

Environmental Noise Assessment

# Santa Margarita Quarry Extension Project

San Luis Obispo County, California

BAC Job # 2011-064

Prepared For:

Hanson Aggregates Mid-Pacific

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## Executive Summary

An extensive analysis of potential noise and vibration impacts has been conducted for the proposed Lehigh-Hanson Mid-Pacific Santa Margarita Quarry Extension Project by Bollard Acoustical Consultants, Inc. (BAC), as documented in this report. The key components and conclusions of this noise and vibration analysis are as follows:

- Continuous ambient noise monitoring was conducted at five (5) locations surrounding the project site for a period of seven (7) consecutive days at each location.
- Reference noise levels from each major noise-producing operation or equipment type within the project site was quantified, including the following:
  - Rock Plant (crushers, screen decks, conveyors, hoppers, back-up beepers, etc.)
  - Excavation Equipment (Front-loaders, rock drills, and Bulldozers – including backup warning devices)
  - Off-Road Haul Trucks
  - Water Truck
  - Blasting
- Project noise levels were predicted at nine (9) representative sensitive receptor locations surrounding the project area.
- Noise and vibration impacts were assessed at those representative receptor locations relative to locally adopted noise standards (San Luis Obispo County), and relative to measured existing ambient levels.
- No project noise impacts were identified for any aspect of the project relative to adopted San Luis Obispo County noise standards.
- No adverse vibration impacts were identified for this project.
- Off-site traffic noise impacts for average and peak operating conditions were identified as being less than significant on all project area roadways.

## Introduction

The acoustical consulting firm of Bollard Acoustical Consultants, Inc. (BAC) has been retained by Hanson Aggregates to assess potential noise and vibration impacts associated with the proposed Santa Margarita Quarry Extension Project (Project).

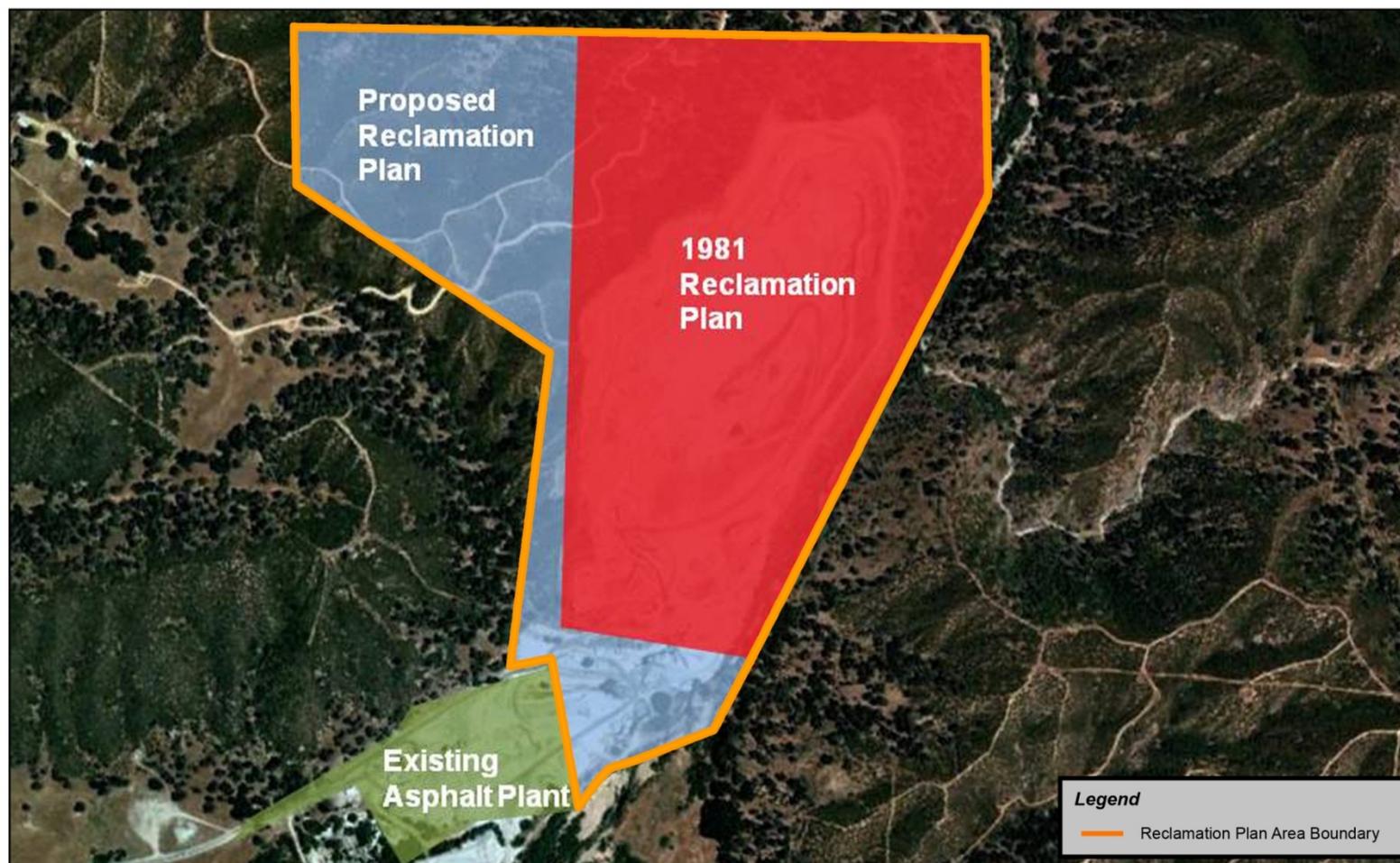
The Santa Margarita Quarry is a hard rock mining operation located northeast of Santa Margarita along the Salinas River in San Luis Obispo County. The Quarry currently comprises approximately 85 acres of operational areas, which consist of surface mining excavations, overburden stockpiling, crushing and processing facilities, access roads, administrative offices and equipment storage. The Quarry also includes other predominantly undisturbed areas, either held in reserve for future mining or which buffer operations from adjacent land uses.

Mining operations take place subject to California's Surface Mining and Reclamation Act (SMARA). SMARA mandates that surface mining operations have an approved reclamation plan that describes how mined lands will be prepared for alternative post-mining uses, and how residual hazards will be addressed. San Luis Obispo County acts as lead agency under SMARA. The County approved the Quarry's current reclamation plan in 1981, covering 85 acres.

The project is a request for amendment to the existing Conditional Use Permit and Reclamation Plan, to extend the quarry operation into adjacent land to the west. The project would enlarge the quarry reserves by an additional 41 acres and the amended Reclamation Plan boundary would cover all areas disturbed by mining activities, a total of 126 acres. The currently entitled mine life is approximately 21 years at average operation levels, and the extension would add approximately 38 years beyond that, at average output. No changes to currently entitled operational limits are proposed, and no increases to traffic would result.

The project vicinity and location of existing and proposed operations are shown on Figure 1.

**Figure 1**  
Santa Margarita Quarry Extension - San Luis Obispo County, California  
Reclamation Plan Area Boundary



Note: Locations of operations shown in this figure are for display purposes and should be considered approximate.

NOT TO SCALE



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## Analysis Objectives

The objectives of this analysis are as follows:

- To provide background information pertaining to the effects of noise and vibration.
- To identify existing noise-sensitive land uses in the immediate project vicinity.
- To describe existing ambient noise and vibration conditions at those nearest sensitive land uses.
- To identify the significance thresholds for project-related noise and vibration impacts based on the California Environmental Quality Act (CEQA) guidelines, local San Luis Obispo County noise standards, and existing noise and vibration conditions.
- To predict project-related noise and vibration levels at the nearest noise-sensitive areas.
- To identify impacts by comparison of project noise and vibration levels against the project standards of significance.
- To evaluate noise and vibration mitigation options where significant project-related impacts are identified.

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## Background on Noise and Vibration

### Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that human hearing can detect. If the pressure variations occur frequently enough (i.e., at least 20 times per second) they can be identified as sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz). Please see Appendix A for definitions of terminology used in this report.

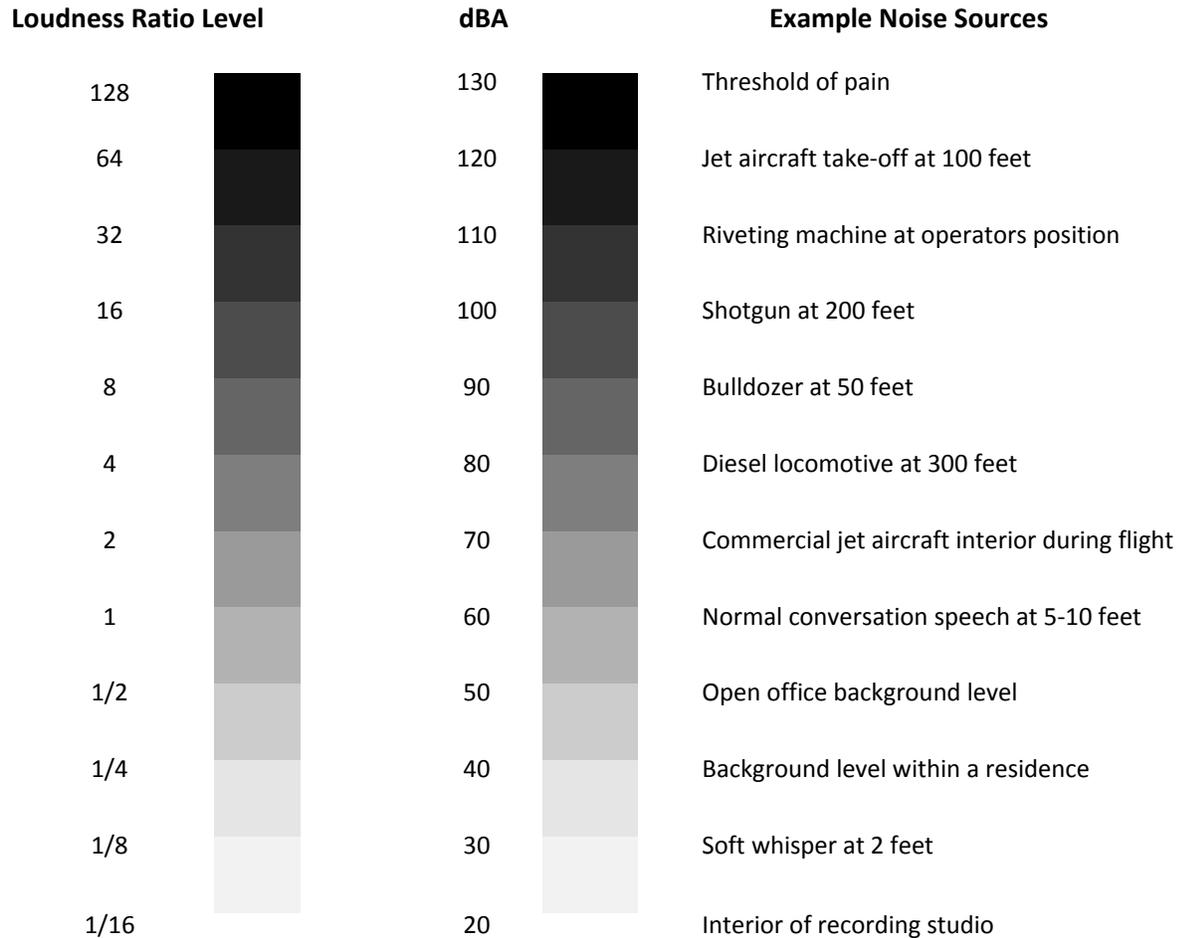
Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale utilizes the hearing threshold (20 micropascals of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers within a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Figure 2 illustrates common noise levels associated with various sources.

The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighting the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. All noise levels reported in this section are A-weighted.

Community noise is commonly described in terms of the “ambient” noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level ( $L_{eq}$ ) over a given time period (usually one hour). The  $L_{eq}$  is the foundation of the Day-Night Average Level noise descriptor,  $L_{dn}$ , and shows very good correlation with community response to noise.

The Day-Night Average Level ( $L_{dn}$ ) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because  $L_{dn}$  represents a 24-hour average, it tends to disguise short-term variations in the noise environment.  $L_{dn}$  based noise standards are commonly used to assess noise impacts associated with traffic, railroad and aircraft noise sources.

**Figure 2**  
**Typical A-Weighted Sound Levels of Common Noise Sources**



Source: Bollard Acoustical Consultants, Inc.

## 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, while vibration is usually associated with transmission through a structure. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate by a few ten-thousandths to a few thousandths of an inch. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes will decrease with increasing distance. The maximum rate or velocity of particle movement is the commonly accepted descriptor of the vibration "strength." This is referred to as the peak particle velocity (ppv) and is typically measured in inches per second.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (inches/second). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity. Although aggregate mining and processing vibration levels are not expected to be significant for this project due to the relatively large distances between project equipment (sources) and acoustically sensitive receivers, an assessment of mining-related vibration levels is addressed nonetheless.

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases. Given the considerable distances between project-related sources of vibration and the nearest existing residences to the project site, the only realistic source of vibration with the potential to result in elevated vibration levels at those residences is blasting. An assessment of blasting-related noise and vibration impacts is included in this assessment.

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## Baseline Noise and Vibration Environments

### Identification of Existing Sensitive Receivers

BAC utilized aerial imagery and conducted site inspections to identify potentially affected sensitive receptors in the immediate and general project vicinity. A total of 9 receptor locations were selected to represent the nearest potentially affected sensitive receptors, as well as more distant receptors in the communities of Atascadero and Santa Margarita.

It should be noted that not every residence in the project vicinity was modeled in this analysis. Rather, some receptors were selected to be representative of groups of residences which are located in the same geographic area, or which experience similar noise exposure. The representative receptor locations evaluated in this analysis are shown on Figure 3.

### Baseline Noise Environment

Given the size of the project study area, and the substantial topographic differences both within the project boundaries and at nearby receptor areas, the existing ambient noise environment in the project vicinity varies. To quantify the existing ambient noise environment in the project area at locations representative of sensitive receptor locations, continuous/long-term ambient noise level measurements were conducted at 5 locations surrounding the project site from February 2-8, 2012. Continuous monitoring was conducted at each of the 5 locations for a period of 7 consecutive days, 2 of which were weekend periods.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used to complete the ambient noise level measurement surveys. The meters were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. Microphones were located at a height of 5 feet above ground and fitted with manufacturer's windscreens. Weather conditions present during the monitoring program were typical for the period. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 (Precision) sound measurement equipment (ANSI S1.4).

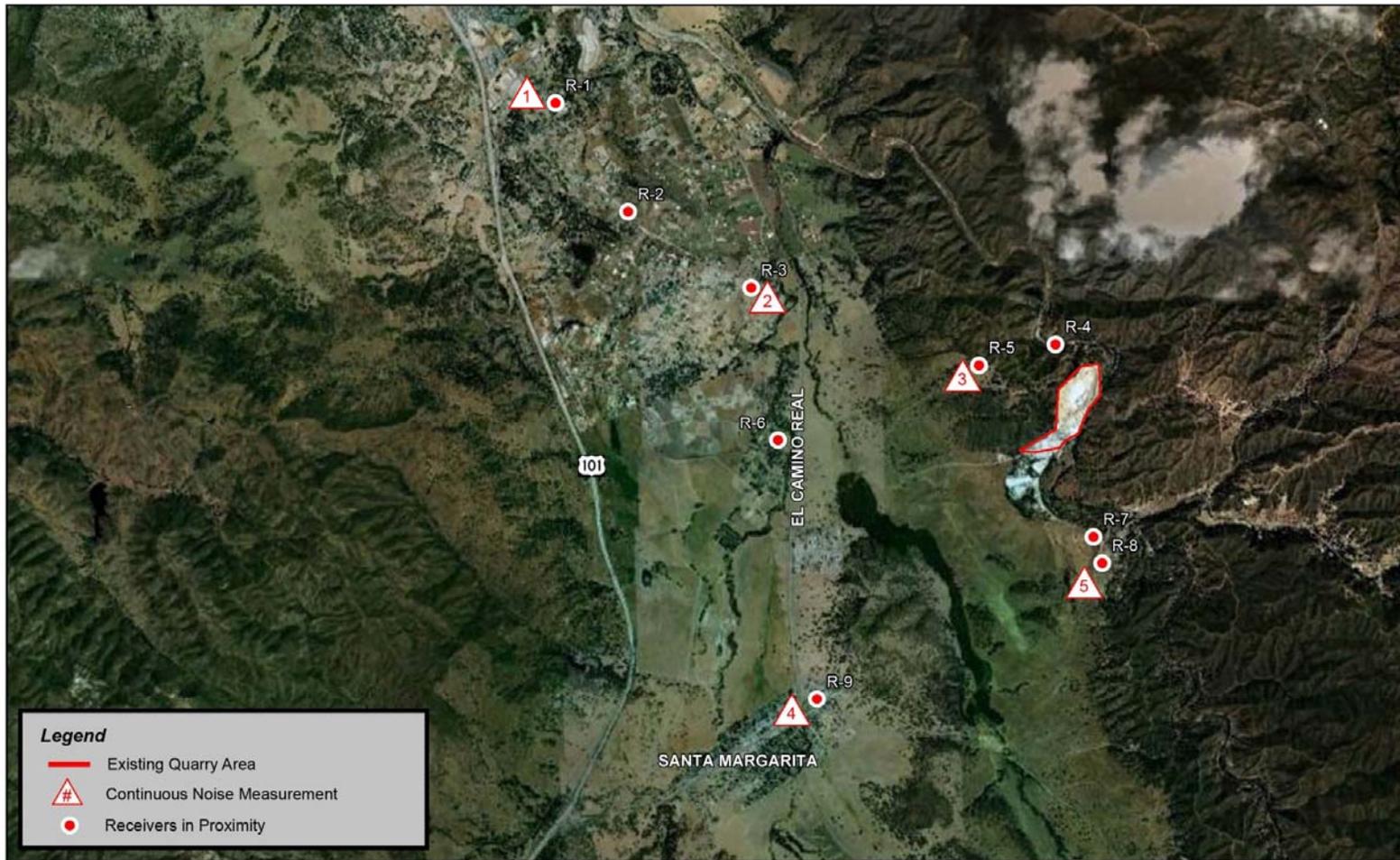
The noise measurement locations are shown on Figure 3. Figures 4 and 5 represent the receivers closest to the site for existing and future conditions, respectively. Figures 6(a) and 6(b) show examples of noise monitoring locations utilized for this survey.

The results of the continuous noise measurement surveys are summarized in Tables 1 and 2, and presented graphically in Appendix B. Table 2 summarizes the computed day/night average level (Ldn) values for each site for both weekend and weekday periods. Table 2 summarizes measured hourly average ( $Leq_{(h)}$ ) noise levels for both weekday and weekend periods, further broken down by daytime (7am-10pm) and nighttime (10 pm-7am) periods. Appendix B provides a graphic illustration of average noise levels at each measurement location over the course of a typical 24-hour period.

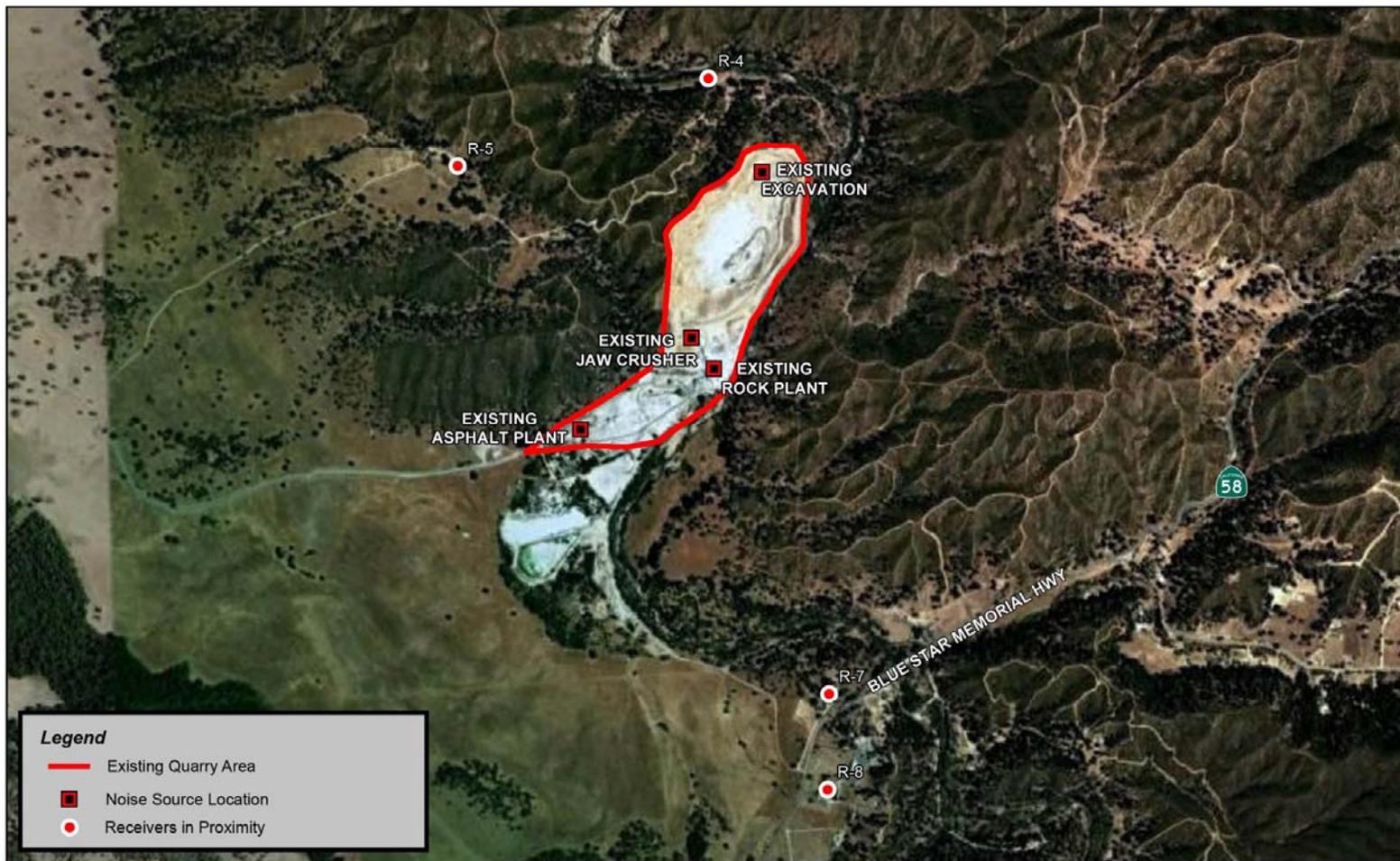
<b>Table 1</b>			
<b>Ambient Noise Measurement Results – Day/Night Average Level (Ldn)</b>			
<b>Santa Margarita Quarry Extension – San Luis Obispo County, California</b>			
Site <sup>1</sup>	Average Ldn <sup>2</sup>		Typical Noise Sources Affecting Measured Levels <sup>3</sup>
	Weekend	Weekday	
1	64	65	Local & distant traffic
2	66	69	Local traffic
3	40	43	Natural sounds, wind, birds. Distant aggregate operations.
4	59	65	Local traffic in Santa Margarita
5	67	69	Local traffic
1. Noise measurement sites are shown on Figure 3 2. Includes 2 weekend periods and 5 weekday periods. Each period represents 24 hours from midnight to midnight. 3. This information is not intended to represent a comprehensive list of all noise sources monitored. 4. Ldn values include a 10 dB penalty for noise occurring during nighttime hours.			

<b>Table 2</b>						
<b>Ambient Noise Measurement Results – Average Levels (Leq)</b>						
<b>Santa Margarita Quarry Extension – San Luis Obispo County, California</b>						
Site <sup>1</sup>	Weekday		Weekend		Combined	
	Day	Night	Day	Night	Day	Night
1	64	63	56	55	60	59
2	64	63	61	60	62	61
3	41	41	33	30	37	35
4	62	58	55	50	59	54
5	67	66	62	58	64	62
1. Noise measurement sites are shown on Figure 5 2. Includes 2 weekend periods and 3 weekday periods. Each period represents 24 hours from midnight to midnight.						

**Figure 3**  
Santa Margarita Quarry Extension - San Luis Obispo County, California  
Project Vicinity & Continuous Noise Measurement Locations

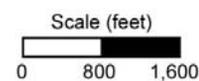


**Figure 4**  
Santa Margarita Quarry Extension - San Luis Obispo County, California  
Existing Quarry Location with Noise Sources and Nearby Receivers

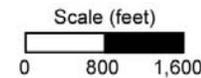
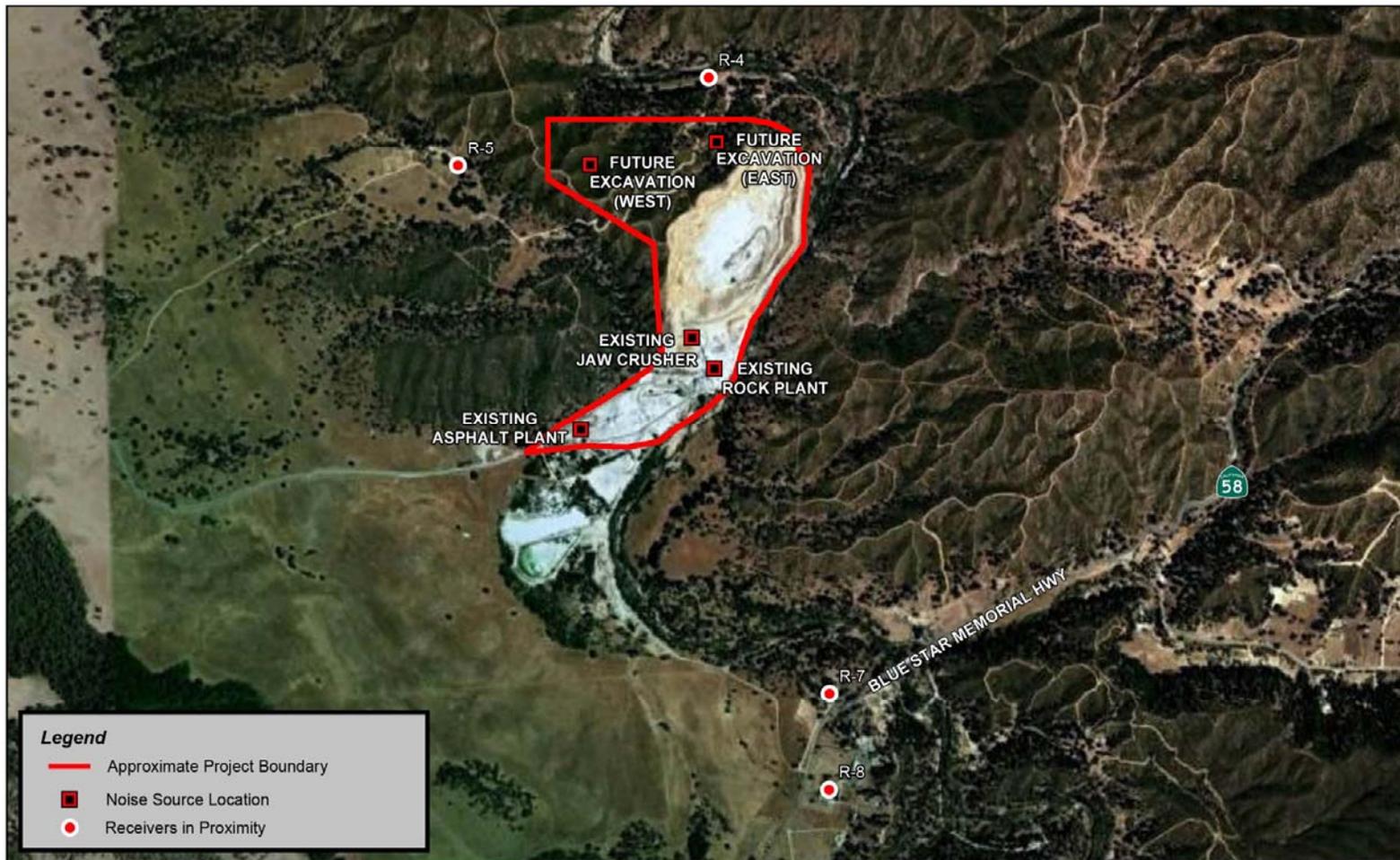


**Legend**

- Existing Quarry Area
- Noise Source Location
- Receivers in Proximity



**Figure 5**  
Santa Margarita Quarry Extension - San Luis Obispo County, California  
Future Quarry Extension with Noise Sources and Nearby Receivers



**Figure 6(a)**  
**Noise Monitoring Site Photo**



**Figure 6(b)**  
**Vibration Monitoring Site Photo**



## Baseline Vibration Environment

During the BAC field visits no significant sources of vibration were identified outside of the immediate aggregate excavation and processing areas. At the representative sensitive locations selected for ambient noise monitoring, BAC staff observations indicated that ambient vibration levels were indiscernible. A discussion of typical vibration levels associated with blasting activities follows.

## Baseline Blasting Noise and Vibration Environment

On May 20, 2009, BAC conducted noise and vibration monitoring during a typical aggregate shot (blast) at another Lehigh-Hansen Quarry in Santa Clara County, California. The monitoring was conducted from a distance of approximately 1500 feet with direct line of site to the shot area. Weather conditions present during the shot were as follows: 70 degrees Fahrenheit, clear sky, 5-10 mph north winds. Table 3 summarizes the noise and vibration data collected during the shot.

<b>Table 3 Blast Monitoring Results Lehigh Hanson Quarry (Santa Clara County) – May 20, 2009</b>	
Variable	Value
A-Weighted Maximum	67.0 dBA
Unweighted Peak Level	119.0 dB
Vmax-peak: Shot	0.1280 inches/second
Vmax-peak: Ambient	0.0018 inches/second
Distance	1,500 ft.
Holes Fired	36
Total Charge Weight	33,457 lbs.
Source: Bollard Acoustical Consultants	

Blasting regularly occurs at the Santa Margarita Quarry project site, and this will not change as a result of the proposed excavation area extension. The nearest residence to current blasting activities is over 2,000 feet away, and substantially shielded by an intervening Ridge. At that location, after accounting for topographic shielding, maximum noise levels generated by existing blasting activities are predicted to be less than 60 dBA based in the Table 3 data.

## Baseline Traffic Noise Environment

To describe existing noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The 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 was developed to predict hourly  $L_{eq}$  values for free-flowing traffic conditions. To predict traffic noise levels in terms of  $L_{dn}$ , it is necessary to adjust the input volume to account for the day/night distribution of traffic.

Traffic volumes for existing conditions were provided by Rick Engineering Company. Table 4 shows the predicted existing traffic noise levels in terms of  $L_{dn}$  at a reference distance of 100 feet from the centerlines of existing project-area roadways. This is considered to be the “baseline” condition. A listing of the FHWA Model input data for existing conditions is provided in Appendix D.

<b>Table 4</b>		
<b>Summary of Existing Traffic Noise Exposure for Local Area Roadways</b>		
<b>Santa Margarita Quarry Extension – San Luis Obispo County</b>		
<b>Roadway</b>	<b>Segment</b>	<b>Ldn dB @ 100 Feet</b>
US 101	n/o Santa Barbara Road	74
US 101	Santa Barbara Road – SR 58	74
US 101	s/o SR 58	74
Santa Barbara Road	US 101 NB Ramps – El Camino Real	63
El Camino Real	s/o Santa Barbara Road	64
El Camino Real	n/o Project Access Road	62
El Camino Real	s/o Project Access Road	62
El Camino Real	n/o SR 58	63
SR 58	Murphy Avenue – Pinal Avenue	65
SR 58	El Camino Real – Pozo Road	63
SR 58	c/o Pozo Road	59
Pozo Road	s/o SR 58	60
Source: Bollard Acoustical Consultants, Inc., FHWA RD-77-108		

Table 4 data indicate that traffic noise levels in the project vicinity (with the exception of one roadway segment) currently exceed the County’s standard for maximum allowable noise exposure at residential uses, 60 dB  $L_{dn}$ , seen in Table 5. It is important to note that the traffic noise levels seen in Table 4 include current truck traffic generated by the existing quarry.

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## Criteria for Acceptable Noise and Vibration Exposure

### California Environmental Quality Act (CEQA) Guidelines

The California Environmental Quality Act (CEQA), as applied by San Luis Obispo County, provides guidelines for use in assessing noise and vibration impacts associated with a project. Appendix G of the CEQA guidelines specifically state that a significant impact shall be identified if the project will result in any of the following:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

### Local Noise Standards

#### San Luis Obispo County General Plan Noise Element

For residential uses affected by transportation noise sources (i.e., off-site traffic), the County's Noise Element identifies 60 dB  $L_{dn}$  as an acceptable noise exposure limit. In addition, Policy 3.3.3 of the County's Noise Element states that noise created by new transportation noise sources shall be mitigated so as not to exceed the levels specified in Table 5 [Table 3-1 of the Noise Element] within the outdoor activity areas and interior spaces of existing noise sensitive land uses.

Chapter 4 of the County's Noise Element states that if mitigation must be applied to satisfy the policies in Chapter 3.3., the following mitigation measures shall be considered and preference shall be given where feasible to the measures in following item a:

- a) Site layout, including setbacks, open space separation and shielding of noise-sensitive uses with non-sensitive uses.
- b) Acoustical treatment of buildings.
- c) Structural measures: construction of earthen berms or wood or concrete barriers.

For residential uses affected by non-transportation (stationary or operational) noise sources (i.e., on-site aggregate extraction and processing), the County's Noise Element establishes performance standards as presented in Table 6 [Table 3-2 of the Noise Element]. For this project, the evaluation period is considered to be the worst-case hours during which on-site equipment would be operating, including maximum truck traffic operations.

**Table 5  
Maximum Allowable Noise Exposure – Transportation Noise Sources  
San Luis Obispo General Plan Noise Element**

Land Use	<u>Outdoor Activity Areas<sup>1</sup></u>		<u>Interior Spaces</u>	
	$L_{dn}/CNEL, dB$	$L_{dn}/CNEL, dB$	$L_{dn}/CNEL, dB$	$L_{eq}, dB^2$
Residential (except temporary dwellings and res accessory uses)	60 <sup>3</sup>	45	--	--
Bed and Breakfast Facilities, Hotels and Motels	60 <sup>3</sup>	45	--	--
Hospitals, Nursing and Personal Care	60 <sup>3</sup>	45	--	--
Public Assembly and Entertainment (except Meeting Halls)	--	--	--	35
Offices	60 <sup>3</sup>	--	--	45
Churches, Meeting Halls	--	--	--	45
Schools-Preschool to Secondary, College and University, Specialized Education and Training Libraries and Museums	--	--	--	45
Outdoor Sports and Recreation	70	--	--	--

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  $L_{dn}/CNEL$  may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

**Table 6  
Maximum Allowable Noise Exposure – Stationary Noise Sources<sup>1</sup>  
San Luis Obispo General Plan Noise Element**

Noise Metric	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.) <sup>2</sup>
Hourly $L_{eq}, dB$	50	45
Maximum level, dB	70	65
Maximum level, dB – Impulsive Noise	65	60

1. As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.  
2. Applies only where the receiving land use operates or is occupied during nighttime hours.

## Noise Level Increase Criteria

As noted above in the discussion of CEQA guidelines, if a project results in a substantial permanent or temporary increase in ambient noise levels in the project vicinity above levels existing without the project, the noise impacts of the project are considered to be significant. The CEQA guidelines do not, however, define what constitutes a significant temporary or permanent increase.

It is generally recognized that an increase of at least 3 dB for similar noise sources is usually required before most people will perceive a change in noise levels, and an increase of 6 dB is required before the change will be clearly noticeable (*Egan, Architectural Acoustics, McGraw Hill*). Given these levels of perception, this analysis considers a project-related increase of 5 dB or more to be significant.

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered unacceptable. Because every physical process creates noise, whether by the addition of a single vehicle on a roadway, or a tractor in an agricultural field, the use of audibility alone as a significance criterion would be unworkable. CEQA requires a substantial increase in noise levels before noise impacts are identified, not simply an audible change.

## Vibration Criteria

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 7 indicates that the threshold for damage to structures ranges from 2 to 6 in/sec peak particle velocity (ppv). One-half this minimum threshold, or 1 in/sec ppv is considered a criterion that would protect against significant architectural or structural damage. The general threshold at which human annoyance could occur is noted as one tenth of that level, or 0.1 in/sec ppv.

<b>Effects on Structures and People</b>	<b>Peak Vibration Threshold (in./sec. ppv)</b>
Structural damage to commercial structures	6
Structural damage to residential structures	2
Architectural damage to structures (cracking, etc.)	1
General threshold of human annoyance	0.1
General threshold of human perception	0.01

Sources: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans, 1976

### **Thresholds of Significance Applied to This Project**

As noted in the CEQA guidelines, a project's noise impacts must also be assessed relative to existing ambient noise conditions existing before the project. The ambient noise measurement results indicate that existing ambient noise levels varied by monitoring site, but with the exception of Site 3, existing noise levels already exceed the existing county standards for both transportation and non-transportation noise sources. As a result, if the project noise levels by themselves satisfy the County noise standards shown in Tables 4 and 5, the project-related increase in existing ambient noise levels would be negligible. In other words, the project would not result in a substantial increase in ambient noise levels.

At receptors R4 & R5, which represent the two closest sensitive areas to the proposed mine extension, existing weekday daytime and nighttime ambient noise levels are approximately 40 dB (based on measurements conducted at R5 (noise measurement Site 3 on Figure 3)). Given the lower ambient noise environment at these locations, daytime and nighttime thresholds of 45 dB Leq would be adequate to ensure that that project noise exposure does not result in significant noise impacts.

Vibration impacts are identified relative to the noise standards shown in Table 7.

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## Project Noise Impact Evaluation

### Overview of Existing and Proposed Project Operations

Aggregate excavation and processing operations at the Quarry has been ongoing for many years, and the project does not propose changes to how the aggregate is excavated or processed. The only differences in quarry noise generation which will result from this project would be a relocation of the jaw crusher and extension of excavation equipment operations to the northwest. Operations at the Processing and Asphalt Plants (see Figure 1 for locations), will continue at their current locations with no proposed changes in operating hours or equipment. As a result, the noise generation of these activities will remain at current levels and are considered part of the baseline noise environment. The Jaw Crusher will progress further northwest into the extended excavation areas to reduce the haul truck travel distances, but the noise-generation of that equipment will not change. Finally, excavation activities will naturally extend to the northwest with the extended mine area. So while excavation activities will not generate different noise levels than currently exist, the noise will be generated at locations in closer proximity to receptors R4 and R5.

### Methodology

To predict project-generated noise levels to the identified receptor locations, reference noise level data was first collected by BAC for each significant noise-producing activity, facility and equipment type currently in operation at the project site. That reference noise level data, along with digitized project base maps, existing and proposed site topography, and digitized source and receptor locations, were input into a state of the art three-dimensional sound propagation model called SoundPlan. The SoundPlan model then projected the reference noise levels from each source type and location to each of the 9 receptor locations, accounting for the effects of topographic shielding, ground attenuation, and atmospheric absorption.

## Reference Noise Levels

Reference noise level monitoring was performed by BAC staff at the existing quarry in September of 2011. The reference noise level data collection program was specifically conducted to isolate and quantify the noise emissions of several major noise-producing components of the Santa Margarita facility. The reference noise level data are necessary to evaluate project noise impacts. For example, if it is known that front-loaders and off-road haul trucks will be utilized in the proposed quarry extension area, impacts associated with those operations can be modeled by overlaying reference noise level data collected in the existing quarry area on top of locations where such operations would take place within the proposed quarry extension area.

To achieve isolation of individual noise sources, a variety of noise monitoring locations were utilized for the reference noise surveys. Examples of equipment monitored included loading of off-road haul trucks using front-loaders, movement of aggregate materials with bulldozers, jaw crusher operations, and crushing/screening operations at the main aggregate processing plant. The Asphalt Plant was not in operation at the time of the BAC site visit so BAC file data for a similarly-sized plant were utilized to establish reference levels for this equipment. Figure 9 illustrates a typical reference noise measurement location. Table 8 provides a summary of the reference noise measurement results.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters and a LDL 2900 frequency analyzer were used for the reference noise level measurements. The meters were calibrated before use with an LDL Model CAL200 acoustical calibrator to ensure the measurement accuracy. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

**Figure 9 – Representative Reference Noise Measurement Site**



**Table 8**  
**Reference Noise Level Data at 100 feet**  
**Santa Margarita Quarry Extension Project – San Luis Obispo County**

Noise Source	Leq, dBA <sup>1</sup>	SEL, dBA <sup>2</sup>	Lmax, dBA
Jaw Crusher	79	n/a	85
Main Processing Plant	77	n/a	85
Asphalt Plant <sup>3</sup>	78	n/a	85
Front-Loaders	75	n/a	82
Off-Road Haul Truck	n/a	87	84

## Notes:

1. Leq values were quantified for equipment that operates in a more or less stationary position or within a limited area for extended periods.
2. SEL data were collected for sources of noise that were transient, such as passages of off-road haul trucks and water trucks. The SEL data was ultimately used with operational information to develop hourly average noise levels for the transient noise sources.
3. The Asphalt Plant was not in operation at the time of the BAC site visit. BAC file data for a similarly-sized plant were utilized to establish reference levels for this equipment.
4. Source: Bollard Acoustical Consultants, Inc.

## Predicted Project-Generated Noise Levels and Identified Noise Impacts

### Excavation Impact Evaluation for the Extended Mine Area

The results of the SoundPlan modeling exercise are provided in Table 9 in terms of hourly average noise levels ( $L_{eq}$ ). The Table 9 results are based on the assumption that existing and proposed activities would occur continuously for the entire duration of any given hour. Appendix G illustrates changes in noise contours for the proposed project relative to existing conditions.

**Table 9**  
**Predicted Average Noise Levels (Leq, dBA) at Study Area Receptors**  
**Santa Margarita Quarry Extension Project – San Luis Obispo County, California**

Receptor <sup>1</sup>	Existing Quarry Operations	Extended Operations (North) <sup>2</sup>	Extended Operations (South) <sup>3</sup>
1	<20	<20	<20
2	24	23	23
3	28	28	28
4	31	39	43
5	31	31	31
6	31	31	30
7	43	42	41
8	44	42	42
9	28	28	28

## Notes:

1. Receptor locations are identified on Figure 3.
2. Excavation activities were conservatively modeled at the location nearest to Receptor 4.
3. Excavation activities were conservatively modeled at the location nearest to Receptor 5.

The Table 9 data indicate that the project-generated noise levels would be 43 dB Leq or less at all representative sensitive receptors in the immediate and general project vicinity. The range of predicted noise levels is both within compliance of the San Luis Obispo County noise standards and at or below measured existing ambient noise levels. Therefore, ***no adverse noise impacts are identified relative to the proposed extension of excavation activities to the northwest.*** As a result, ***no noise mitigation is warranted for noise generated by on-site activities.***

### **Project Blasting Impact Evaluation**

Noise generated by aggregate shots is variable, depending on the amount of charge-material used, the number of holes and the depth of those holes, timing delays, and other factors. There tends to be misconceptions regarding what a quarry “shot” looks and sounds like, due in part to the types of explosions which are frequently seen in movies. In reality, aggregate shots are designed to transfer the energy of the shot into the ground, rather than have it vent into the atmosphere.

As noted previously in this analysis, reference vibration measurements were conducted during a typical blasting operation at the Hansen Santa Clara County Quarry on May 20, 2009. The monitoring was conducted from a position on the edge of the North Quarry pit at a distance of approximately 1500 feet with direct line of site to the shot area. As noted in Table 3, the measured vibration level of the shot was 0.1280 inches per second, peak particle velocity. The measured level is below the thresholds at which the onset of annoyance or damage to structures can be expected (See Table 6). Because the nearest existing sensitive receptors to the proposed South Quarry area would be more than 1,500 feet from blasting areas, blast-induced vibration levels are predicted to be lower at those receptors than the reference level reported in Table 3. In addition, because blasting activities are brief, relatively infrequent, and limited to daytime hours, and because the use of the camp area identified by receptor R4 is intermittent, blasting vibration impacts are similarly not expected to be significant at that nearby camp area. As a result, ***no adverse vibration impacts are anticipated to occur as a result of the project.***

### **Off-Site Traffic Noise Increase Impact Evaluation**

To quantitatively assess traffic noise levels associated with the Project, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The Model is based on 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.

Traffic volumes for future (20-25 years) conditions without the Project were provided by Rick Engineering Company. The Project’s proposed truck usage with average and peak hour operations of the area roadways was also provided by Rick Engineering Company, taking into account the planned yearly material production. Table 10 shows the predicted future project traffic noise levels in terms of  $L_{dn}$  at a reference distance of 100 feet from the centerlines of existing project-area roadways for all project scenarios. The extent by which existing land uses located along the roadways listed below are affected by existing traffic noise depends on their proximity to the roads and their individual sensitivity to noise. A listing of the FHWA Model input data is provided in Appendix D

**Table 10**  
**Summary of Traffic Noise Exposure Calculations**  
**Santa Margarita Quarry Extension – San Luis Obispo County**

		Ldn dB @ 100 Feet							
Roadway	Segment	Existing + Approved Projects	Exist. + Project w/ Average Operations	Exist. + Project w/ Peak Operations	Change	Cumulative	Cumulative	Cumulative	Change
							+ Project w/ Average Operations	+ Project w/ Peak Operations	
US 101	n/o Santa Barbara Road	74	74	75	0 / 1	74	74	75	0 / 1
US 101	Santa Barbara Road – SR 58	74	74	74	0 / 0	74	74	74	0 / 0
US 101	s/o SR 58	74	74	75	0 / 1	74	74	75	0 / 1
Santa Barbara Road	US 101 NB Ramps – El Camino Real	63	63	65	0 / 2	63	64	65	1 / 2
El Camino Real	s/o Santa Barbara Road	64	64	66	0 / 2	64	65	66	1 / 2
El Camino Real	n/o Project Access Road	62	62	65	0 / 3	63	64	65	1 / 2
El Camino Real	s/o Project Access Road	62	62	64	0 / 2	62	63	64	1 / 2
El Camino Real	n/o SR 58	63	63	65	0 / 2	63	64	65	1 / 2
SR 58	Murphy Avenue – Pinal Avenue	65	65	66	0 / 1	65	66	66	1 / 1
SR 58	El Camino Real – Pozo Road	63	63	63	0 / 0	63	63	63	0 / 0
SR 58	c/o Pozo Road	59	59	60	0 / 1	59	59	60	0 / 1
Pozo Road	s/o SR 58	60	60	60	0 / 0	60	60	60	0 / 0

Source: Bollard Acoustical Consultants, Inc., FHWA RD-77-108

The Table 10 modeling data indicate that the project-related increase in traffic noise levels associated with average operations would range from 0-1 dB relative to baseline conditions, and that the increase associated with peak operating conditions would range from 0-3 dB Ldn relative to baseline conditions. The modeling results are considered conservative because the applicant is not seeking any approval to increase production output, and post-project traffic is expected to remain consistent with average and peak traffic during past periods of quarry operations. It should be noted that the projected 3 dB increase would only occur on one roadway segment under peak conditions, and peak conditions have historically occurred infrequently. Because the projected off-site traffic noise increases are all below the 5 dB standard of significance, **this impact is considered to be less than significant**. As a result, **no noise mitigation is warranted for noise generated by off-site traffic**.

### Project Vibration Impact Evaluation

This section focuses in the assessment of potential impacts associated with project-generated vibration associated with heavy earthmoving equipment. With the exception of blasting activities, the project does not propose the introduction of appreciable sources of vibration into areas where such vibration is not being generated. Nonetheless, vibration generated by heavy earthmoving equipment is evaluated in this section, in addition to blast-generated vibration.

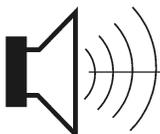
To quantify reference vibration levels generated by heavy equipment currently operating at the Santa Margarita Quarry, BAC utilized vibration measurement data collected by BAC staff at the Permanente facility in Santa Clara County in 2009. A Larson Davis Laboratories Model HVM vibration meter and a PCB Piezotronics Model 356B08 vibration transducer were used for the reference vibration measurements. Peak particle velocities representing the sum of all peak vibration levels along the x, y and z axes, were measured during the survey. Table 11 summarizes the vibration measurement data.

Vibration Source	Measurement Distance, ft.	Peak Particle Velocity (in/sec)
Bulldozers	35	0.0209
Front-Loaders	100	0.0047
100 Ton Off-Road Haul Truck	80	0.0059
150 Ton Off-Road Haul Truck	100	0.0062
Water Truck	100	0.0070
Rock Drill	50	0.0187

The vibration measurement results shown in Table 11 indicate that heavy equipment-generated vibration levels were below the thresholds for annoyance and damage to structures even at the very close measurement locations. As a result, at receptors located several hundred to thousands of feet from the proposed operations, project vibration levels generated by heavy earthmoving equipment are expected to be well below the threshold of perception, and **excavation vibration impacts are predicted to be less than significant**.

## Appendix A Acoustical Terminology

<b>Acoustics</b>	The science of sound.
<b>Ambient Noise</b>	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
<b>Attenuation</b>	The reduction of an acoustic signal.
<b>A-Weighting</b>	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
<b>Decibel or dB</b>	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
<b>CNEL</b>	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
<b>Frequency</b>	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
<b>L<sub>dn</sub></b>	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
<b>Leq</b>	Equivalent or energy-averaged sound level.
<b>L<sub>max</sub></b>	The highest root-mean-square (RMS) sound level measured over a given period of time.
<b>Loudness</b>	A subjective term for the sensation of the magnitude of sound.
<b>Masking</b>	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.
<b>Noise</b>	Unwanted sound.
<b>Peak Noise</b>	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the Maximum level, which is the highest RMS level.
<b>RT<sub>60</sub></b>	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
<b>Sabin</b>	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
<b>SEL</b>	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.
<b>Threshold of Hearing</b>	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
<b>Threshold of Pain</b>	Approximately 120 dB above the threshold of hearing.



B O L L A R D

Acoustical Consultants

Appendix B-1  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Thursday, February 02, 2012**

Hour	Leq	Lmax	L50	L90
0:00	50	72	42	36
1:00	46	68	40	34
2:00	48	72	41	33
3:00	49	71	41	33
4:00	60	91	40	33
5:00	58	81	49	42
6:00	62	80	56	49
7:00	65	84	61	55
8:00	65	83	62	56
9:00	66	84	61	55
10:00	64	82	60	54
11:00	65	83	60	54
12:00	64	83	60	53
13:00	64	87	59	52
14:00	64	80	59	51
15:00	64	82	60	53
16:00	63	82	59	52
17:00	65	87	59	53
18:00	62	80	58	50
19:00	60	80	55	50
20:00	61	85	54	50
21:00	59	77	53	49
22:00	57	78	50	45
23:00	54	77	49	43

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65.6	58.8	63.7	62.4	46.2	56.8
Lmax (Maximum)	87.3	77.2	82.5	90.9	67.7	76.6
L50 (Median)	62.3	53.5	58.8	55.8	39.5	45.4
L90 (Background)	56.5	48.5	52.5	48.5	32.7	38.7

Computed Ldn, dB	65.2
% Daytime Energy	89%
% Nighttime Energy	11%



Appendix B-2  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Friday, February 03, 2012**

Hour	Leq	Lmax	L50	L90
0:00	53	83	44	39
1:00	48	74	42	36
2:00	47	70	40	34
3:00	46	68	41	36
4:00	58	88	45	40
5:00	58	80	51	46
6:00	62	81	56	50
7:00	67	91	61	57
8:00	64	85	60	55
9:00	66	90	60	54
10:00	63	85	57	51
11:00	66	92	58	51
12:00	63	80	58	51
13:00	65	88	59	51
14:00	63	79	59	53
15:00	65	89	59	54
16:00	63	81	59	54
17:00	65	82	60	55
18:00	64	86	58	54
19:00	62	83	55	50
20:00	60	86	54	49
21:00	59	75	53	48
22:00	59	86	51	47
23:00	55	76	49	44

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.6	58.8	64.0	61.6	46.3	56.7
Lmax (Maximum)	91.9	75.0	84.8	87.5	67.6	78.2
L50 (Median)	61.4	53.0	58.1	56.2	40.3	46.7
L90 (Background)	57.0	48.1	52.5	50.4	33.5	41.4

Computed Ldn, dB	65.2
% Daytime Energy	90%
% Nighttime Energy	10%



Appendix B-3  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Saturday, February 04, 2012**

Hour	Leq	Lmax	L50	L90
0:00	60	90	46	41
1:00	52	77	44	40
2:00	48	69	43	38
3:00	53	82	41	36
4:00	51	76	43	37
5:00	54	75	47	43
6:00	58	80	50	46
7:00	61	81	54	49
8:00	63	81	57	50
9:00	66	81	62	52
10:00	64	82	61	53
11:00	66	94	61	53
12:00	65	94	59	53
13:00	61	79	56	50
14:00	64	91	57	50
15:00	64	89	58	51
16:00	62	83	57	51
17:00	63	87	58	52
18:00	66	95	58	53
19:00	61	79	56	51
20:00	59	76	54	50
21:00	60	80	54	48
22:00	59	83	53	49
23:00	56	79	50	45

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.3	58.8	63.5	59.6	47.7	56.0
Lmax (Maximum)	94.7	75.7	84.6	89.5	69.1	79.0
L50 (Median)	61.7	53.7	57.4	52.8	41.3	46.2
L90 (Background)	53.2	48.2	51.1	48.9	36.1	41.6

Computed Ldn, dB	64.6
% Daytime Energy	90%
% Nighttime Energy	10%



Appendix B-4  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Sunday, February 05, 2012**

Hour	Leq	Lmax	L50	L90
0:00	54	74	47	42
1:00	51	73	44	40
2:00	51	78	43	39
3:00	49	75	41	37
4:00	50	74	41	35
5:00	52	73	46	42
6:00	56	78	49	45
7:00	59	76	53	48
8:00	66	90	55	47
9:00	61	81	56	48
10:00	63	85	57	49
11:00	63	84	59	50
12:00	62	82	57	50
13:00	66	94	59	51
14:00	65	92	56	49
15:00	61	80	55	47
16:00	62	92	52	43
17:00	60	81	53	47
18:00	61	87	53	47
19:00	63	91	57	53
20:00	58	76	54	50
21:00	56	75	50	46
22:00	56	83	49	45
23:00	54	76	47	43

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.2	56.4	62.7	56.4	48.8	53.4
Lmax (Maximum)	93.5	75.0	84.5	82.9	72.5	76.1
L50 (Median)	59.2	50.3	55.1	48.9	41.1	45.2
L90 (Background)	52.9	43.1	48.3	45.1	35.4	40.8

Computed Ldn, dB	63.0
% Daytime Energy	93%
% Nighttime Energy	7%



Appendix B-5  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Monday, February 06, 2012**

Hour	Leq	Lmax	L50	L90
0:00	49	72	43	38
1:00	46	69	38	33
2:00	47	70	41	36
3:00	48	70	42	37
4:00	53	76	45	41
5:00	58	79	50	46
6:00	62	81	56	50
7:00	67	90	62	57
8:00	64	79	60	55
9:00	65	81	61	53
10:00	66	93	61	52
11:00	64	82	59	51
12:00	66	89	59	50
13:00	64	81	59	51
14:00	66	90	59	52
15:00	65	87	60	54
16:00	65	89	59	53
17:00	63	81	59	54
18:00	61	86	56	49
19:00	61	86	53	46
20:00	58	80	51	44
21:00	56	76	49	44
22:00	56	78	46	41
23:00	53	76	46	41

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.6	56.1	64.0	61.5	45.7	55.4
Lmax (Maximum)	93.2	76.1	84.7	80.7	69.4	74.5
L50 (Median)	61.6	49.2	57.8	56.1	38.5	45.4
L90 (Background)	57.0	44.1	51.1	50.3	33.3	40.3

Computed Ldn, dB	64.6
% Daytime Energy	92%
% Nighttime Energy	8%



Appendix B-6  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Tuesday, February 07, 2012**

Hour	Leq	Lmax	L50	L90
0:00	49	73	39	32
1:00	43	68	35	30
2:00	41	63	36	31
3:00	45	68	34	30
4:00	61	92	43	33
5:00	58	80	50	44
6:00	61	79	56	48
7:00	66	81	63	58
8:00	66	80	65	58
9:00	65	80	61	52
10:00	63	82	58	50
11:00	64	83	60	53
12:00	63	79	58	51
13:00	63	78	58	52
14:00	63	83	59	53
15:00	65	81	60	55
16:00	64	87	60	55
17:00	64	83	60	55
18:00	64	89	58	52
19:00	60	78	54	48
20:00	60	78	53	46
21:00	58	76	52	46
22:00	55	74	49	43
23:00	54	77	45	39

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65.9	58.3	63.6	61.5	40.9	56.4
Lmax (Maximum)	88.5	75.9	81.1	92.5	63.5	75.1
L50 (Median)	64.6	51.8	58.6	55.8	34.3	43.0
L90 (Background)	58.5	45.8	52.2	48.2	29.5	36.9

Computed Ldn, dB	64.9
% Daytime Energy	90%
% Nighttime Energy	10%



Appendix B-7  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Wednesday, February 08, 2012**

Hour	Leq	Lmax	L50	L90
0:00	50	72	43	37
1:00	50	75	40	33
2:00	52	79	40	31
3:00	47	69	43	36
4:00	56	84	46	38
5:00	59	83	54	49
6:00	62	80	58	53
7:00	67	88	63	58
8:00	65	85	61	56
9:00	64	83	59	53
10:00	64	82	58	51
11:00	64	80	60	52
12:00	65	83	61	53
13:00	64	86	58	50
14:00	64	85	58	50
15:00	64	86	59	52
16:00	64	81	59	53
17:00	65	94	59	53
18:00	63	82	57	49
19:00	60	82	54	48
20:00	60	82	56	49
21:00	59	78	52	46
22:00	57	79	50	44
23:00	55	76	50	44

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.7	58.6	63.8	61.6	47.3	56.3
Lmax (Maximum)	94.0	77.6	83.7	84.4	68.6	77.3
L50 (Median)	62.9	52.2	58.4	57.5	40.3	47.1
L90 (Background)	57.6	46.3	51.5	53.1	31.3	40.7

Computed Ldn, dB	64.9
% Daytime Energy	90%
% Nighttime Energy	10%



Appendix B-8  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Thursday, February 02, 2012**

Hour	Leq	Lmax	L50	L90
0:00	89	111	70	56
1:00	84	109	62	37
2:00	78	110	64	56
3:00	72	77	72	68
4:00	81	110	37	35
5:00	94	110	51	36
6:00	108	113	107	100
7:00	111	115	111	108
8:00	110	113	110	105
9:00	111	115	112	108
10:00	109	115	110	62
11:00	74	97	57	45
12:00	65	81	58	43
13:00	65	82	57	42
14:00	66	84	59	43
15:00	66	79	62	47
16:00	65	77	60	45
17:00	66	80	60	46
18:00	64	78	57	44
19:00	62	86	50	39
20:00	60	80	47	38
21:00	60	77	46	38
22:00	57	77	42	36
23:00	53	73	38	36

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	111.5	59.7	104.7	107.7	53.0	98.4
Lmax (Maximum)	115.2	77.3	90.6	113.0	73.1	98.8
L50 (Median)	111.5	46.1	70.3	106.7	36.8	60.3
L90 (Background)	108.4	37.8	56.9	100.0	35.2	51.2

Computed Ldn, dB	106.5
% Daytime Energy	88%
% Nighttime Energy	12%



Appendix B-9  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Friday, February 03, 2012**

Hour	Leq	Lmax	L50	L90
0:00	52	78	37	36
1:00	49	73	37	36
2:00	50	75	38	36
3:00	47	72	38	36
4:00	73	109	40	37
5:00	68	98	45	40
6:00	64	97	50	43
7:00	65	79	58	45
8:00	63	76	56	43
9:00	65	81	56	43
10:00	64	80	55	41
11:00	64	79	53	41
12:00	65	88	56	41
13:00	64	78	57	42
14:00	64	81	57	44
15:00	65	78	60	46
16:00	65	76	61	46
17:00	65	80	61	48
18:00	63	78	56	45
19:00	61	78	51	42
20:00	60	78	48	40
21:00	59	78	46	39
22:00	58	74	45	39
23:00	56	73	41	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65.4	59.3	63.9	73.4	47.2	65.5
Lmax (Maximum)	88.0	76.1	79.2	108.8	71.8	83.2
L50 (Median)	61.2	46.4	55.3	49.6	37.1	41.1
L90 (Background)	47.8	39.5	43.0	42.9	36.1	37.9

Computed Ldn, dB	71.7
% Daytime Energy	53%
% Nighttime Energy	47%



Appendix B-10  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Saturday, February 04, 2012**

Hour	Leq	Lmax	L50	L90
0:00	52	73	38	36
1:00	52	73	38	36
2:00	66	98	37	35
3:00	55	69	42	33
4:00	53	66	41	34
5:00	71	108	39	34
6:00	57	75	50	34
7:00	60	76	55	46
8:00	67	90	59	47
9:00	55	67	46	37
10:00	59	72	50	38
11:00	63	80	54	39
12:00	64	83	57	47
13:00	63	75	55	42
14:00	64	80	57	50
15:00	64	79	59	48
16:00	64	79	58	51
17:00	64	76	57	44
18:00	64	82	55	42
19:00	61	78	50	40
20:00	60	78	48	37
21:00	60	78	47	38
22:00	59	76	46	38
23:00	58	77	43	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.7	54.6	62.9	71.3	52.0	63.5
Lmax (Maximum)	89.9	67.3	78.2	108.0	66.1	79.4
L50 (Median)	59.0	45.6	53.7	49.7	36.9	41.5
L90 (Background)	50.6	36.6	43.1	37.6	32.7	35.2

Computed Ldn, dB	69.8
% Daytime Energy	59%
% Nighttime Energy	41%



Appendix B-11  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Sunday, February 05, 2012**

Hour	Leq	Lmax	L50	L90
0:00	55	75	38	36
1:00	53	74	38	36
2:00	47	71	37	36
3:00	46	70	36	35
4:00	50	72	36	35
5:00	62	99	37	35
6:00	54	72	39	36
7:00	57	79	41	38
8:00	60	80	45	38
9:00	62	76	50	40
10:00	63	86	55	45
11:00	63	78	55	41
12:00	62	75	53	39
13:00	64	81	57	42
14:00	67	97	56	41
15:00	64	90	54	40
16:00	61	77	49	39
17:00	61	78	48	37
18:00	59	80	46	37
19:00	62	77	53	43
20:00	59	74	47	38
21:00	58	75	43	36
22:00	55	74	40	36
23:00	55	76	38	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	67.2	56.7	62.3	62.4	46.3	55.7
Lmax (Maximum)	96.9	74.4	80.1	99.0	70.1	76.0
L50 (Median)	56.8	41.2	50.0	40.1	35.8	37.6
L90 (Background)	44.7	36.3	39.6	36.5	34.5	35.7

Computed Ldn, dB	63.9
% Daytime Energy	88%
% Nighttime Energy	12%



Appendix B-12  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Monday, February 06, 2012**

Hour	Leq	Lmax	L50	L90
0:00	51	76	36	35
1:00	49	74	36	35
2:00	48	73	36	35
3:00	47	71	37	35
4:00	53	74	38	36
5:00	58	76	42	37
6:00	61	76	48	40
7:00	65	79	56	45
8:00	65	86	59	44
9:00	64	80	55	42
10:00	64	81	56	42
11:00	64	78	54	40
12:00	64	80	56	42
13:00	64	80	57	46
14:00	64	79	58	47
15:00	65	80	59	46
16:00	64	78	58	47
17:00	64	79	57	45
18:00	62	79	51	39
19:00	61	84	48	38
20:00	58	75	45	38
21:00	57	73	43	36
22:00	54	73	40	36
23:00	52	73	40	36

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65.1	56.6	63.6	60.8	47.5	54.8
Lmax (Maximum)	86.4	73.2	79.5	76.1	70.7	74.0
L50 (Median)	59.3	42.7	54.1	47.7	36.3	39.2
L90 (Background)	47.1	36.0	42.5	40.1	35.0	36.3

Computed Ldn, dB	64.1
% Daytime Energy	93%
% Nighttime Energy	7%



Appendix B-13  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Tuesday, February 07, 2012**

Hour	Leq	Lmax	L50	L90
0:00	50	72	36	34
1:00	49	77	41	38
2:00	43	54	41	37
3:00	48	72	36	34
4:00	54	76	44	35
5:00	59	75	47	38
6:00	61	75	49	42
7:00	66	80	58	47
8:00	65	76	58	46
9:00	63	80	51	42
10:00	61	76	50	41
11:00	63	79	55	43
12:00	64	85	54	42
13:00	63	79	55	42
14:00	65	78	58	45
15:00	65	79	59	45
16:00	65	78	60	46
17:00	64	78	59	44
18:00	63	80	54	41
19:00	60	79	47	38
20:00	60	76	48	38
21:00	59	78	46	36
22:00	56	74	41	34
23:00	51	72	35	33

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65.6	59.5	63.4	60.7	42.9	55.2
Lmax (Maximum)	84.7	75.7	78.6	77.1	53.9	72.1
L50 (Median)	60.5	45.6	54.2	48.5	34.7	40.8
L90 (Background)	47.1	35.6	42.4	41.7	33.1	36.2

Computed Ldn, dB	64.2
% Daytime Energy	92%
% Nighttime Energy	8%



Appendix B-14  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Wednesday, February 08, 2012**

Hour	Leq	Lmax	L50	L90
0:00	67	99	35	34
1:00	46	70	35	33
2:00	50	75	37	33
3:00	65	99	36	34
4:00	76	109	56	35
5:00	65	86	59	46
6:00	65	81	58	45
7:00	64	82	54	42
8:00	63	86	54	41
9:00	59	75	52	42
10:00	59	74	53	42
11:00	61	78	54	40
12:00	66	81	58	42
13:00	64	80	56	42
14:00	66	86	61	48
15:00	66	80	60	46
16:00	66	81	61	47
17:00	65	79	60	44
18:00	63	76	55	42
19:00	61	76	49	41
20:00	62	85	50	40
21:00	59	78	45	35
22:00	55	72	42	34
23:00	52	74	35	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.0	58.6	63.5	76.4	46.2	68.1
Lmax (Maximum)	85.8	73.9	79.6	109.0	69.5	84.9
L50 (Median)	61.4	45.1	54.8	59.1	34.6	43.7
L90 (Background)	48.4	35.3	42.4	45.9	32.9	36.5

Computed Ldn, dB	74.1
% Daytime Energy	37%
% Nighttime Energy	63%



Appendix B-15  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Thursday, February 02, 2012**

Hour	Leq	Lmax	L50	L90
0:00	25	44	20	19
1:00	27	46	21	19
2:00	23	43	22	20
3:00	23	36	22	19
4:00	23	37	21	20
5:00	25	41	24	22
6:00	27	43	26	24
7:00	31	45	29	27
8:00	35	53	32	29
9:00	39	61	32	27
10:00	41	61	36	33
11:00	38	58	35	31
12:00	42	62	37	32
13:00	44	56	39	31
14:00	40	53	36	31
15:00	41	60	37	31
16:00	35	51	31	27
17:00	31	49	27	24
18:00	27	39	25	23
19:00	25	36	24	22
20:00	25	45	24	22
21:00	27	39	26	23
22:00	29	42	26	23
23:00	29	44	27	23

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	44.2	25.2	38.5	29.5	22.9	26.3
Lmax (Maximum)	62.0	35.8	51.2	46.2	36.1	41.8
L50 (Median)	38.5	24.2	31.5	26.5	20.1	23.1
L90 (Background)	33.3	22.2	27.6	23.6	18.8	21.0

Computed Ldn, dB	37.8
% Daytime Energy	96%
% Nighttime Energy	4%



Appendix B-16  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Friday, February 03, 2012**

Hour	Leq	Lmax	L50	L90
0:00	31	46	28	23
1:00	29	46	27	24
2:00	29	39	28	26
3:00	28	37	28	25
4:00	33	45	32	28
5:00	42	67	37	34
6:00	38	44	38	35
7:00	44	65	40	38
8:00	41	54	39	37
9:00	40	66	37	33
10:00	38	58	34	31
11:00	41	64	32	29
12:00	45	67	33	29
13:00	38	65	33	30
14:00	39	62	34	30
15:00	41	69	35	31
16:00	40	56	35	29
17:00	38	64	31	27
18:00	36	51	31	27
19:00	32	42	31	29
20:00	33	47	31	28
21:00	32	49	31	29
22:00	31	42	30	28
23:00	30	41	29	26

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	44.9	31.6	39.9	42.0	28.4	35.3
Lmax (Maximum)	68.9	42.2	58.5	66.7	36.9	45.2
L50 (Median)	40.4	30.7	33.8	38.1	27.2	30.8
L90 (Background)	38.4	27.2	30.6	35.4	22.7	27.5

Computed Ldn, dB	42.8
% Daytime Energy	83%
% Nighttime Energy	17%



Appendix B-17  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 3  
 Saturday, February 04, 2012

Hour	Leq	Lmax	L50	L90
0:00	30	43	28	26
1:00	30	41	29	25
2:00	26	34	25	22
3:00	29	41	27	24
4:00	32	46	30	27
5:00	32	40	31	28
6:00	34	43	34	31
7:00	37	52	36	34
8:00	39	60	37	35
9:00	46	70	43	38
10:00	45	72	33	30
11:00	41	69	34	29
12:00	38	60	34	29
13:00	48	73	33	28
14:00	39	62	34	29
15:00	37	56	33	29
16:00	42	63	33	30
17:00	36	61	30	27
18:00	28	41	27	23
19:00	27	44	26	23
20:00	30	42	29	24
21:00	31	43	30	27
22:00	30	40	29	26
23:00	31	47	28	24

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	48.2	27.0	41.4	34.3	25.9	31.1
Lmax (Maximum)	73.2	40.8	57.9	47.2	34.4	41.9
L50 (Median)	43.2	25.8	32.7	33.6	25.2	29.0
L90 (Background)	37.9	22.6	28.9	31.4	22.4	26.1

Computed Ldn, dB	41.3
% Daytime Energy	95%
% Nighttime Energy	5%



Appendix B-18  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 3  
 Sunday, February 05, 2012

Hour	Leq	Lmax	L50	L90
0:00	29	44	25	22
1:00	27	45	24	22
2:00	25	42	23	21
3:00	25	37	24	22
4:00	27	40	25	23
5:00	29	40	27	24
6:00	32	41	32	29
7:00	36	55	34	30
8:00	37	53	36	33
9:00	41	62	36	32
10:00	36	61	32	28
11:00	38	55	34	30
12:00	43	68	32	28
13:00	43	65	35	28
14:00	46	67	32	28
15:00	43	61	33	26
16:00	40	57	33	26
17:00	27	51	23	20
18:00	24	36	21	19
19:00	26	34	25	21
20:00	29	36	27	24
21:00	30	42	29	26
22:00	32	51	28	24
23:00	31	51	27	24

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	45.5	24.0	39.6	32.4	24.6	29.5
Lmax (Maximum)	68.1	33.5	53.5	51.0	37.3	43.4
L50 (Median)	35.8	21.3	30.9	31.5	22.9	26.0
L90 (Background)	32.7	18.7	26.5	28.7	21.2	23.4

Computed Ldn, dB	39.6
% Daytime Energy	95%
% Nighttime Energy	5%



Appendix B-19  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 3  
 Monday, February 06, 2012

Hour	Leq	Lmax	L50	L90
0:00	26	37	25	22
1:00	29	44	26	23
2:00	26	34	25	22
3:00	27	36	26	24
4:00	31	41	29	25
5:00	35	42	34	31
6:00	37	47	36	33
7:00	40	50	40	38
8:00	42	58	41	39
9:00	44	69	39	37
10:00	39	57	37	35
11:00	39	58	35	30
12:00	43	65	34	30
13:00	41	61	36	32
14:00	43	63	37	32
15:00	39	64	35	31
16:00	38	62	31	29
17:00	32	53	30	28
18:00	33	53	31	28
19:00	37	64	30	27
20:00	40	67	30	26
21:00	31	54	28	24
22:00	33	52	28	25
23:00	35	49	31	28

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	44.3	30.7	40.1	36.9	26.0	32.5
Lmax (Maximum)	69.1	49.9	59.9	51.8	34.2	42.4
L50 (Median)	40.5	28.1	34.3	36.1	24.8	29.0
L90 (Background)	38.6	23.7	31.0	33.4	22.3	26.1

Computed Ldn, dB	41.2
% Daytime Energy	91%
% Nighttime Energy	9%



Appendix B-20  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 3  
 Tuesday, February 07, 2012

Hour	Leq	Lmax	L50	L90
0:00	31	51	28	25
1:00	42	59	37	31
2:00	41	60	35	28
3:00	25	42	22	20
4:00	47	67	32	23
5:00	44	60	37	28
6:00	40	61	37	34
7:00	42	50	42	40
8:00	44	65	38	32
9:00	38	62	33	29
10:00	40	61	34	29
11:00	43	68	34	28
12:00	38	64	32	28
13:00	40	61	33	29
14:00	46	72	32	27
15:00	40	50	36	31
16:00	38	50	34	30
17:00	33	58	31	28
18:00	31	51	29	26
19:00	38	59	25	20
20:00	38	67	26	21
21:00	27	39	24	20
22:00	30	49	24	19
23:00	34	53	25	21

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	46.4	27.2	40.5	46.5	24.8	41.0
Lmax (Maximum)	72.1	38.7	58.3	66.9	42.4	55.8
L50 (Median)	41.7	23.8	32.2	37.3	21.7	30.7
L90 (Background)	40.1	20.0	27.9	34.2	19.4	25.5

Computed Ldn, dB	47.3
% Daytime Energy	60%
% Nighttime Energy	40%



Appendix B-21  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Wednesday, February 08, 2012**

Hour	Leq	Lmax	L50	L90
0:00	33	55	21	18
1:00	28	47	21	19
2:00	23	37	20	18
3:00	24	40	22	19
4:00	28	45	25	22
5:00	29	39	27	23
6:00	35	43	34	29
7:00	41	57	40	35
8:00	42	60	41	38
9:00	44	70	40	34
10:00	45	60	42	36
11:00	44	59	38	34
12:00	47	61	43	36
13:00	46	61	40	33
14:00	53	69	37	30
15:00	42	64	38	32
16:00	39	57	34	29
17:00	46	65	29	25
18:00	53	70	30	23
19:00	28	47	27	23
20:00	25	38	24	21
21:00	27	51	24	21
22:00	26	39	24	22
23:00	28	40	27	25

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53.4	24.8	46.5	34.7	22.8	30.0
Lmax (Maximum)	69.8	37.8	59.4	55.2	37.3	42.8
L50 (Median)	42.6	23.8	35.2	33.7	19.6	24.5
L90 (Background)	38.2	21.2	30.1	28.9	18.3	21.8

Computed Ldn, dB	45.0
% Daytime Energy	99%
% Nighttime Energy	1%



Appendix B-22  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Thursday, February 02, 2012**

Hour	Leq	Lmax	L50	L90
0:00	46	69	38	35
1:00	45	63	39	35
2:00	42	62	38	32
3:00	42	63	37	34
4:00	47	64	36	32
5:00	55	76	48	38
6:00	56	73	52	41
7:00	59	71	57	49
8:00	61	73	59	51
9:00	59	77	55	47
10:00	59	77	55	47
11:00	58	74	54	45
12:00	56	70	53	45
13:00	55	73	52	45
14:00	66	97	53	47
15:00	57	74	54	47
16:00	57	74	54	47
17:00	59	73	57	50
18:00	58	76	55	48
19:00	56	74	51	44
20:00	58	82	50	42
21:00	55	72	49	43
22:00	53	68	45	40
23:00	50	73	41	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66.4	54.5	59.4	56.0	42.2	51.1
Lmax (Maximum)	97.5	70.2	75.9	76.0	61.5	67.8
L50 (Median)	59.1	49.2	53.9	51.7	36.4	41.5
L90 (Background)	51.1	41.9	46.6	40.7	32.1	36.0

Computed Ldn, dB	60.1
% Daytime Energy	92%
% Nighttime Energy	8%



Appendix B-23  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Friday, February 03, 2012**

Hour	Leq	Lmax	L50	L90
0:00	49	69	39	34
1:00	47	71	37	32
2:00	45	72	35	31
3:00	42	63	37	34
4:00	50	68	42	36
5:00	79	110	51	44
6:00	58	72	54	48
7:00	59	72	57	51
8:00	58	74	56	49
9:00	59	75	56	48
10:00	58	72	58	48
11:00	56	70	52	45
12:00	57	80	52	44
13:00	56	73	53	46
14:00	69	99	52	45
15:00	57	76	54	46
16:00	58	79	55	47
17:00	57	68	56	49
18:00	57	72	54	48
19:00	56	71	52	45
20:00	56	80	49	44
21:00	55	71	50	44
22:00	53	68	47	42
23:00	52	70	44	40

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	68.9	55.4	60.1	78.6	41.6	69.1
Lmax (Maximum)	99.2	68.3	75.4	109.8	62.9	73.6
L50 (Median)	57.7	49.2	53.7	54.3	35.1	42.9
L90 (Background)	51.4	43.7	46.5	47.7	30.7	37.8

Computed Ldn, dB	74.9
% Daytime Energy	17%
% Nighttime Energy	83%



Appendix B-24  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Saturday, February 04, 2012**

Hour	Leq	Lmax	L50	L90
0:00	47	66	41	37
1:00	49	69	39	35
2:00	45	63	36	32
3:00	46	66	38	34
4:00	45	63	39	34
5:00	52	70	45	39
6:00	56	74	48	43
7:00	57	73	52	46
8:00	58	73	54	46
9:00	58	72	55	46
10:00	56	70	54	45
11:00	58	78	53	45
12:00	58	81	53	44
13:00	54	67	51	43
14:00	64	90	52	44
15:00	57	77	54	45
16:00	56	71	54	45
17:00	58	79	55	47
18:00	58	83	54	47
19:00	54	71	50	44
20:00	54	70	49	43
21:00	55	72	49	44
22:00	53	69	48	43
23:00	51	67	44	40

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	63.7	53.9	57.8	55.8	44.7	51.0
Lmax (Maximum)	89.8	66.9	75.2	74.3	63.2	67.5
L50 (Median)	54.8	48.9	52.5	47.8	36.4	41.9
L90 (Background)	47.2	42.7	44.9	43.0	32.4	37.5

Computed Ldn, dB	59.2
% Daytime Energy	89%
% Nighttime Energy	11%



Appendix B-25  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Sunday, February 05, 2012**

Hour	Leq	Lmax	L50	L90
0:00	50	71	41	36
1:00	47	65	40	36
2:00	43	64	37	34
3:00	45	64	37	34
4:00	45	66	37	33
5:00	48	67	41	35
6:00	50	66	44	38
7:00	54	68	48	44
8:00	55	67	51	44
9:00	56	72	52	42
10:00	54	68	51	41
11:00	57	82	51	43
12:00	55	73	52	44
13:00	54	70	51	43
14:00	67	99	52	44
15:00	55	80	51	42
16:00	54	70	50	42
17:00	54	74	49	41
18:00	52	72	46	41
19:00	55	69	52	46
20:00	54	75	49	44
21:00	53	70	47	42
22:00	50	74	42	38
23:00	49	66	42	38

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	67.0	52.2	57.8	49.9	42.7	48.1
Lmax (Maximum)	98.7	67.0	73.8	74.1	63.5	66.8
L50 (Median)	52.0	46.0	50.1	43.8	37.0	40.2
L90 (Background)	45.6	40.8	42.8	37.9	32.5	35.8

Computed Ldn, dB	57.9
% Daytime Energy	94%
% Nighttime Energy	6%



Appendix B-26  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Monday, February 06, 2012**

Hour	Leq	Lmax	L50	L90
0:00	46	64	37	34
1:00	45	67	34	31
2:00	45	68	37	32
3:00	44	64	37	34
4:00	50	69	43	36
5:00	55	69	51	45
6:00	58	74	54	47
7:00	61	74	59	53
8:00	60	73	57	50
9:00	58	73	55	48
10:00	57	71	54	47
11:00	56	70	51	44
12:00	55	70	51	44
13:00	55	72	52	46
14:00	71	101	53	46
15:00	56	74	53	46
16:00	56	74	55	47
17:00	58	73	56	49
18:00	57	70	54	45
19:00	53	69	46	39
20:00	80	110	50	37
21:00	50	69	42	34
22:00	48	67	42	37
23:00	45	62	40	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	80.1	50.2	69.1	57.7	44.4	51.4
Lmax (Maximum)	109.7	69.2	76.2	73.7	61.6	67.0
L50 (Median)	58.7	41.9	52.5	54.2	34.2	41.8
L90 (Background)	53.3	34.2	44.9	47.0	31.1	36.6

Computed Ldn, dB	67.5
% Daytime Energy	99%
% Nighttime Energy	1%



Appendix B-27  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Tuesday, February 07, 2012**

Hour	Leq	Lmax	L50	L90
0:00	43	61	34	31
1:00	41	58	36	33
2:00	36	53	35	32
3:00	41	63	28	25
4:00	49	67	41	29
5:00	52	66	48	41
6:00	56	69	52	44
7:00	61	74	59	52
8:00	62	73	59	52
9:00	60	74	57	48
10:00	57	73	54	45
11:00	58	75	55	46
12:00	58	74	55	45
13:00	55	71	51	45
14:00	65	92	52	45
15:00	59	77	57	49
16:00	60	74	58	50
17:00	60	76	58	51
18:00	58	72	55	46
19:00	56	78	49	42
20:00	55	70	50	41
21:00	55	74	48	40
22:00	52	66	43	38
23:00	46	64	39	36

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65.0	54.7	59.5	56.2	36.5	49.8
Lmax (Maximum)	92.1	70.4	75.1	68.9	52.8	62.9
L50 (Median)	59.4	48.0	54.5	51.8	28.1	39.6
L90 (Background)	51.9	39.6	46.4	43.5	24.6	34.2

Computed Ldn, dB	59.6
% Daytime Energy	94%
% Nighttime Energy	6%



Appendix B-28  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Wednesday, February 08, 2012**

Hour	Leq	Lmax	L50	L90
0:00	47	69	36	32
1:00	46	64	38	34
2:00	45	65	36	33
3:00	45	66	36	32
4:00	50	67	44	37
5:00	56	72	51	45
6:00	57	71	54	48
7:00	60	78	58	52
8:00	60	75	58	52
9:00	69	96	56	48
10:00	58	78	54	47
11:00	57	73	54	48
12:00	56	69	53	47
13:00	55	72	52	46
14:00	73	105	53	46
15:00	57	77	54	47
16:00	58	72	56	49
17:00	59	77	57	49
18:00	57	72	55	48
19:00	56	73	52	44
20:00	60	86	53	46
21:00	56	74	48	42
22:00	54	72	45	40
23:00	50	68	41	36

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	73.5	54.9	64.1	57.3	45.2	52.4
Lmax (Maximum)	104.7	69.1	78.3	72.0	63.6	68.1
L50 (Median)	58.0	48.0	54.1	53.9	36.0	42.4
L90 (Background)	52.5	42.0	47.3	47.6	32.0	37.5

Computed Ldn, dB	63.5
% Daytime Energy	96%
% Nighttime Energy	4%



Appendix B-29  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 5  
 Thursday, February 02, 2012

Hour	Leq	Lmax	L50	L90
0:00	50	78	22	21
1:00	54	81	22	20
2:00	50	81	22	20
3:00	49	79	21	20
4:00	54	79	22	20
5:00	65	84	35	24
6:00	67	84	41	30
7:00	69	86	48	40
8:00	68	86	47	39
9:00	68	83	44	39
10:00	67	83	45	41
11:00	66	88	47	43
12:00	66	84	46	41
13:00	67	83	46	41
14:00	67	87	47	40
15:00	67	89	48	40
16:00	67	83	48	38
17:00	69	85	51	35
18:00	69	87	50	32
19:00	64	83	35	25
20:00	63	84	34	25
21:00	62	83	36	25
22:00	59	82	26	22
23:00	59	82	28	25

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	69.3	62.4	66.9	67.3	48.6	60.9
Lmax (Maximum)	89.1	82.5	84.9	84.2	78.4	81.1
L50 (Median)	51.2	33.5	44.8	41.3	20.9	26.6
L90 (Background)	42.5	24.7	36.3	30.4	20.1	22.6

Computed Ldn, dB	68.9
% Daytime Energy	87%
% Nighttime Energy	13%



Appendix B-30  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 5  
 Friday, February 03, 2012

Hour	Leq	Lmax	L50	L90
0:00	57	84	29	26
1:00	54	81	27	23
2:00	51	81	25	22
3:00	50	79	26	24
4:00	57	81	30	25
5:00	68	86	48	34
6:00	68	84	46	38
7:00	69	86	51	45
8:00	67	84	46	40
9:00	66	88	45	39
10:00	66	84	43	36
11:00	67	86	43	37
12:00	66	84	41	35
13:00	67	85	41	34
14:00	67	84	42	34
15:00	68	91	41	32
16:00	68	87	44	35
17:00	69	87	53	37
18:00	68	85	48	35
19:00	65	83	40	28
20:00	63	84	36	28
21:00	64	87	37	29
22:00	62	85	32	26
23:00	58	80	29	24

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	69.4	63.4	67.0	67.6	49.6	62.2
Lmax (Maximum)	90.8	83.1	85.7	86.0	78.8	82.4
L50 (Median)	52.8	36.5	43.5	47.6	24.9	32.4
L90 (Background)	45.1	27.9	35.0	37.6	22.3	26.8

Computed Ldn, dB	69.7
% Daytime Energy	83%
% Nighttime Energy	17%



Appendix B-31  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 5  
 Saturday, February 04, 2012

Hour	Leq	Lmax	L50	L90
0:00	57	81	28	24
1:00	55	84	26	24
2:00	55	81	26	24
3:00	53	80	26	23
4:00	56	82	27	24
5:00	62	83	33	27
6:00	65	83	40	32
7:00	65	86	42	37
8:00	67	86	44	37
9:00	68	84	45	36
10:00	68	91	44	35
11:00	69	87	44	34
12:00	69	90	44	34
13:00	67	84	46	33
14:00	67	92	44	34
15:00	68	93	42	32
16:00	67	84	42	31
17:00	67	84	46	32
18:00	66	83	43	29
19:00	63	84	35	22
20:00	63	83	38	26
21:00	62	81	37	25
22:00	61	82	27	22
23:00	58	83	27	24

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	69.1	62.2	66.7	64.6	53.2	59.6
Lmax (Maximum)	93.1	80.9	86.2	84.2	80.3	82.2
L50 (Median)	45.8	35.4	42.4	39.5	25.5	28.8
L90 (Background)	37.0	22.5	31.8	31.6	22.4	24.8

Computed Ldn, dB	68.0
% Daytime Energy	90%
% Nighttime Energy	10%



Appendix B-32  
 Santa Margarita Quarry Extension  
 24hr Continuous Noise Monitoring at Site 5  
 Sunday, February 05, 2012

Hour	Leq	Lmax	L50	L90
0:00	57	82	26	23
1:00	54	81	24	22
2:00	51	80	23	21
3:00	42	74	23	21
4:00	49	79	22	21
5:00	58	84	27	23
6:00	59	82	31	26
7:00	61	82	39	34
8:00	66	83	41	36
9:00	65	83	40	34
10:00	66	87	42	31
11:00	68	92	41	31
12:00	68	95	42	32
13:00	68	92	41	29
14:00	66	83	40	29
15:00	67	89	41	31
16:00	64	84	41	30
17:00	64	82	36	26
18:00	62	86	33	21
19:00	65	84	43	29
20:00	63	81	37	27
21:00	60	81	31	25
22:00	56	81	28	24
23:00	59	82	27	23

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	68.3	60.0	65.5	58.8	42.4	55.8
Lmax (Maximum)	94.7	80.8	85.6	84.4	73.6	80.5
L50 (Median)	43.2	30.7	39.2	31.5	22.4	25.8
L90 (Background)	35.7	21.0	29.7	26.3	20.5	22.7

Computed Ldn, dB	65.6
% Daytime Energy	94%
% Nighttime Energy	6%



Appendix B-33  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Monday, February 06, 2012**

Hour	Leq	Lmax	L50	L90
0:00	51	79	25	22
1:00	52	83	23	21
2:00	56	82	24	21
3:00	55	82	24	22
4:00	60	83	29	25
5:00	67	88	44	31
6:00	68	87	47	39
7:00	69	85	53	46
8:00	67	85	51	46
9:00	67	85	46	40
10:00	67	85	44	39
11:00	66	86	42	37
12:00	68	96	42	34
13:00	67	89	43	36
14:00	67	84	47	38
15:00	69	97	47	38
16:00	68	85	49	38
17:00	69	84	51	37
18:00	68	85	45	31
19:00	63	84	35	24
20:00	62	85	34	25
21:00	60	82	35	27
22:00	60	82	36	25
23:00	56	81	37	31

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	69.3	60.3	67.0	67.9	51.0	62.1
Lmax (Maximum)	97.4	81.7	86.4	88.1	78.9	83.0
L50 (Median)	52.5	34.2	44.2	47.2	23.1	32.1
L90 (Background)	46.4	24.4	35.9	38.9	20.8	26.4

Computed Ldn, dB	69.6
% Daytime Energy	84%
% Nighttime Energy	16%



Appendix B-34  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Tuesday, February 07, 2012**

Hour	Leq	Lmax	L50	L90
0:00	52	81	25	23
1:00	57	83	37	31
2:00	49	79	36	28
3:00	48	78	20	19
4:00	58	82	37	20
5:00	65	86	46	35
6:00	66	84	45	37
7:00	70	85	52	44
8:00	68	83	45	39
9:00	67	83	44	36
10:00	66	87	44	37
11:00	67	84	44	36
12:00	66	86	42	34
13:00	67	85	45	35
14:00	66	82	46	38
15:00	66	85	46	39
16:00	67	82	48	39
17:00	68	85	49	31
18:00	66	84	38	28
19:00	64	87	37	31
20:00	62	82	36	32
21:00	62	83	35	26
22:00	61	85	31	27
23:00	57	81	29	25

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	69.5	61.8	66.6	66.4	47.9	61.0
Lmax (Maximum)	87.1	81.5	84.3	86.0	77.7	82.0
L50 (Median)	52.1	34.9	43.4	45.6	20.2	34.0
L90 (Background)	43.5	26.3	34.9	36.5	19.2	27.2

Computed Ldn, dB	68.8
% Daytime Energy	86%
% Nighttime Energy	14%



Appendix B-35  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Wednesday, February 08, 2012**

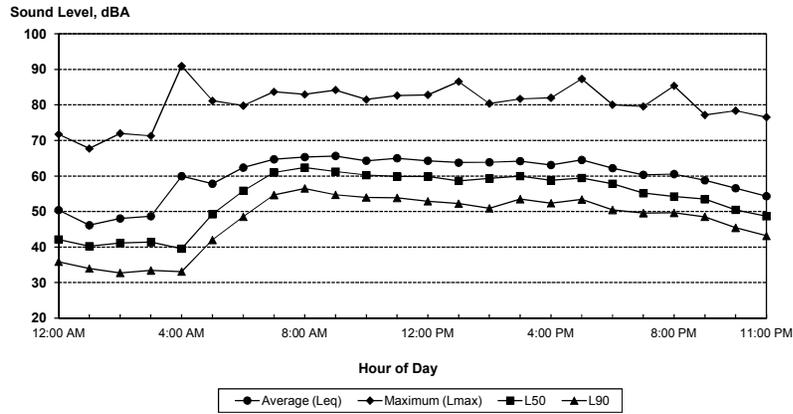
Hour	Leq	Lmax	L50	L90
0:00	54	82	26	23
1:00	57	84	26	22
2:00	47	78	24	21
3:00	50	79	21	19
4:00	60	84	26	22
5:00	68	90	45	28
6:00	68	85	47	34
7:00	70	86	51	43
8:00	68	86	51	44
9:00	67	89	46	40
10:00	67	91	47	41
11:00	67	90	49	43
12:00	65	84	47	42
13:00	68	94	47	42
14:00	67	84	47	41
15:00	70	99	48	42
16:00	68	90	48	39
17:00	69	93	48	35
18:00	68	83	47	33
19:00	64	84	41	36
20:00	63	83	40	35
21:00	60	83	36	32
22:00	60	85	32	26
23:00	57	81	27	24

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	69.8	60.0	67.2	67.7	47.5	62.2
Lmax (Maximum)	98.8	83.3	87.9	89.7	78.1	82.9
L50 (Median)	51.2	36.4	46.2	46.6	21.0	30.5
L90 (Background)	44.5	31.8	39.1	34.2	19.5	24.4

Computed Ldn, dB	69.8
% Daytime Energy	84%
% Nighttime Energy	16%



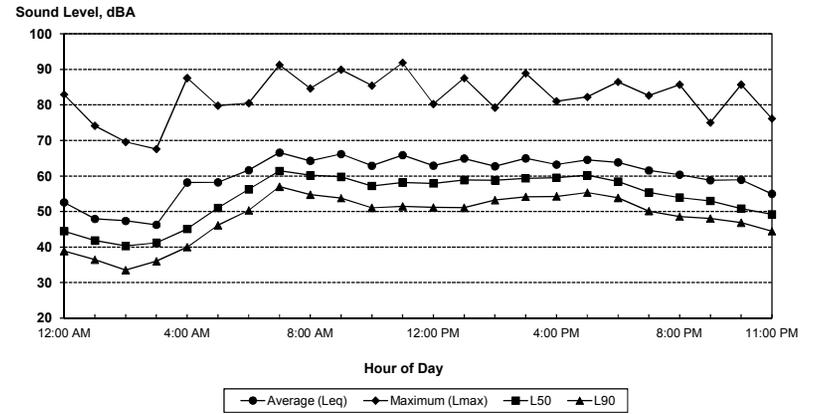
**Appendix C-1**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Thursday, February 02, 2012**



Ldn: 65 dB



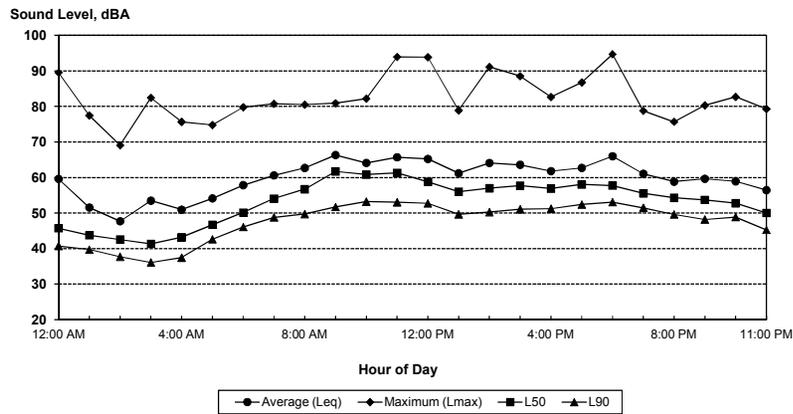
**Appendix C-2**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Friday, February 03, 2012**



Ldn: 65 dB



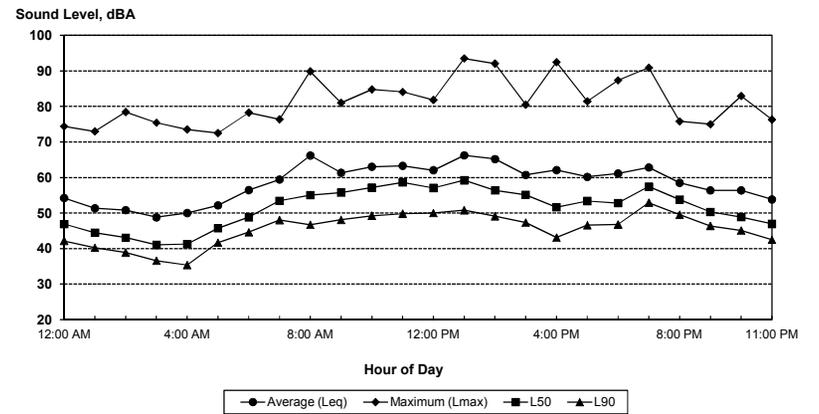
**Appendix C-3**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Saturday, February 04, 2012**



Ldn: 65 dB



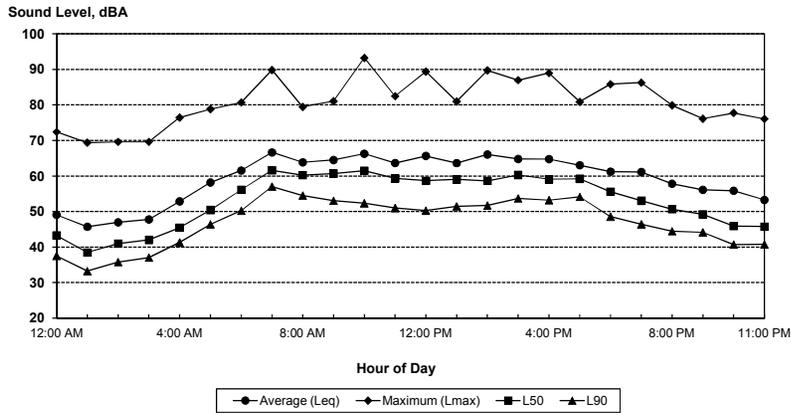
**Appendix C-4**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Sunday, February 05, 2012**



Ldn: 63 dB



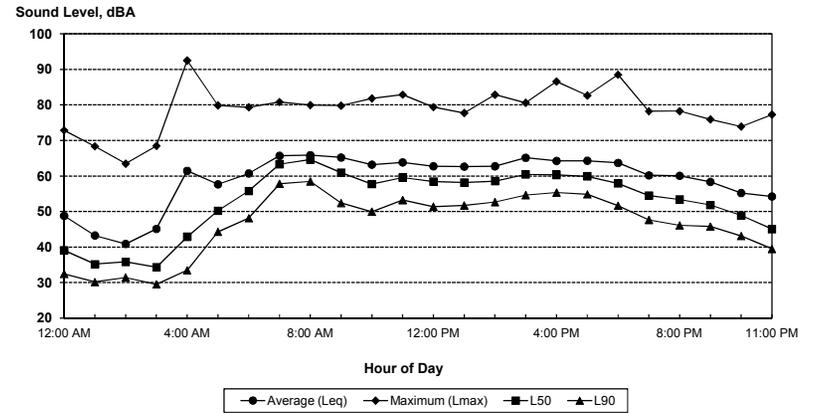
**Appendix C-5**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Monday, February 06, 2012**



Ldn: 65 dB



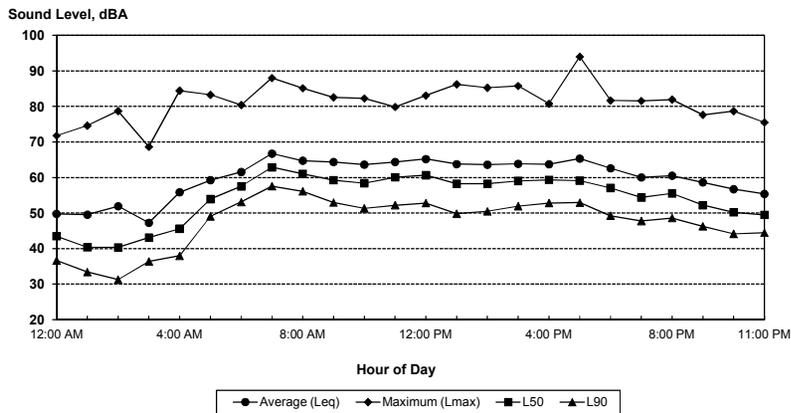
**Appendix C-6**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Tuesday, February 07, 2012**



Ldn: 65 dB



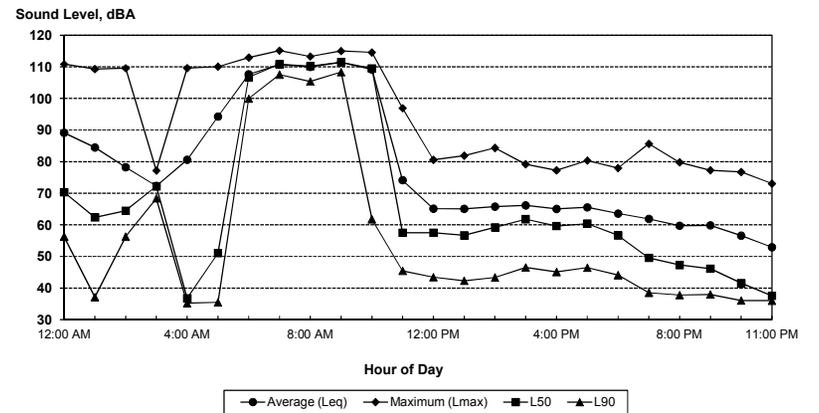
**Appendix C-7**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 1**  
**Wednesday, February 08, 2012**



Ldn: 65 dB



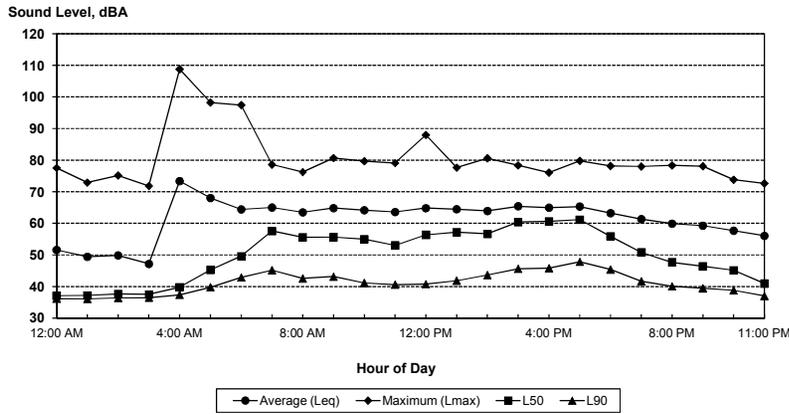
**Appendix C-8**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Thursday, February 02, 2012**



Ldn: 106 dB



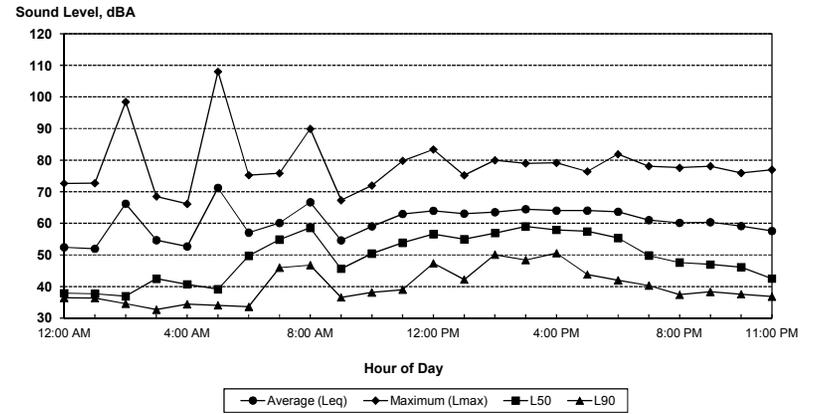
**Appendix C-9**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Friday, February 03, 2012**



Ldn: 72 dB



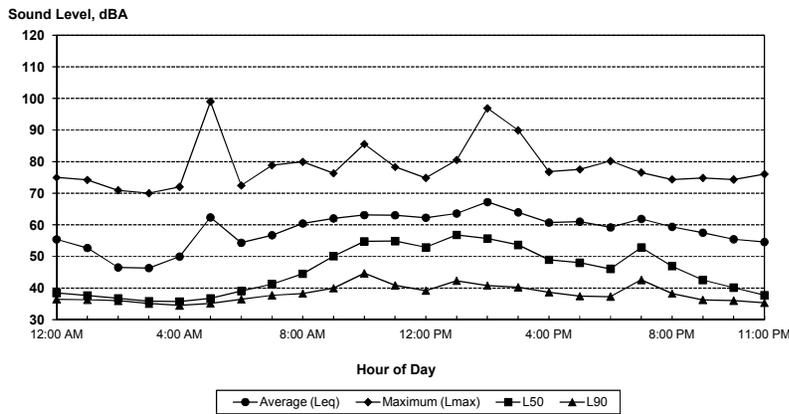
**Appendix C-10**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Saturday, February 04, 2012**



Ldn: 70 dB



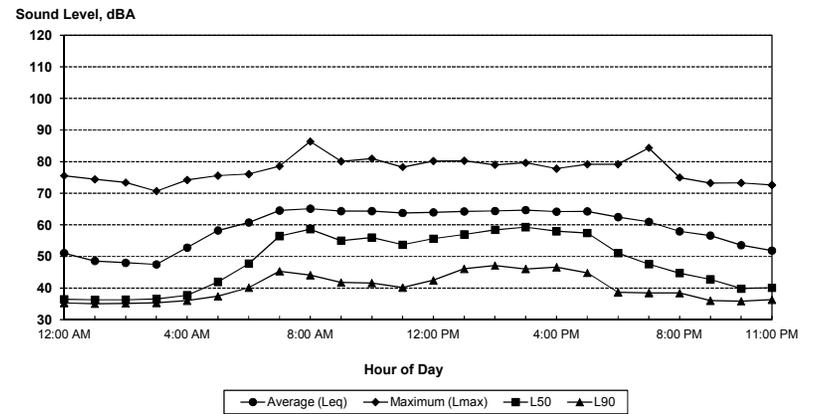
**Appendix C-11**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Sunday, February 05, 2012**



Ldn: 64 dB



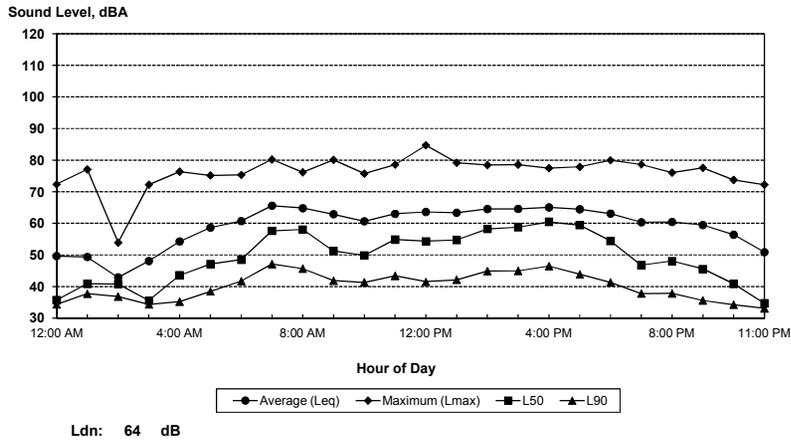
**Appendix C-12**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Monday, February 06, 2012**



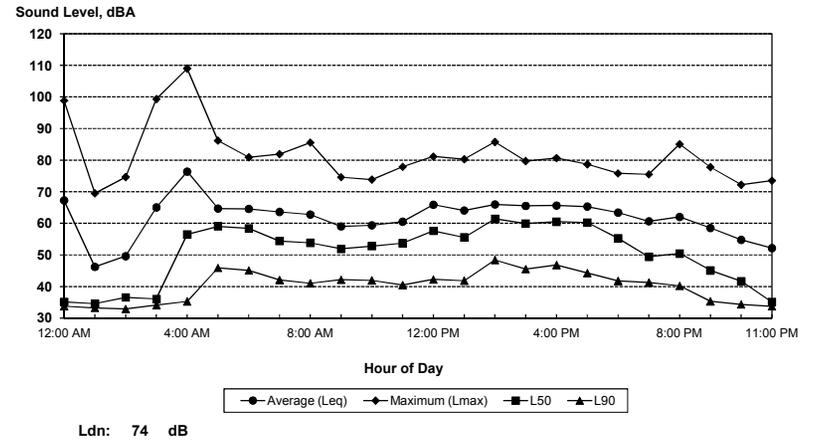
Ldn: 64 dB



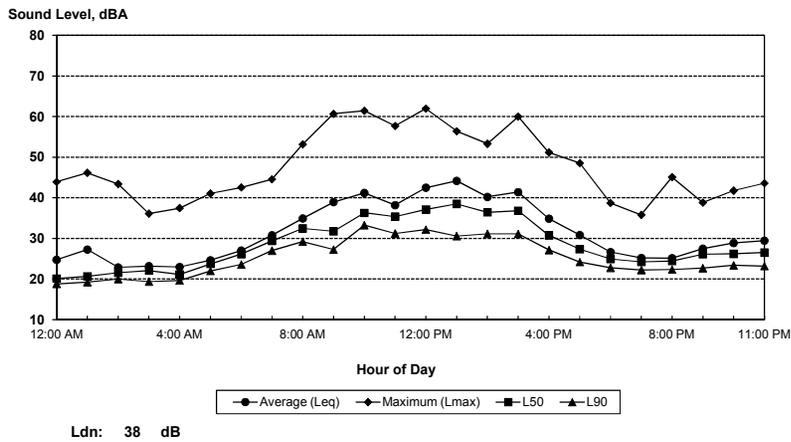
**Appendix C-13**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Tuesday, February 07, 2012**



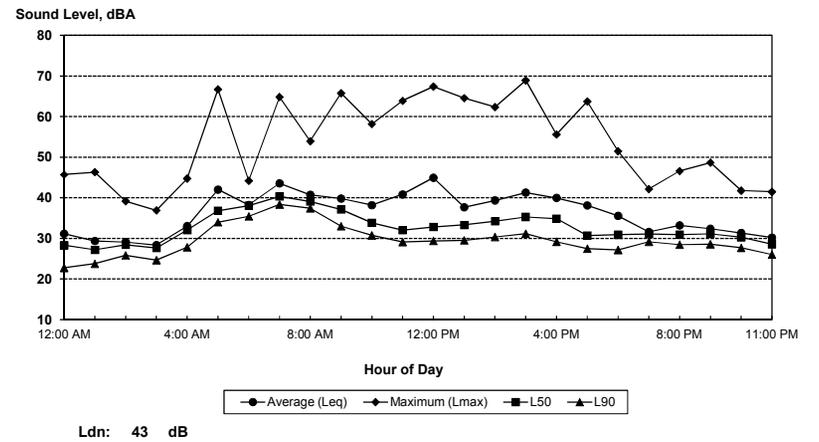
**Appendix C-14**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 2**  
**Wednesday, February 08, 2012**



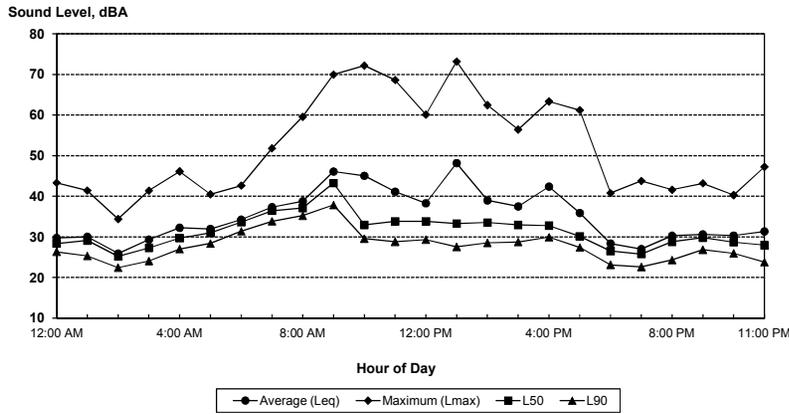
**Appendix C-15**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Thursday, February 02, 2012**



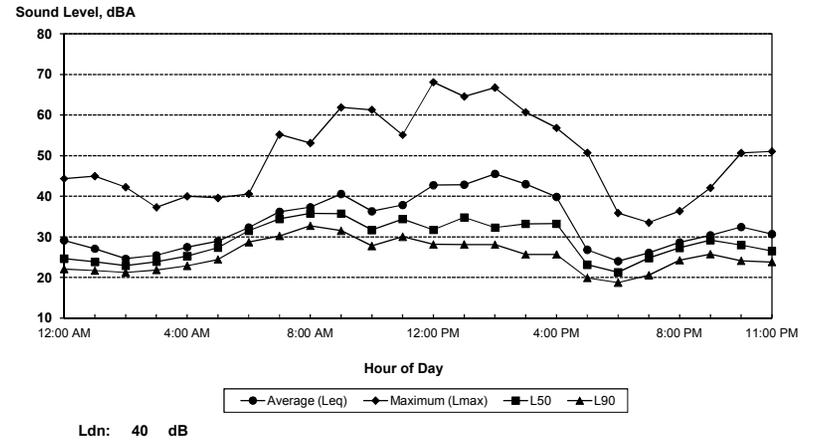
**Appendix C-16**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Friday, February 03, 2012**



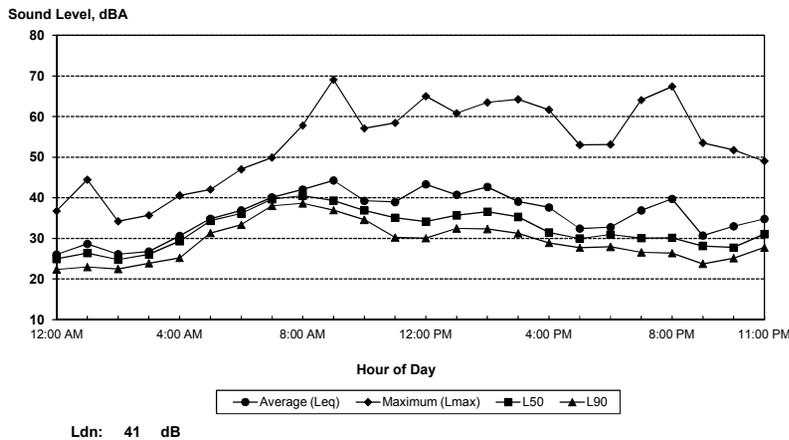
**Appendix C-17**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Saturday, February 04, 2012**



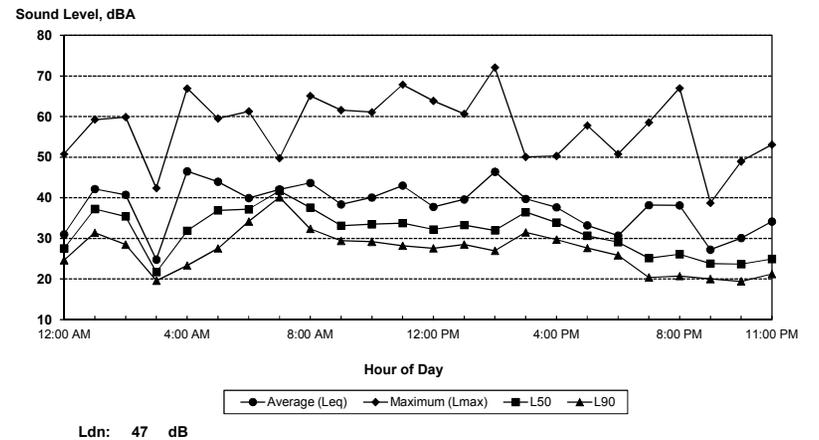
**Appendix C-18**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Sunday, February 05, 2012**



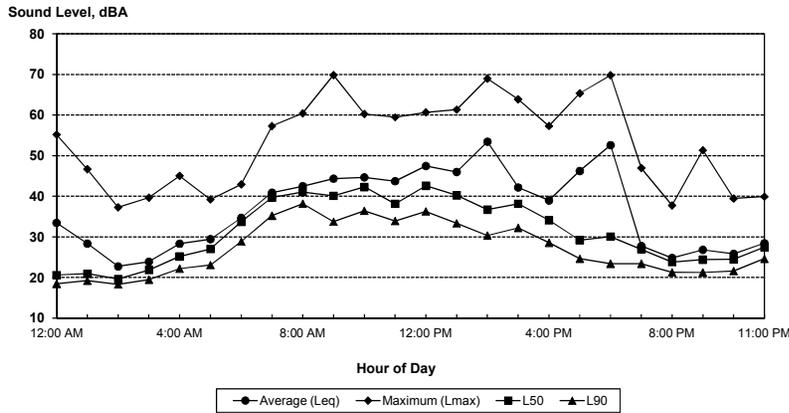
**Appendix C-19**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Monday, February 06, 2012**



**Appendix C-20**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Tuesday, February 07, 2012**



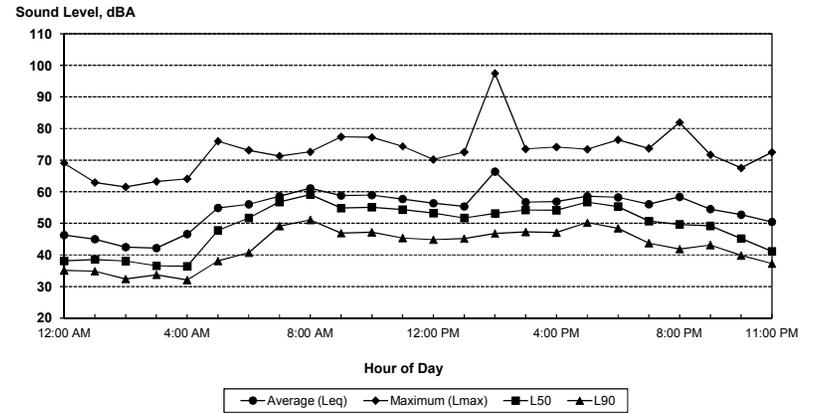
**Appendix C-21**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 3**  
**Wednesday, February 08, 2012**



Ldn: 45 dB



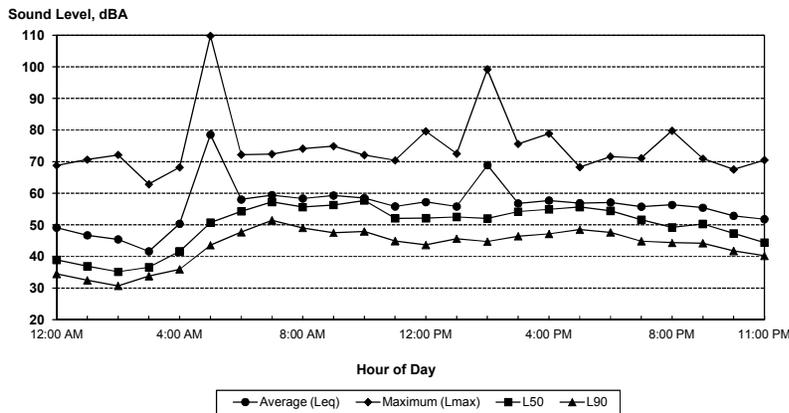
**Appendix C-22**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Thursday, February 02, 2012**



Ldn: 60 dB



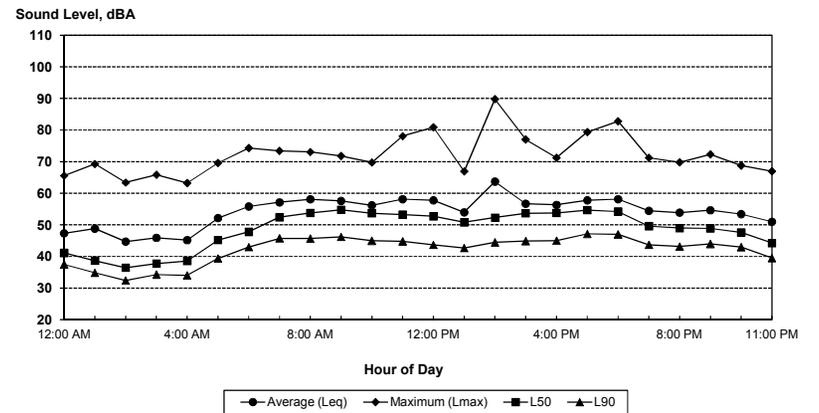
**Appendix C-23**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Friday, February 03, 2012**



Ldn: 75 dB



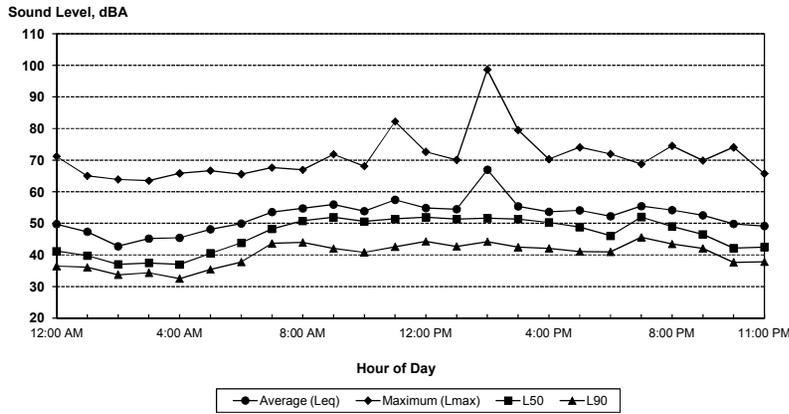
**Appendix C-24**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Saturday, February 04, 2012**



Ldn: 59 dB



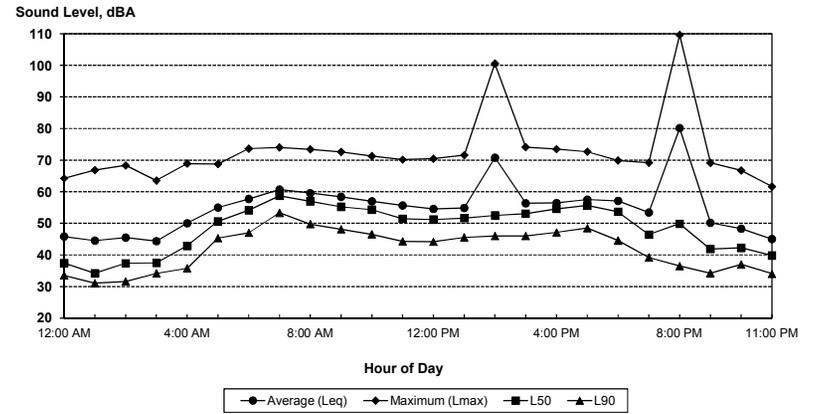
**Appendix C-25**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Sunday, February 05, 2012**



Ldn: 58 dB



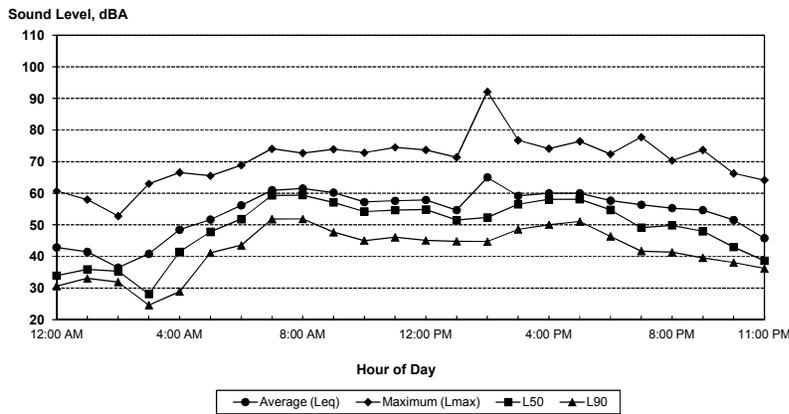
**Appendix C-26**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Monday, February 06, 2012**



Ldn: 67 dB



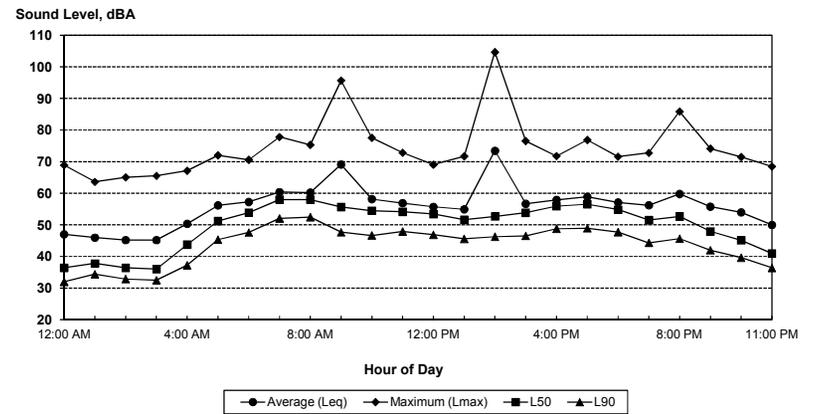
**Appendix C-27**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Tuesday, February 07, 2012**



Ldn: 60 dB



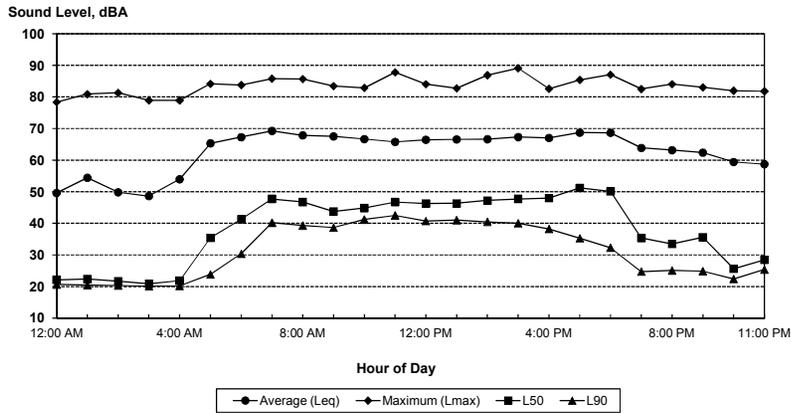
**Appendix C-28**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 4**  
**Wednesday, February 08, 2012**



Ldn: 64 dB



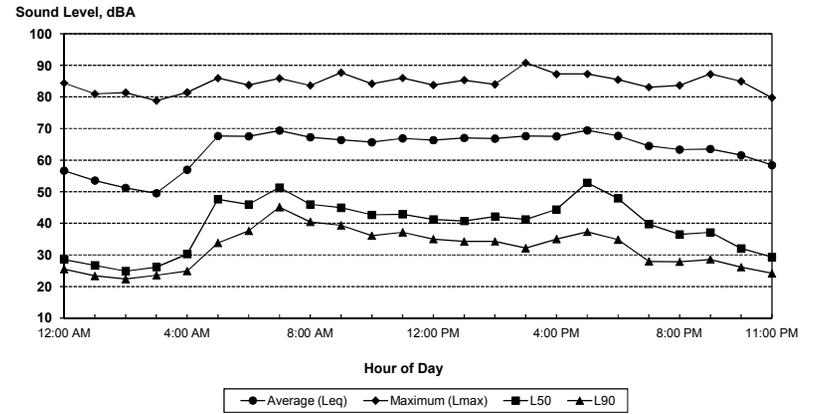
**Appendix C-29**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Thursday, February 02, 2012**



Ldn: 69 dB



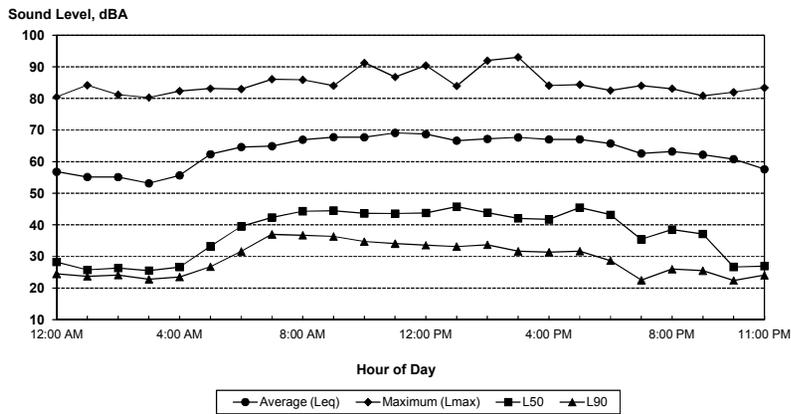
**Appendix C-30**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Friday, February 03, 2012**



Ldn: 70 dB



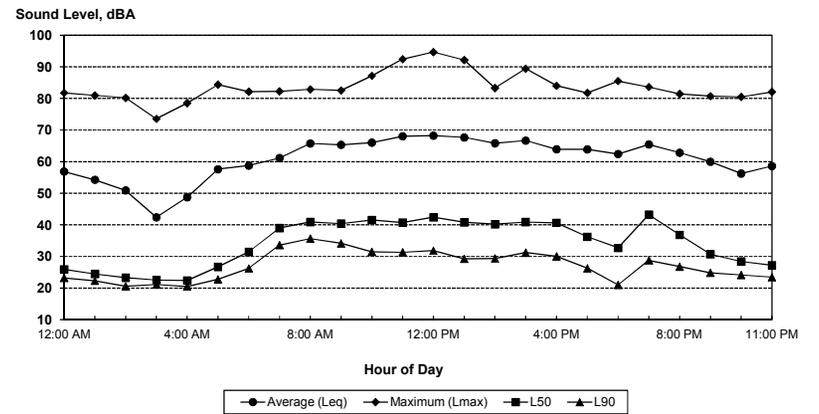
**Appendix C-31**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Saturday, February 04, 2012**



Ldn: 68 dB



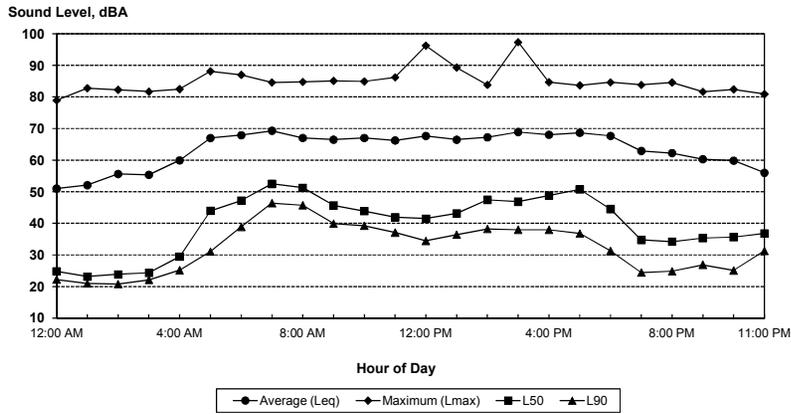
**Appendix C-32**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Sunday, February 05, 2012**



Ldn: 66 dB



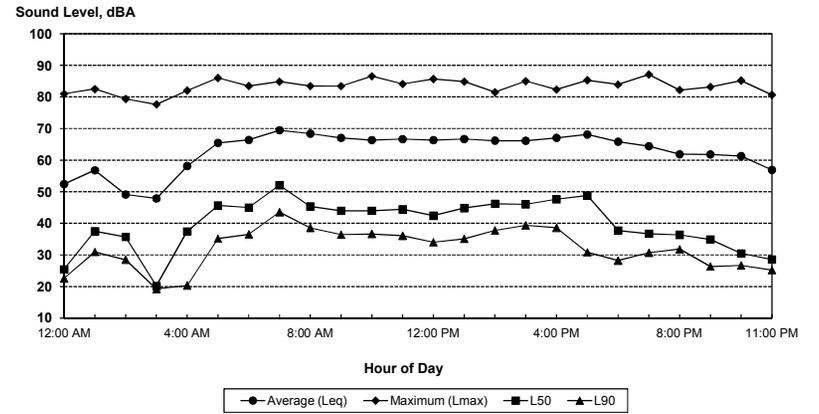
**Appendix C-33**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Monday, February 06, 2012**



Ldn: 70 dB



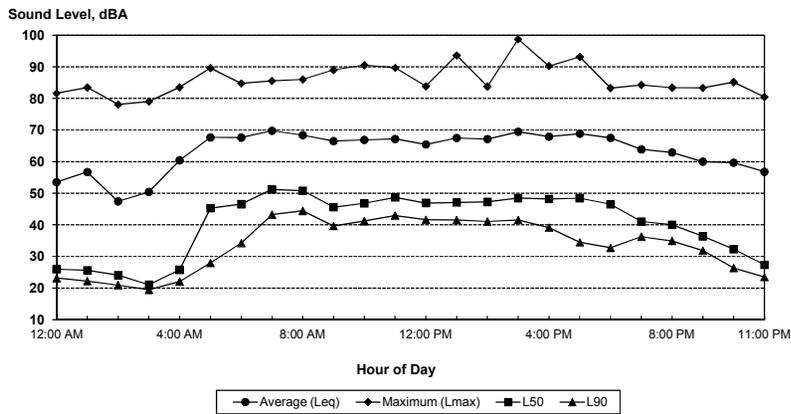
**Appendix C-34**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Tuesday, February 07, 2012**



Ldn: 69 dB



**Appendix C-35**  
**Santa Margarita Quarry Extension**  
**24hr Continuous Noise Monitoring at Site 5**  
**Wednesday, February 08, 2012**



Ldn: 70 dB



**Appendix D-1**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Existing Plus Approved Projects Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 101	n/o Santa Barbara Road	44,300	83		17	2	4	65	100	
2	US 101	Santa Barbara Road - SR 58	42,700	83		17	2	4	65	100	
3	US 101	s/o SR 58	44,000	83		17	2	4	65	100	
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	10,700	83		17	2	4	35	100	
5	El Camino Real	s/o Santa Barbara Road	6,800	85		15	2	4	55	100	
6	El Camino Real	n/o Project Access Road	4,300	85		15	2	4	55	100	
7	El Camino Real	s/o Project Access Road	4,200	85		15	2	4	55	100	
8	El Camino Real	n/o SR 58	4,600	85		15	2	4	55	100	
9	SR 58	Murphy Avenue - Pinal Avenue	8,800	85		15	2	4	55	100	
10	SR 58	El Camino Real - Pozo Road	4,700	85		15	2	4	55	100	
11	SR 58	c/o Pozo Road	2,200	85		15	2	4	55	100	
12	Pozo Road	s/o SR 58	2,600	85		15	2	4	55	100	

**Appendix D-2**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Average Operations Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 101	n/o Santa Barbara Road	132	80		20	0.09	99.9	65	100	
2	US 101	Santa Barbara Road - SR 58	0	80			0.09	99.9	65	100	
3	US 101	s/o SR 58	82	80		20	0.09	99.9	65	100	
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	132	80		20	0.09	99.9	35	100	
5	El Camino Real	s/o Santa Barbara Road	138	80		20	0.09	99.9	55	100	
6	El Camino Real	n/o Project Access Road	138	80		20	0.09	99.9	55	100	
7	El Camino Real	s/o Project Access Road	90	80		20	0.09	99.9	55	100	
8	El Camino Real	n/o SR 58	90	80		20	0.09	99.9	55	100	
9	SR 58	Murphy Avenue - Pinal Avenue	82	80		20	0.09	99.9	55	100	
10	SR 58	El Camino Real - Pozo Road	8	80		20	0.9	99	55	100	
11	SR 58	c/o Pozo Road	8	80		20	0.9	99	55	100	
12	Pozo Road	s/o SR 58	0	80			0.09	99.9	55	100	

**Appendix D-3**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Data Input Sheet**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Peak Operations Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 101	n/o Santa Barbara Road	410	80		20	0.09	99.9	65	100	
2	US 101	Santa Barbara Road - SR 58	0	80			0.09	99.9	65	100	
3	US 101	s/o SR 58	234	80		20	0.09	99.9	65	100	
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	410	80		20	0.09	99.9	35	100	
5	El Camino Real	s/o Santa Barbara Road	418	80		20	0.09	99.9	55	100	
6	El Camino Real	n/o Project Access Road	418	80		20	0.09	99.9	55	100	
7	El Camino Real	s/o Project Access Road	250	80		20	0.09	99.9	55	100	
8	El Camino Real	n/o SR 58	250	80		20	0.09	99.9	55	100	
9	SR 58	Murphy Avenue - Pinal Avenue	234	80		20	0.09	99.9	55	100	
10	SR 58	El Camino Real - Pozo Road	16	80		20	0.9	99	55	100	
11	SR 58	c/o Pozo Road	16	80		20	0.9	99	55	100	
12	Pozo Road	s/o SR 58	0	80			0.09	99.9	55	100	

**Appendix D-4****FHWA-RD-77-108 Highway Traffic Noise Prediction Model****Data Input Sheet**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Cumulative Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)
1	US 101	n/o Santa Barbara Road	46,300	85		15	2	4	65	100	
2	US 101	Santa Barbara Road - SR 58	45,900	85		15	2	4	65	100	
3	US 101	s/o SR 58	47,100	85		15	2	4	65	100	
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	11,900	85		15	2	4	35	100	
5	El Camino Real	s/o Santa Barbara Road	6,900	85		15	2	4	55	100	
6	El Camino Real	n/o Project Access Road	4,500	85		15	2	4	55	100	
7	El Camino Real	s/o Project Access Road	4,400	85		15	2	4	55	100	
8	El Camino Real	n/o SR 58	4,800	85		15	2	4	55	100	
9	SR 58	Murphy Avenue - Pinal Avenue	8,500	85		15	2	4	55	100	
10	SR 58	El Camino Real - Pozo Road	4,500	85		15	2	4	55	100	
11	SR 58	c/o Pozo Road	2,100	85		15	2	4	55	100	
12	Pozo Road	s/o SR 58	2,600	85		15	2	4	55	100	

## Appendix E-1

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

#### Predicted Levels

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Existing Plus Approved Projects Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	US 101	n/o Santa Barbara Road	72.7	62.1	68.6	74
2	US 101	Santa Barbara Road - SR 58	72.6	62.0	68.5	74
3	US 101	s/o SR 58	72.7	62.1	68.6	74
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	58.8	51.8	60.0	63
5	El Camino Real	s/o Santa Barbara Road	62.2	52.6	59.5	64
6	El Camino Real	n/o Project Access Road	60.2	50.6	57.5	62
7	El Camino Real	s/o Project Access Road	60.1	50.5	57.4	62
8	El Camino Real	n/o SR 58	60.5	50.9	57.8	63
9	SR 58	Murphy Avenue - Pinal Avenue	63.3	53.7	60.6	65
10	SR 58	El Camino Real - Pozo Road	60.6	51.0	57.9	63
11	SR 58	c/o Pozo Road	57.3	47.7	54.6	59
12	Pozo Road	s/o SR 58	58.0	48.4	55.3	60

## Appendix E-2

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

#### Predicted Levels

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Average Operations Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	US 101	n/o Santa Barbara Road	8.2	23.9	57.8	58
3	US 101	s/o SR 58	6.1	21.8	55.7	56
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	0.4	19.7	55.3	55
5	El Camino Real	s/o Santa Barbara Road	6.3	22.9	57.3	57
6	El Camino Real	n/o Project Access Road	6.3	22.9	57.3	57
7	El Camino Real	s/o Project Access Road	4.4	21.1	55.5	55
8	El Camino Real	n/o SR 58	4.4	21.1	55.5	55
9	SR 58	Murphy Avenue - Pinal Avenue	4.0	20.7	55.1	55
10	SR 58	El Camino Real - Pozo Road	3.9	20.6	44.9	45
11	SR 58	c/o Pozo Road	3.9	20.6	44.9	45

**Appendix E-3**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Predicted Levels**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Peak Operations Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	US 101	n/o Santa Barbara Road	13.1	28.8	62.7	63
3	US 101	s/o SR 58	10.7	26.3	60.3	60
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	5.4	24.6	60.2	60
5	El Camino Real	s/o Santa Barbara Road	11.1	27.7	62.1	62
6	El Camino Real	n/o Project Access Road	11.1	27.7	62.1	62
7	El Camino Real	s/o Project Access Road	8.9	25.5	59.9	60
8	El Camino Real	n/o SR 58	8.9	25.5	59.9	60
9	SR 58	Murphy Avenue - Pinal Avenue	8.6	25.2	59.6	60
10	SR 58	El Camino Real - Pozo Road	6.9	23.6	47.9	48
11	SR 58	c/o Pozo Road	6.9	23.6	47.9	48

## Appendix E-4

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

#### Predicted Levels

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Cumulative Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	Autos	Medium Trucks	Heavy Trucks	Total
1	US 101	n/o Santa Barbara Road	72.6	62.0	68.5	74
2	US 101	Santa Barbara Road - SR 58	72.6	62.0	68.5	74
3	US 101	s/o SR 58	72.7	62.1	68.6	74
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	59.0	51.9	60.1	63
5	El Camino Real	s/o Santa Barbara Road	62.2	52.6	59.6	64
6	El Camino Real	n/o Project Access Road	60.4	50.8	57.7	63
7	El Camino Real	s/o Project Access Road	60.3	50.7	57.6	62
8	El Camino Real	n/o SR 58	60.7	51.0	58.0	63
9	SR 58	Murphy Avenue - Pinal Avenue	63.1	53.5	60.5	65
10	SR 58	El Camino Real - Pozo Road	60.4	50.8	57.7	63
11	SR 58	c/o Pozo Road	57.1	47.5	54.4	59
12	Pozo Road	s/o SR 58	58.0	48.4	55.3	60

**Appendix F-1**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Noise Contour Output**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Existing Plus Approved Projects Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	US 101	n/o Santa Barbara Road	92	197	425	915	1971
2	US 101	Santa Barbara Road - SR 58	89	192	414	893	1924
3	US 101	s/o SR 58	91	196	423	911	1963
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	15	33	71	154	332
5	El Camino Real	s/o Santa Barbara Road	20	42	91	195	420
6	El Camino Real	n/o Project Access Road	14	31	67	144	310
7	El Camino Real	s/o Project Access Road	14	30	66	141	305
8	El Camino Real	n/o SR 58	15	32	70	150	324
9	SR 58	Murphy Avenue - Pinal Avenue	23	50	108	232	499
10	SR 58	El Camino Real - Pozo Road	15	33	71	152	329
11	SR 58	c/o Pozo Road	9	20	43	92	198
12	Pozo Road	s/o SR 58	10	22	48	103	221

**Appendix F-2**

**FHWA-RD-77-108 Highway Traffic Noise Prediction Model**

**Noise Contour Output**

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Average Operations Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	US 101	n/o Santa Barbara Road	7	15	33	71	154
3	US 101	s/o SR 58	5	11	24	52	112
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	5	11	23	49	105
5	El Camino Real	s/o Santa Barbara Road	7	14	31	66	143
6	El Camino Real	n/o Project Access Road	7	14	31	66	143
7	El Camino Real	s/o Project Access Road	5	11	23	50	107
8	El Camino Real	n/o SR 58	5	11	23	50	107
9	SR 58	Murphy Avenue - Pinal Avenue	5	10	22	47	101
10	SR 58	El Camino Real - Pozo Road	1	2	5	10	21
11	SR 58	c/o Pozo Road	1	2	5	10	21

### Appendix F-3

## FHWA-RD-77-108 Highway Traffic Noise Prediction Model

### Noise Contour Output

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Peak Operations Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	US 101	n/o Santa Barbara Road	15	33	70	152	327
3	US 101	s/o SR 58	10	22	48	104	225
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	10	22	48	104	224
5	El Camino Real	s/o Santa Barbara Road	14	30	64	139	299
6	El Camino Real	n/o Project Access Road	14	30	64	139	299
7	El Camino Real	s/o Project Access Road	10	21	46	98	212
8	El Camino Real	n/o SR 58	10	21	46	98	212
9	SR 58	Murphy Avenue - Pinal Avenue	9	20	44	94	203
10	SR 58	El Camino Real - Pozo Road	2	3	7	16	34
11	SR 58	c/o Pozo Road	2	3	7	16	34

## Appendix F-4

### FHWA-RD-77-108 Highway Traffic Noise Prediction Model

#### Noise Contour Output

Project #: 2011-064 Santa Margarita Quarry Expansion

Description: Cumulative Roadway Analysis

Ldn/CNEL: Ldn

Hard/Soft: Soft

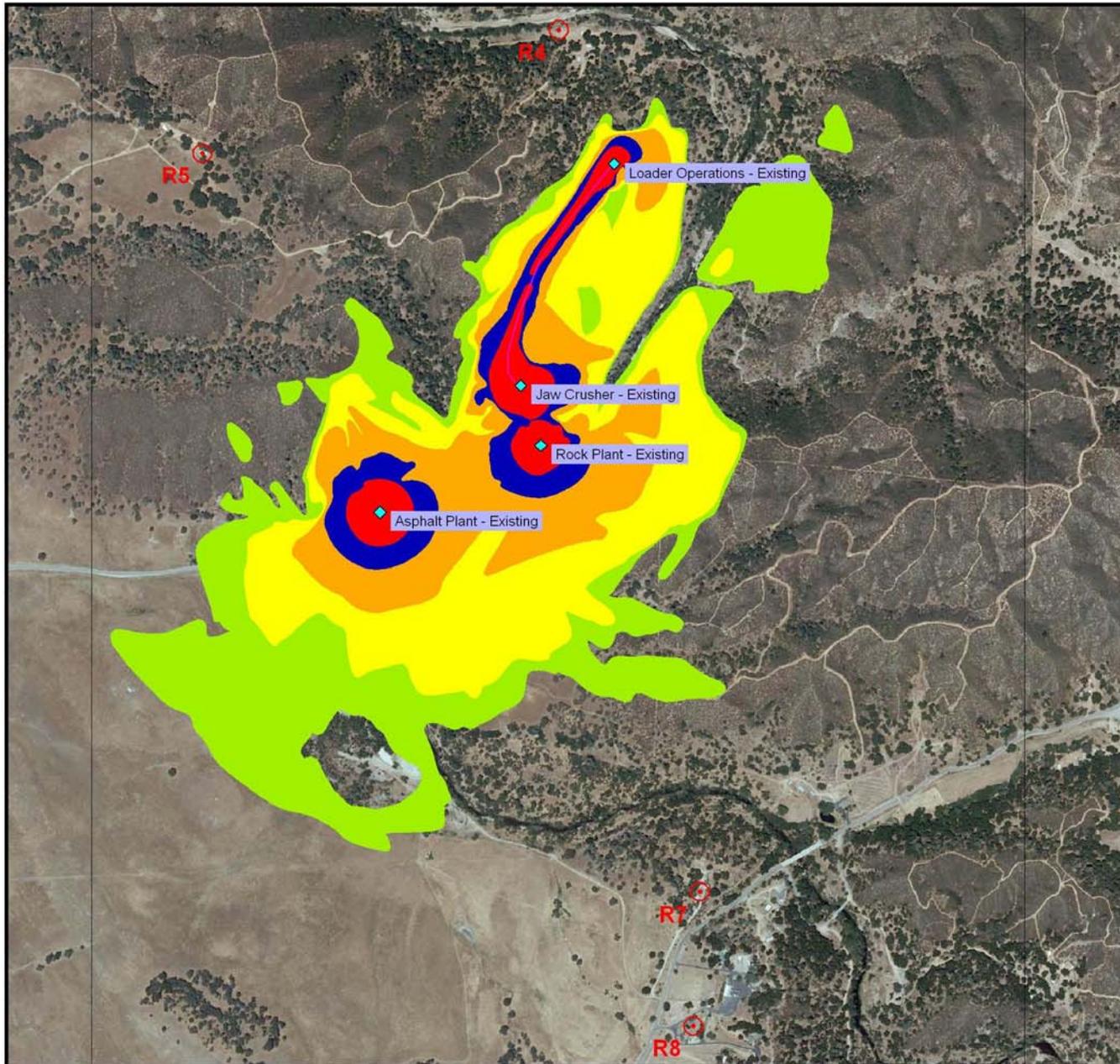
Segment	Roadway Name	Segment Description	----- Distances to Traffic Noise Contours -----				
			75	70	65	60	55
1	US 101	n/o Santa Barbara Road	90	193	416	897	1933
2	US 101	Santa Barbara Road - SR 58	89	192	414	892	1922
3	US 101	s/o SR 58	91	196	421	907	1955
4	Santa Barbara Road	US 101 NB Ramps - El Camino Real	16	34	73	157	339
5	El Camino Real	s/o Santa Barbara Road	20	42	91	197	424
6	El Camino Real	n/o Project Access Road	15	32	69	148	319
7	El Camino Real	s/o Project Access Road	15	31	68	146	314
8	El Camino Real	n/o SR 58	15	33	72	155	333
9	SR 58	Murphy Avenue - Pinal Avenue	23	49	105	226	488
10	SR 58	El Camino Real - Pozo Road	15	32	69	148	319
11	SR 58	c/o Pozo Road	9	19	41	89	192
12	Pozo Road	s/o SR 58	10	22	48	103	221

## Appendix G-1

Santa Margarita Quarry Extension  
 San Luis Obispo County, California  
 Existing Quarry Noise Contours

Notes:

- Based on existing quarry operations



Noise contours created with SoundPLAN 7.0

Hourly Leq, dB  
 in dB(A)

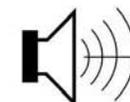


Signs and symbols

-  Receiver
-  Noise Source Location
-  Haul Truck Route



Scale



**BOLLARD**

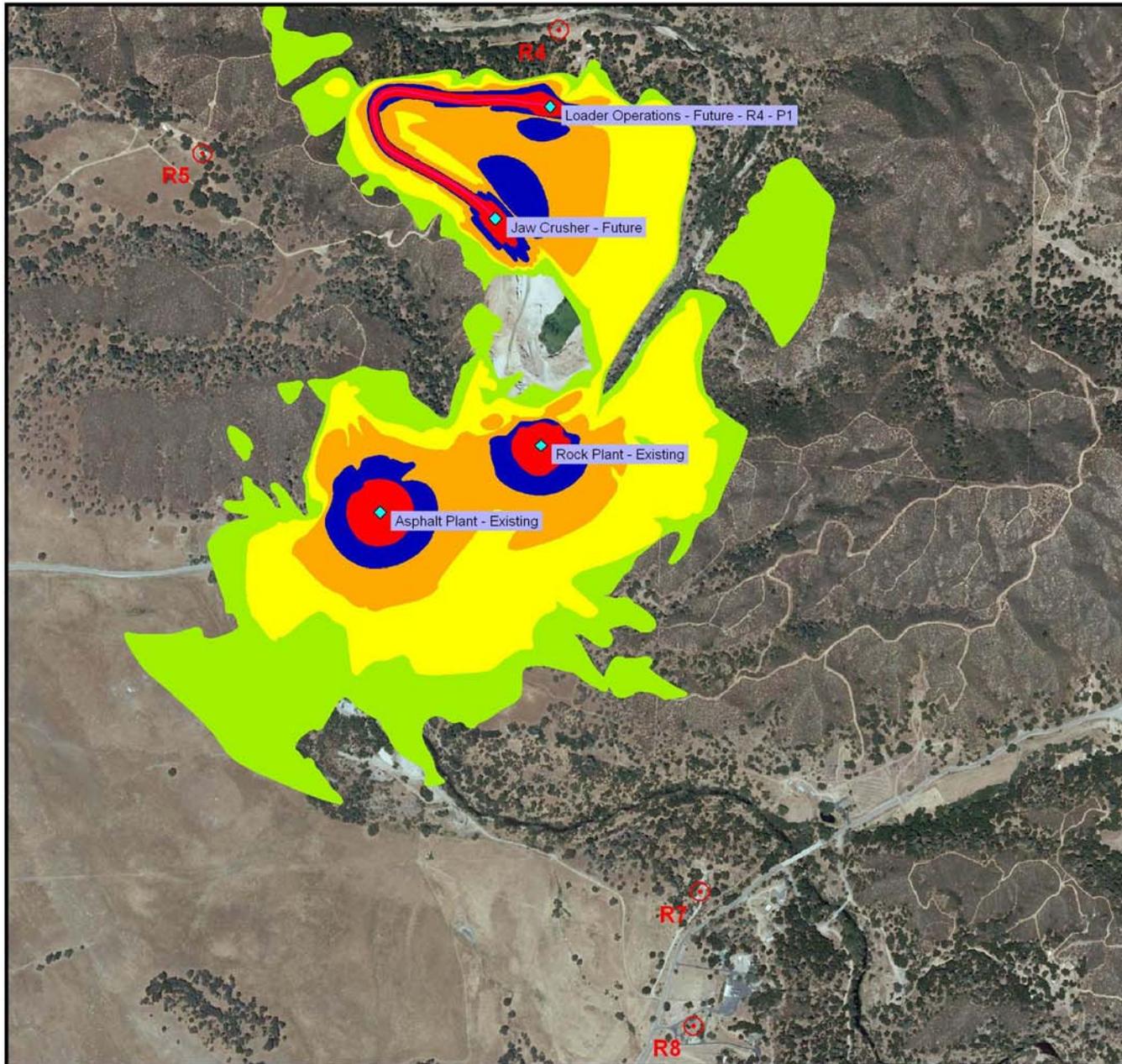
Acoustical Consultants

## Appendix G-2

Santa Margarita Quarry Extension  
 San Luis Obispo County, California  
 Future Quarry Noise Contours

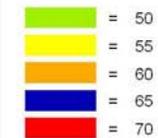
**Notes:**

- Based on future quarry operations taking place nearest to R4



Noise contours created with SoundPLAN 7.0

**Hourly Leq, dB**  
 in dB(A)



Signs and symbols

-  Receiver
-  Noise Source Location
-  Haul Truck Route



Scale



**BOLLARD**

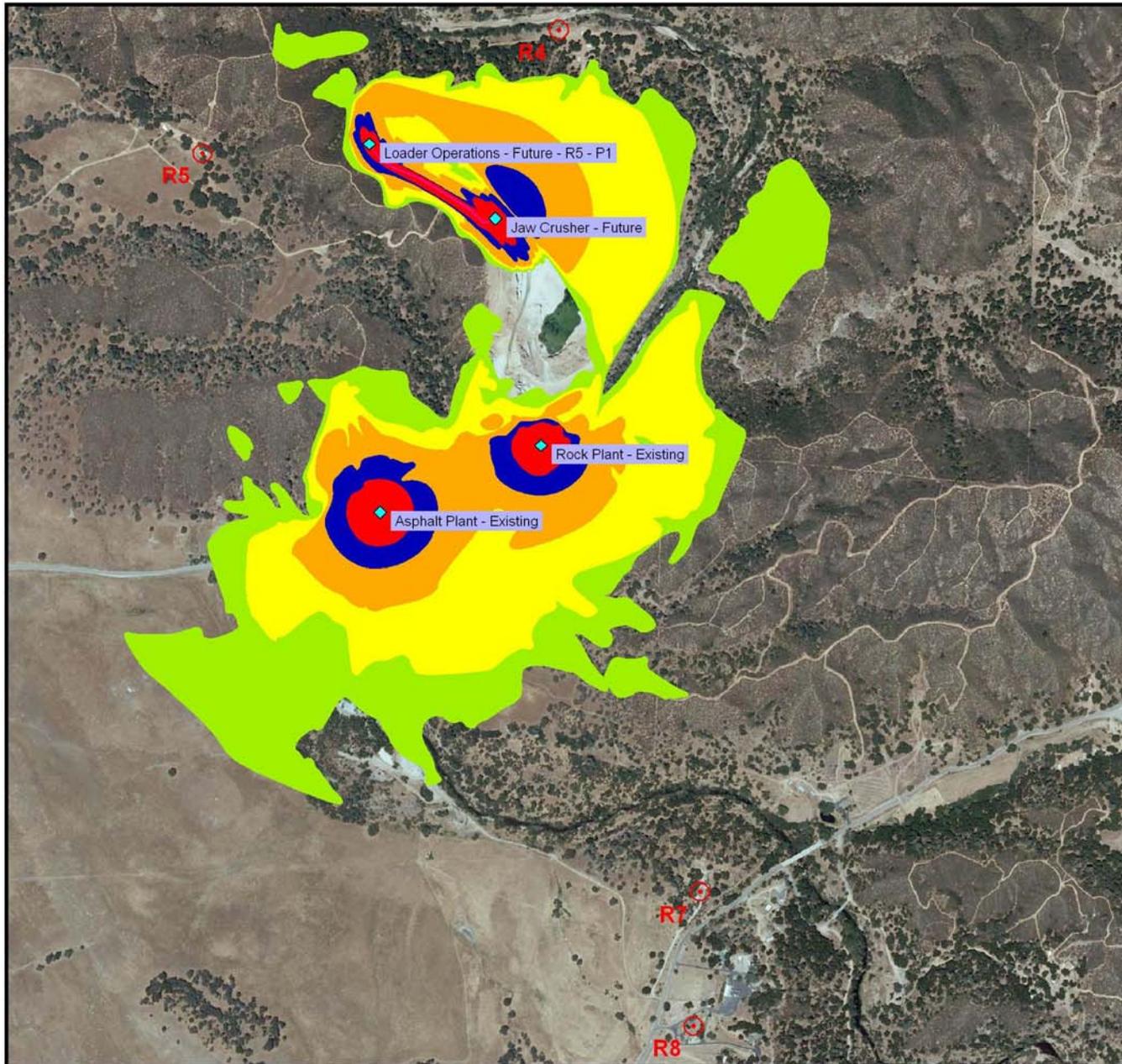
Acoustical Consultants

## Appendix G-3

Santa Margarita Quarry Extension  
San Luis Obispo County, California  
Future Quarry Noise Contours

**Notes:**

- Based on future quarry operations taking place nearest to R5



Noise contours created with SoundPLAN 7.0

**Hourly Leq, dB**  
in dB(A)

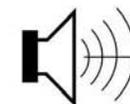


**Signs and symbols**

-  Receiver
-  Noise Source Location
-  Haul Truck Route



**Scale**



**BOLLARD**

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