-use sports fields and skate parks to estimate noise levels that could be expected by these types of uses at the NCP. Ambient pre-project noise levels are measured at select locations to determine if recreational development would result in a stationary noise impact. The expected noise levels are then compared to published threshold values in the County's Noise Element to determine if a significant change in the noise environment would occur and if an exceedance of the threshold value would be expected. The one-hour Leq threshold outlined in the Noise Element is 50 dBA at the property line of the nearest sensitive receptor location, with a maximum noise level of 70 dBA allowed for short periods of time so long as the hourly average is maintained at 50 dBA Leq.

B. TRAFFIC NOISE ASSESSMENT

The procedure for assessing vehicular traffic noise impacts included measuring the peak-hour noise levels at select locations around the NCP while counting the traffic generating the noise during the period of measurement. The measured peak-hour noise levels are then adjusted logarithmically to determine the "future" noise levels by using the estimated traffic volume predictions for various road segments. Logarithms are used because they produce linear correlations, which can then be used to more readily evaluate future noise levels. Generally speaking, doubling the traffic volume will produce a 3 dB increase in the ambient noise environment.

From a practical standpoint, the peak-hour Leq noise level is essentially equivalent to the Ldn noise level (generally yielding results within 1-2 dBA of each other). The Ldn is the standard measure used for evaluating community noise impacts in the County Noise Element. For most situations involving noise originating from vehicular traffic, the peak-hour Leq can be used as the Ldn level in situations where there is little nighttime traffic or significant heavy truck volumes. Peak hour Leq was the methodology used in evaluation of traffic noise impacts for the proposed project. Noise measurements were taken for a duration of 15 minutes at each location. Further analysis is based on the average noise levels (Leq) as discussed in this report.

General guidelines for determining community noise impacts typically include:

- A three-dB change is barely perceptible, and is the minimum most people will notice in most environments.
- A five-dB change is a readily perceptible increase or decrease in sound level.
- A ten-dB increase in sound level is perceived as an approximate doubling of the loudness of the sound and represents a substantial change in loudness.

IV. MEASURED NOISE LEVELS

A. GENERAL INFORMATION

The subject noise investigation was conducted using a Bruel and Kjaer (B & K) Model 2231 precision integrating sound level meter. The meter internally computes a new Leq from the sound pressure level and updates the digital display once each second. The meter was calibrated externally at the beginning of each period of measurement using a B & K Model 4230 acoustic calibrator. In combination, these instruments yield sound level measurements accurate to within 0.1 decibel (dB). All models fulfill standards of relevant sections of IEC (International Electrotechnical Commission) 651 and ANSI (American National Standard) S1.4.1971 for Type 1 (precision) integrating sound level meters. All noise readings were conducted in the A-weighted decibel range. The A-weighting correlates well with how humans hear sounds, de-emphasizing very high and low frequencies.

B. STATIONARY NOISE MEASUEMENTS AT SIMILAR FACILITIES

To help assess expected stationary noise levels resulting from development due to the project, similar noise sources and events were monitored. Noise was measured on November 19, 2010 at the Damon Garcia Sports Complex during a youth soccer tournament, and at the Templeton Skate Park on November 21, 2010 (Figures 2 & 3).

The measurement set conducted at Damon Garcia consisted of a multi-game youth soccer tournament. Three games were being played at the same time, measurement Location 3 was the combination of all three games being played at once. There was no amplified sound at any of the games; most of the noise measured from the games resulted from the crowd cheering during exciting plays. Very little noise is actually generated by participants or action on the field. Table 4 presents the results of the monitoring conducted during the soccer event.

TABLE 4
Noise Summary, Damon Garcia Sports Complex

Location	Distance from Center of Field (Feet)	Noise Levels (dBA)	
		Leq	Max
1	25	66.5	76.6
2	50	59.1	75.1
3	100	54.0	73.1
4	10	66.4	79.1

Figure 2: Damon Garcia Sports Complex

Noise Measurement Location: Damon Garcia Sports Complex

Figure 3: Templeton Skate Park

Noise Measurement Location: Templeton Skate Park

The skaters primarily generate the skate park noise when they are actively skating within the confines of the concrete at the facility. The noise environment around the park is subject to multiple impulsive types of episodes when the skaters fall off their boards and the boards bang around on the concrete. When the skaters are on their boards and skating through the facility, the sound of the skate wheels and trucks are quite noticeable in close proximity to the park. Table 5 presents the results of the monitoring conducted at the skate park.

TABLE 5
Noise Summary, Templeton Skate Park

Location	Distance from Center of Field (Feet)	Noise Levels (dBA)	
		Leq	Max
1	25	73.5	82.9
2	50	68.4	79.6
3	100	62.2	74.4

C. TRAFFIC NOISE MEASUEMENTS AROUND THE NCP

The level of traffic noise depends on the following three factors: (1) the volume of traffic; (2) the speed of the traffic; and, (3) the number of trucks in the traffic flow. Generally, heavier traffic volumes, higher speeds, and the greater numbers of trucks increase the loudness of traffic noise. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines will also increase the resultant traffic noise levels. Vehicle noise around the NCP is a combination of the noise produced by the engines, exhausts, and tires.

Higher levels of existing noise resulting from automobile and truck traffic characterize the perimeter portions of the existing NCP site, especially adjacent to the West Tefft Street and Pomeroy Road corridors. Although higher levels of noise are found along the existing transportation corridors surrounding the NCP; noise levels rapidly attenuate as one moves towards the interior of the site because of the varying topography and in some locations the presence of dense thick wooded vegetation. A field investigation was conducted on November 23, 2010, noise measurements were conducted from approximately 3:30 PM to 5:45 PM to determine traffic related ambient noise levels around the perimeter and within the proposed NCP site (refer to Figure 4). Each of the short-term sites was measured for a duration of 15 minutes while vehicle volumes were classified. The hourly counts are then normalized from the data generated.

Generally speaking, the loudest traffic noise levels are associated with sites monitored adjacent to West Tefft Street and Pomeroy Road, which are the primary noise sources in the general area. There are a variety of commercial and retail areas to the north and east of the NCP (including Highway 101), which are additional noise generators in the immediate area. Most other areas surrounding the NCP are residential and do not have significant traffic volumes or excessive traffic noise levels. Table 6 presents the results of the sites monitored.

Figure 4: Nipomo Regional Park

Traffic Noise Measurement Locations: Nipomo Regional Park

TABLE 6
Measured Traffic Noise Levels

Location*	Period of Measurement	Noise Levels (dBA)	Traffic Volume, Measured	
		Leq	Number	Vehicles/ Hr
1	3:30-3:45 pm	63.8	228	912
2	4:00-4:15 pm	64.5	240	960
3	4:30–4:45 pm	61.0	150	600
4	5:00–5:15 pm	57.1	118	472
5	5:15–5:30 pm	55.6	70	280
6	5:30–5:45 pm	63.0	195	780

*Refer to Figure 4 for Measurement Locations

V. PROJECT IMPACTS

A. STATIONARY SOURCES

The project area is a mix of hardscaped surfaces, undeveloped fields, commercial/retail uses, and residential development. The topography surrounding the NCP is characterized as a "hard", which means that it would tend to be more reflective than absorptive of sound pressure waves. Hard sites generally do not have absorptive ground surfaces such as soft dirt, grass, or bushes and trees to attenuate noise levels.

Existing vegetation at the NCP consists of annual grassland, scattered herbaceous vegetation, and small clumps of brush and oak woodland habitat. The existing project site would be characterized as a "soft site", meaning that excess attenuation of sound pressure levels would be observed due to the ground cover and vegetation. After project development, more of the site would be hardscaped, decreasing the project areas natural noise attenuation capabilities. When added to the natural geometric spreading of sound pressure waves, this would result in an overall noise drop-off rate of approximately 6.0 dBA/(doubling distance) for a stationary source.

If one were to assume a conservative drop-off rate of 6 dBA per distance doubled, a safe-distance offset could be estimated in order to determine how far way from the nearest sensitive noise receptor location new facilities must be sited. Referring to Table 4, for a hypothetical non-amplified multi-game soccer event, the nearest field would need to be no closer than 200 feet from the closet receptor location to meet County exterior noise thresholds. Referring to Table 5, for a skate park, the active skating area should be no closer than 400 feet from the nearest receptor location. This evaluation is based on average conditions, with no loud music playing, and assumes only the sounds from voices and skateboards.

B. TRAFFIC SOURCES

To determine the traffic noise level increase due to project generated trips, the Traffic Impact Analysis (March 2010) was used in order to determine buildout traffic conditions with the additional NCP Master Plan uses included for future traffic conditions. Expected noise increases resulting from implementation of the NCP Master Plan resulting from additional vehicle trips are presented in Table 7. All estimated noise increases have been rounded to one decimal place.

TABLE 7
Estimated Future Traffic Noise Level Increase

Location*	Baseline Buildout ADT	Buildout Plus Project ADT	Estimated Noise Level Increase (dBA) Leq
1	8,400	8,602	0.1
2	19,200	19,510	0.1
3	9,350	9,564	0.1
4	3,100	3,122	0.0
5	1,300	1,322	0.1
6	6,700	6,764	0.0

*Refer to Figure 4 for Measurement Locations

As seen in Table 7, due to the relatively low number of expected additional trips, estimated noise level increases due to project generated traffic are expected to be negligible. Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA when exposed to steady single-frequency (pure tone) signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dBA (Caltrans Technical Noise Supplement, 2009). Since the expected noise level increase would be less than 1 dBA, traffic noise impacts are not expected to occur due to buildout of the NCP uses.