

# **E&B Oil Development Project**

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City of Hermosa Beach

## **Planning Application**

### **Appendix J**

### **Noise Impact Study**

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**E&B Natural Resources**

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**Behrens and Associates, Inc.**

*Acoustics, Noise and Vibration Consultants*



**Noise Impact Study**

for the

**E&B Oil Development Project**

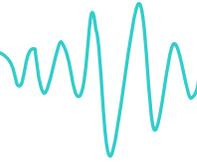
at the

**Hermosa Beach City Maintenance Yard  
555 6<sup>th</sup> Street, Hermosa Beach, CA**

**November 9, 2012**

# **Behrens and Associates, Inc.**

*Acoustics, Noise and Vibration Consultants*



Prepared for:

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November 9, 2012

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- Appendix C - Drilling Quiet Mode Plan
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## 1. INTRODUCTION

### 1.1 Purpose and Study Objectives

The purpose of this study is to identify and analyze the potential noise impacts associated with the proposed E&B Oil Development Project (proposed project) in the City of Hermosa Beach, California. The proposed project consists of the development of an oil drilling and production facility and ongoing operations at the project site, located at 555 6<sup>th</sup> Street, Hermosa Beach, as well as the construction of oil and gas pipelines along alignments that extend into the Cities of Redondo Beach and Torrance.

The following is provided in this report:

- A description of the proposed project and study area;
- Information regarding the fundamentals of noise and vibration;
- A description of the noise standards;
- The existing ambient noise and vibration levels in the project area;
- An analysis of the potential short-term and long-term noise and vibration impacts associated with construction, drilling, production operations and traffic associated with the proposed project.

### 1.2 Project Description

The proposed project is divided into the four development phases outlined below:

#### **Phase 1: Site Preparation** (Duration is approximately six months)

The purpose of Phase 1 would be to prepare the project site for drilling and testing as well as the subsequent phases of the proposed project. Phase 1 would consist of the following activities and improvements:

- Relocation of existing overhead utilities underground along Valley Drive and at the intersection of 6<sup>th</sup> Street and Valley Drive
- Construct redesigned intersection of 6<sup>th</sup> Street and Valley Drive to accommodate larger trucks
- Relocation of the City Maintenance Yard activities to another property selected by the City of Hermosa Beach (this activity will be analyzed by the City)
- Installation of movable temporary 16-foot high sound attenuation wall to reduce the noise generated during demolition and construction
- Clearance of the project site including removal and/or demolition of three onsite buildings, two trailers, storage containers, trash bins, a propane tank, concrete paving and asphalt, fencing, and masonry walls
- Retention of the three of the four existing mature trees along Valley Drive to help screen construction activities from offsite views



- Construction of retaining walls along the entire length of the western property boundary and a small length along 6<sup>th</sup> Street
- Conduct minimal rough grading of the project site to allow for: the construction of a well cellar for three test oil wells and a water injection well; a change in grade to drain towards the well cellar in the event of a spill or rainfall; the movement of the drill rig; and the installation of temporary production equipment
- Installation of a six-foot high temporary perimeter chain link construction fence with green fabric material
- Construction of the well cellar for the three test oil wells and one water injection well
- Installation of underground conduit in Valley Drive from 8<sup>th</sup> Street to the northeast corner of the project site (a distance of 280 linear feet) to allow for the provision of required electrical service by Southern California Edison
- Installation of the necessary electrical equipment on the project site for the drilling and testing of the wells
- Removal of the movable temporary 16-foot high sound attenuation wall
- Installation of temporary landscaping along Valley Drive and 6<sup>th</sup> Street
- Coverage of the ground with crushed aggregate based material to serve as the driving surface that inhibits dust
- Access provided to the project site at a gated entrance on Valley Drive and exit provided via a gated exit on 6<sup>th</sup> Street
- Parking provided on property located adjacent to the southwest corner of the project site
- At the completion of Phase 1, installation of a 32-foot high sound attenuation wall erected inside of the chain link construction fence

## **Phase 2: Drilling and Testing** (Duration is approximately 12 months)

The purpose of Phase 2 would be to conduct the drilling and testing of wells in order to determine the potential productivity and economic viability of the proposed project. Phase 2 would include the following activities and improvements:

- Installation of a temporary construction trailer with associated utilities on the project site
- Delivery and set up of the drill rig and its associated equipment to the project site (drill rig would be electric and equipped with noise attenuation material)
- Installation of temporary oil, water, and gas handling equipment
- Drilling of three test oil wells utilizing directional drilling technology which enables the wells to be drilled laterally for long distances so that the bottom-hole locations may be located several thousand feet from the surface location of the well head on the project site



- Drilling of one water injection well for the reinjection of processed produced water into the oil producing reservoir
- Drilling to occur 24 hours per day, 7 days per week until the appropriate depths and hole-bottom locations have been reached (estimated to be 30 days per well)
- Commence production and testing after the completion of the first test well
- Reinjection of processed produced water into the oil producing reservoir
- Remove drill rig from project site immediately after drilling the four wells
- Trucking of the crude oil to an offsite destination
- Elimination of the produced gas through burning in a gas combustor
- Access provided to the project site at a gated entrance on Valley Drive and exit provided via a gated exit on 6<sup>th</sup> Street
- Parking provided on property located adjacent to the southwest corner of the project site
- If it is determined that the production of oil and gas on the project site would not be economically viable, then E&B would remove the sound attenuation walls, the production equipment, and the temporary construction trailer and abandon the three test wells and the water injection well in accordance with the requirements of the State Division of Oil, Gas and Geothermal Resources. The project site would be left as a clean, graded site with retaining walls, a perimeter chain link fence, and perimeter landscaping.

### **Phase 3: Final Design and Construction** (Duration is approximately 14 months)

If Phase 2 yields the quantity and quality of production that E&B deems economically viable, the proposed project would proceed to Phase 3. The purpose of Phase 3 would be to utilize the production information from Phase 2 to prepare the final design of the facility, prepare the drilling program, procure the equipment, grade the project site, and construct the permanent oil and gas production facilities and other supporting onsite and offsite improvements for the proposed project. Phase 3 would include the following activities and improvements:

- Preparation of the final engineering design of the proposed project based on the findings of the drilling and testing that occurred in Phase 2
- Prior to the construction of the permanent oil and gas production facilities, the temporary production equipment would be removed from the project site
- Removal of the three remaining mature trees along Valley Drive
- Replacement of the 32-foot high sound attenuation wall with a movable 16-foot high sound attenuation wall to reduce the noise generated during construction
- Implementation of the Remedial Action Plan to address the lead and Total Petroleum Hydrocarbon contaminated soil prior to the final grading of the project site (includes export of approximately 9,000 cubic yards of contaminated soil)



- Construction of retaining wall along portions of the eastern and southern property boundary
- Conduct final grading
- Construction of the extension of the first well cellar and the construction of the second well cellar
- Construction of a 16-foot high split-face block wall around the perimeter of the project site with a 10-foot setback along Valley Drive and 6<sup>th</sup> Street to provide an area for landscaping
- Removal of the 16-foot high sound attenuation wall
- Construction of a small office building to house staff and provide facilities for the control and monitoring equipment
- Installation of the permanent oil and gas production equipment
- Installation of permanent site utilities consisting of telephone, water, and sewer
- Construction of the final site improvements related to the site access and paving of the ground surface area
- Construction of street improvements including new curbs, gutters, and sidewalks and installation of landscaping along Valley Drive and 6<sup>th</sup> Street
- Construction of off-site pipelines for transporting the processed oil and gas to their respective buyers
- Start-up of the operation of the permanent oil production equipment and transport of the oil and gas by pipeline to their respective destinations
- Installation of a 32-foot high sound attenuation wall to reduce the noise generated during drilling of the remaining wells that would occur in Phase 4
- Set conductor pipe
- Entrance provided to the project site from an entrance on Valley Drive that is equipped with a motor operated gate setback 70 feet from the roadway to allow for a waiting vehicle to be off Valley Drive
- Exit provided from the project site to 6<sup>th</sup> Street via a motor operated gate
- Parking provided on property located adjacent to the southwest corner of the project site

## **Phase 4: Development and Operations** (Duration is approximately 30-35 years)

The purpose of Phase 4 would be to maximize oil and gas recovery from the reservoir by drilling additional wells and activating the permanent facility for the ongoing operation of the proposed project. The crude oil production for the proposed project would be approximately 8,000 barrels per day. The gas production for the proposed project would be approximately 2.5 million cubic feet per day. Phase 4 would include the following activities and improvements:

- Delivery and set up of the drill rig and associated equipment to the project site (drill rig would be electric and equipped with noise attenuation equipment)



- Drilling of the remaining 27 oil wells and three water injection well (resulting in a total of 30 oil and gas wells and four water injection wells)
- Drilling to occur 24 hours per day, 7 days per week until the appropriate depths and bottom-hole levels have been reached (estimated to be up to 130 weeks)
- Removal of drill rig from project site immediately after completion of drilling the remaining wells
- Removal of the 32-foot high sound attenuation wall from the project site after completion of drilling
- Continued use of entrance, exit, and parking provided in Phase 3
- Conduct ongoing maintenance including workover and well redrill activities

## 1.3 Project Location and Study Area

This report considers the noise produced by:

- Phase 1: Site Preparation –Demolition and construction activities at the Hermosa Beach project site;
- Phase 2: Drilling and Testing – Drilling and testing production activities for up to three oil wells and one water injection well at the project site;
- Phase 3: Final Design and Construction - Construction activities at the project site and pipeline construction activities in the Cities of Hermosa Beach, Redondo Beach, and Torrance;
- Phase 4: Development and Operations - Drilling and long-term production activities for a total of 30 oil wells and four water injection wells at the project site; and
- Road traffic noise on the proposed project’s truck routes in the Cities of Hermosa Beach, Redondo Beach and Torrance.

The location of the project site in Hermosa Beach, and its surrounding land use zones from the City’s Zoning Ordinance, is provided in Figure 1-1. The project site is currently developed as the City Maintenance Yard and the proposed project would require the relocation of this facility to another site or sites as determined by the City. Existing development on the project site consists of three buildings, two trailers, storage containers, sheds, trash bins, a propane tank, concrete paving and asphalt, fencing, and masonry walls. In addition, within the boundaries of the project site, there is an asphalt parking area to the south of the City Maintenance Yard.

The project site is bounded by the following: to the east by Valley Drive, the Veterans Parkway (Hermosa Valley Greenbelt/Trail), Ardmore Park and, further to the east, by Ardmore Avenue and residential development; to the south by 6<sup>th</sup> Street, the City Beach Self Storage facility, light manufacturing land uses and further to the south, South Park and residential development; to the west by light manufacturing land uses, Cypress Street and, Further to the west, residential development; and to



the north by light manufacturing land uses and, further to the north, residential development and 8<sup>th</sup> Street.

**Figure 1-1. Existing Land Use Zones in Project Site Vicinity**



- |   |  |
|---|--|
|  Residential         |  Commercial   |
|  Light Manufacturing |  Project Site |
|  Open Space          |  |

The proposed pipeline alignment scenarios extend south from the project site along Valley Drive to Herondo Street in the City of Redondo Beach. The gas pipeline terminates at a proposed metering station north of N. Francisca Avenue in the Southern California Edison (SCE) Utility Corridor in Redondo Beach. Three oil pipeline alignment scenarios are proposed, all of which extend east on Herondo Street/Anita Street/190<sup>th</sup> Street or the utility corridor to one of four possible valve box locations in the vicinity of the intersection of 190<sup>th</sup> Street and Hawthorne Boulevard or at the Exxon Mobil Refinery



further east on 190<sup>th</sup> Street. These alignment scenarios are located within the Cities of Redondo Beach and Torrance and run adjacent to residential and commercial areas as well as Dominquez Park in Redondo Beach. One route option extends along 190<sup>th</sup> Street and runs adjacent to Columbia Park in Torrance.

The roadways assessed in this study are located within the Cities of Hermosa Beach, Redondo Beach and Torrance. The roadways run through residential and commercial areas in all three Cities and are provided in more detail in Section 7.5.

## 2. NOISE FUNDAMENTALS

Noise is defined as unwanted sound that may be disturbing or annoying. The character of noise is defined by its loudness and its pitch and also by the way the noise varies with time.

Sound is most commonly experienced by people as pressure waves passing through the air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency of the sound. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear span the range from 20 Hz to 20,000 Hz. Towards the lower end of this range are low-pitched sounds, including those that might be described as “rumble” or “boom”. Towards the higher end of the range are high-pitched sounds such as a “screech” or “hiss”.

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include distant traffic, wind in trees, and distant industrial or farming activities, all part of our daily lives. These distant sources create a low-level “background noise” in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment, but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle. Superimposed on this low-level, slowly varying background noise, is a succession of identifiable noisy events of relatively brief duration. These events may include single-vehicle passbys, aircraft flyovers, screeching of brakes, and other short-term events, all causing the noise level to fluctuate significantly from moment to moment.

### 2.1 Noise Descriptors

The following sections describe the noise descriptors that will be used in this study:

#### Decibels

Human perception of loudness is logarithmic rather than linear. For this reason, sound level is usually measured on a logarithmic decibel (dB) scale, which is calculated from the ratio of the sound pressure to a reference pressure level. Specifically, the sound pressure level is calculated as follows:

$$SPL = 20 \log_{10} \frac{p}{p_{ref}}$$



Where:

$SPL$  = sound pressure level in decibels

$p$  = rms sound pressure

$p_{ref}$  = reference sound pressure (20 microPascals)

The reference pressure for sound in the air is 20 microPascals ( $\mu\text{Pa}$ ), which is represented as zero on the decibel scale. This value is used because it approximates the lowest pressure level detectable by a healthy human ear.

## A-Weighting

Humans are more sensitive to some sound frequencies than others. It is therefore common practice to apply an audio filter to measured sound levels, to approximate the response of the human ear. This filter is called the A-weighting filter, which emphasizes sounds between 500 and 5,000 Hz and attenuates the frequencies outside of that range. The resulting measure is the A-weighted decibel, or dBA, which is used almost universally in the assessment of noise impact on humans. Figure 2-1 shows typical noise levels that might be found in both outdoor and indoor environments.

## Equivalent Sound Level ( $L_{eq}$ )

Some sources, such as air-conditioning equipment, produce continuous noise with a steady level that does not change with time. Other sources may be transient in nature, such as a train or aircraft passing-by. Between these two extremes are constant sources that vary gradually with time, such as distant freeway traffic, and intermittent sources that vary rapidly with time, such as traffic on a surface street. A location may receive noise contributions from a number of sources that fall into some or all of these categories, resulting in a complex time-varying noise environment. For this reason, meaningful measurement and analysis of environmental noise usually requires time-dependent noise descriptors. The equivalent sound level, or  $L_{eq}$ , is a sound energy average, calculated over a stated time period. 1-hour, A-weighted  $L_{eq}$  values are used commonly in environmental noise assessments.

## Community Noise Equivalent Level (CNEL)

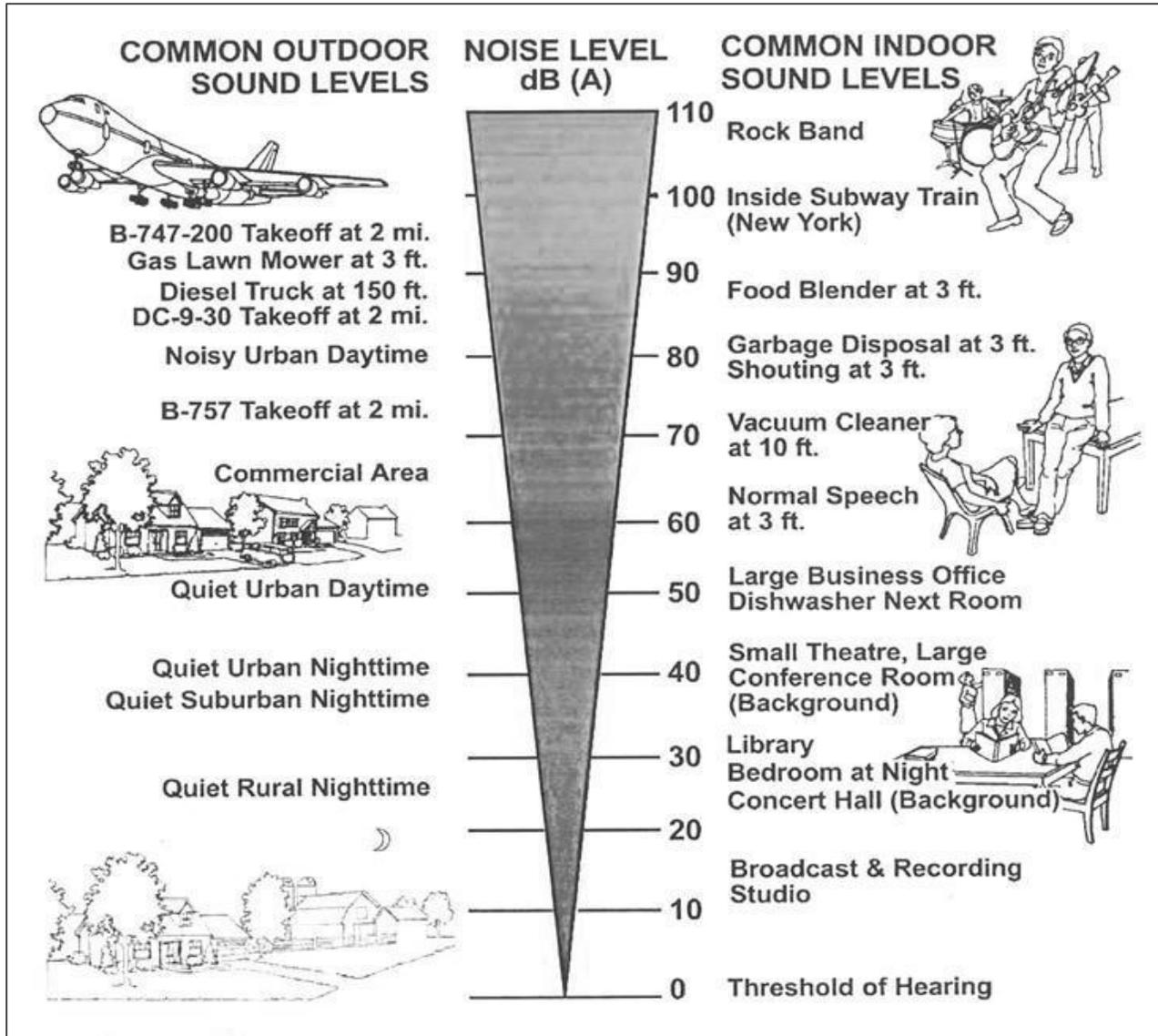
The Community Noise Equivalent Level (CNEL) is an A-weighted average noise level calculated over 24 hours, with a 5 dBA weighting added to sound levels during the evening hours (7 pm to 10 pm) and a 10 dBA weighting added sound levels during the nighttime hours (10 pm to 7 am) to reflect the increased annoyance of noise at night.

## $L_n$

Time-varying noise environments may be expressed in terms of the noise level that is exceeded for a certain percentage of the total measurement time. These statistical noise levels are denoted  $L_n$ , where n is the percent of time. For example, the  $L_{50}$  is the noise level exceeded for 50% of the time. For a 1-hour measurement period, the  $L_{50}$  would be the noise level exceeded for a cumulative period of 30 minutes in that hour.



**Figure 2-1. Typical Indoor and Outdoor A-Weighted Sound Levels**



## Sound Power Level

The sound power level of a noise source is its acoustic output power (the amount of sound energy emitted per unit time). It is expressed in decibels and is measured relative to a reference power level of  $10^{-12}$  Watts. Unlike sound pressure level, sound power level is a characteristic of the noise source itself and is not dependent on distance from the noise source.



## Insertion Loss

Insertion loss is the difference in noise level of a source before and after the implementation of a noise control measure, such as a silencer or enclosure around the equipment, when measured at the same location.

## 3. GROUND-BORNE VIBRATION FUNDAMENTALS

Vibration is acoustic energy transmitted as waves through a solid medium, such as soil or concrete. Like noise, the rate at which pressure changes occur is called the frequency of the vibration, measured in Hz. Vibration may be the form of a single pulse of acoustical energy, a series of pulses, or a continuous oscillating motion.

Ground-borne vibration is the ground motion about some equilibrium position that can be described in terms of displacement, velocity, and acceleration. It can be generated by transportation systems, construction activities, and other large mechanical systems. Vibration motion moves in the X, Y and Z axes, but for the purpose of this report only velocity in the Z (vertical) axis will be evaluated.

The way that vibration is transmitted through the ground depends on the soil type, the presence of rock formations or man-made features and the topography between the vibration source and the receptor location. As a general rule, vibration waves tend to dissipate and reduce in magnitude with distance from the source. Also, the high frequency vibrations are generally attenuated rapidly as they travel through the ground, so that the vibration received at locations distant from the source tends to be dominated by low-frequency vibration. The frequencies of ground-borne vibration most perceptible to humans are in the range from less than 1 Hz to 100 Hz.

When ground-borne vibration arrives at a building, there is usually an initial ground-to-foundation coupling loss. However, once the vibration energy is in the building structure, it can be amplified by the resonance of the walls and floors. Occupants can perceive vibration as motion of the building elements (particularly floors) and also rattling of lightweight components, such as windows, shutters or items on shelves. At very high levels, low-frequency vibration can cause damage to buildings.

### 3.1 Vibration Descriptor

#### Peak Particle Velocity

The peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak amplitude of the vibration velocity. The accepted unit for measuring PPV is inches per second (ips). PPV is appropriate for evaluating the potential for building damage and for evaluating human response to ground-borne vibration. Tables 3-1 and 3-2 describe the typical structural and human response to ground-borne vibration levels.



**Table 3-1. Structure Guideline Vibration Criteria**

Structure and Condition	Maximum PPV (ips)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely Fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structure	0.5	0.3
New residential structure	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event. Continuous/frequent intermittent sources include impact pile drivers, vibratory pile drivers, and vibratory compaction equipment.

**Table 3-2. Human Guideline Vibration Criteria**

Human Response	Maximum PPV (ips)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event. Continuous/frequent intermittent sources include impact pile drivers, vibratory pile drivers, and vibratory compaction equipment.

## 4. EXISTING NOISE ENVIRONMENT

### 4.1 Project Site Ambient Noise Levels

To determine the existing noise levels in the vicinity of the project site, ambient noise level measurements were obtained adjacent to properties near the project site and along the proposed pipeline alignments, truck routes, and other roadways. The following describes the measurement procedures, measurement locations, and results.

A total of twelve 48-hour noise measurements were obtained at locations near the project site. An additional two measurements were obtained near the potential proposed City Maintenance Yard location adjacent to City Hall and one was obtained at the potential proposed City Maintenance Yard location on 1<sup>st</sup> Street (the potential sites for the relocation of the City Maintenance Yard will be analyzed by the City). The measurements were obtained between August 8 and August 30, 2012, with each of the measurements starting on a Tuesday and ending on a Thursday. The locations of these measurements are provided in Figures 4-1 and 4-2.

Table 4-1 provides the existing daytime and nighttime  $L_{eq}$  noise levels and the lowest hourly ambient  $L_{eq}$  and  $L_{50}$  noise levels during the daytime and nighttime periods at the various land uses around the project



site. The prefix ‘S’ has been used to denote the ambient measurement locations associated with the project site. Locations S5 and S14 coincide with measurement locations used for the truck route and pipeline route analysis (denoted with prefix ‘T’). The definitions used in the City of Hermosa Beach Oil Code for daytime and nighttime periods have been applied to maintain consistency with the City standards. Each value in the table has been averaged over the two-day measurement period.

Table 4-2 provides the measured ambient noise levels associated with the various existing land uses near the project site. For land uses represented by two measurement locations, the lowest measured noise levels are assumed to be representative of the entire land use area. This ensures a conservative assessment of the noise levels.

Due to the relatively small variations in noise levels over time during drilling operations, compliance with the Oil Code is determined by assessing drilling noise levels against the  $L_{50}$  noise standard. A comparison of the existing ambient daytime  $L_{50}$  noise levels in Table 4-1 with the allowable levels in the Hermosa Beach Oil Code shows that the daytime  $L_{50}$  noise standard of 50 dBA is exceeded by the existing ambient noise level at the light manufacturing properties to the west and the residential properties to the north and east of the site. The Oil Code states that the allowable noise levels should be increased in 5 dB increments to encompass the ambient noise level. This results in allowable  $L_{50}$  daytime noise levels of 60 dBA at the light manufacturing properties to the west and residential properties to the north, and 55 dBA at the residential properties to the east. There are no adjustments to the noise standards due to existing noise levels at any other locations.

Table 4-1 indicates that the existing nighttime  $L_{50}$  noise levels are below the City’s nighttime Oil Code  $L_{50}$  noise standard of 45 dBA at all locations that have the potential to be impacted by drilling noise (S1 through S12) and, therefore, no correction is applied to the nighttime noise standard to account for the existing ambient noise level. All noise reduction measures for drilling and re-drilling activities must therefore be designed so that drilling activities comply with the 45 dBA nighttime standard.

The ambient noise measurements were conducted with model 2250 sound level meters manufactured by Brüel & Kjaer and SoundPro DL sound level meters manufactured by Quest Technologies. The sound level meters were programmed to continuously measure and calculate hourly sound levels. The instruments were calibrated with a Quest QC-10 calibrator.

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**Table 4-1. Project Site Existing Ambient Noise Measurement Summary**

Location Number	Address	Daytime/Nighttime $L_{eq}$ (dBA)		Lowest Hourly $L_{eq}$ (dBA)		Lowest Hourly $L_{50}$ (dBA)	
		Daytime (8 am to 7 pm)	Nighttime (7 pm to 8 am)	Daytime (8 am to 7 pm)	Nighttime (7 pm to 8 am)	Daytime (8 am to 7 pm)	Nighttime (7 pm to 8 am)
S1	West project site property line	57.5	47.3	55.5	37.8	55.5	37.2
S2	North project site property line	56.9	50.4	54.2	36.5	53.1	35.6
S3	East side project site gate	61.5	55.4	60.2	45.3	54.0	39.4
S4	South side project site fence	67.3	51.4	54.0	43.2	49.2	40.7
S5/T1	6 <sup>th</sup> St. and Cypress St.	59.6	56.3	55.5	43.9	45.7	40.3
S6	634 Loma Dr.	58.1	50.4	52.6	41.0	46.3	40.6
S7	730 Cypress Ave.	55.9	47.2	51.6	34.3	45.9	33.1
S8	526 8 <sup>th</sup> St.	63.3	58.7	61.9	48.2	55.7	40.2
S9	560 8 <sup>th</sup> St.	65.3	59.4	63.3	46.5	59.0	38.3
S10	601 8 <sup>th</sup> St.	65.6	60.6	64.8	48.8	59.9	39.8
S11	600 6 <sup>th</sup> St.	61.2	52.3	58.4	42.1	52.6	39.3
S12	Ardmore Park	53.5	45.6	49.3	37.6	46.6	36.0
S13	SW property line of City Hall	53.4	46.7	49.3	40.5	46.8	39.7
S14/T4	1107 Valley Dr.	64.0	58.3	62.1	47.6	56.6	40.5
S15	929 1 <sup>st</sup> St.	60.9	55.7	57.8	48.3	53.4	47.1



**Table 4-2. Project Site Land Use Existing Ambient Noise Level Summary**

Location	Representative Ambient Measurement Location Numbers	Lowest representative Daytime/Nighttime $L_{eq}$ (dBA)		Lowest Representative Hourly $L_{eq}$ (dBA)		Lowest Representative Hourly $L_{50}$ Noise Level (dBA)	
		Daytime (8 am to 7 pm)	Nighttime (7 pm to 8 am)	Daytime (8 am to 7 pm)	Nighttime (7 pm to 8 am)	Daytime (8 am to 7 pm)	Nighttime (7 pm to 8 am)
Light manufacturing properties to north of project site	S2, S7	55.9	47.2	51.6	34.3	45.9	33.1
Light manufacturing properties to west of project site	S1	57.5	47.3	55.5	37.8	55.5	37.2
Light manufacturing properties to south of project site	S4, S5	59.6	51.3	54.0	43.2	43.9	40.3
Residential properties to north of project site on 8 <sup>th</sup> St.	S8, S9	63.3	58.7	61.9	46.5	55.7	38.3
Residential properties east of Valley Dr.	S10, S11	61.2	52.3	58.4	42.1	52.6	39.3
Residential properties to south of project site on Ardmore Ave.	S12	53.5	45.6	49.3	37.6	46.6	36.0
Residential properties to west of project site on Loma Dr.	S6	58.1	50.4	52.6	41.0	46.3	40.6
Hermosa Valley Green Belt (center)	S12	53.5	45.6	49.3	37.6	46.6	36.0
Hermosa Valley Green Belt (west boundary)	S3	61.5	55.4	60.2	45.3	54.0	39.4



## 4.2 Truck Route and Pipeline Route Ambient Noise Levels

A total of 17 24-hour measurements and nine 20-minute short-term measurements were obtained along the truck routes and pipeline alignments in the Cities of Hermosa Beach, Redondo Beach and Torrance. The locations of these measurements are provided in Figures 4-2 through 4-5. Table 4-3 provides the noise levels measured at each location.

**Table 4-3. Truck and Pipeline Routes Ambient Noise Measurement Summary**

Location Number	Location Description		Daytime $L_{eq}$ (7 am to 10 pm) (dBA)	CNEL (dBA)	20 Min $L_{eq}$ (dBA)
	Address	City			
T1/S5	6th St. and Cypress St.	Hermosa Beach	59.9	61.4	-
T2	531 Herondo St.	Redondo Beach	66.5	68.7	-
T3	426 Anita St.	Redondo Beach	73.2	75.5	-
T4/S14	1107 Valley Dr.	Hermosa Beach	63.4	65.1	-
T5	201 Valley Dr.	Hermosa Beach	63.5	64.0	-
T6	1556 Prospect Ave.	Hermosa Beach	63.3	63.7	-
T7	404 Gentry St.	Hermosa Beach	64.4	65.1	-
T8	752 Pier Ave.	Hermosa Beach	73.1	75.8	-
T9	1213 Owosso Ave.	Hermosa Beach	63.4	66.2	-
T10	1228 Agate St.	Redondo Beach	57.7	60.1	-
T11	5410 W. 190 <sup>th</sup> St.	Torrance	70.6	73.3	-
T12	4777 W. 191 <sup>st</sup> St.	Torrance	64.9	67.2	-
T13	4713 Towers St.	Torrance	69.7	73.4	-
T14	4305 W. 190 <sup>th</sup> St.	Torrance	73.0	75.6	-
T15	4100 W. 185 <sup>th</sup> St.	Torrance	69.6	70.7	-
T16	3625 W. 190 <sup>th</sup> St.	Torrance	75.3	77.6	-
T17	18721 Crenshaw Blvd.	Torrance	69.7	73.4	-
T18	415 Herondo St.	Hermosa Beach	-	-	57.3
T19	2 Hermosa Ave.	Hermosa Beach	-	-	65.7
T20	1231 N. Catalina Ave.	Redondo Beach	-	-	64.9
T21	408 Agate St.	Redondo Beach	-	-	61.9
T22	817 N. Lucia Ave.	Redondo Beach	-	-	54.0
T23	732 N. Paulina Ave.	Redondo Beach	-	-	54.9
T24	801 Anita St.	Redondo Beach	-	-	58.4
T25	1327 Amethyst St.	Redondo Beach	-	-	61.5
T26	5210 Arvada St.	Torrance	-	-	51.9

It is noted that the daytime and nighttime periods defined for the traffic and pipeline noise analysis cover different hours of the day compared to the periods for the project site construction, drilling and production noise analysis. This is because the daytime and nighttime periods for all analyses for activities performed at the project site have been defined so as to match the periods defined in the City's Oil Code. The analysis for the traffic noise and pipeline construction noise uses the definitions of 7 am to 10 pm for the daytime period and 10 pm to 7 am for the nighttime period, which are typical of environmental noise analyses. These definitions are also the same as those in the Redondo Beach



Figure 4-1. Ambient Noise Measurement Locations in Vicinity of Project Site





Figure 4-2. Ambient Noise Measurement Locations on Truck and Pipeline Routes (1)





Figure 4-3. Ambient Noise Measurement Locations on Truck and Pipeline Routes (2)





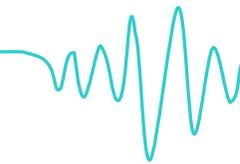
**Figure 4-4. Ambient Noise Measurement Locations on Truck and Pipeline Routes (3)**





Figure 4-5. Ambient Noise Measurement Locations on Truck and Pipeline Routes (4)





and Torrance Municipal Code Noise Ordinances. In addition, they are used in the calculation of  $L_{dn}$  noise levels (usually agreeing within fractions of a decibel with CNEL), which are used for the assessment of community noise impacts for planning purposes in Redondo Beach and Torrance.

## 5. EXISTING VIBRATION ENVIRONMENT

An ambient vibration survey program was completed at the project site to determine the existing vibration environment in the project vicinity. Vibration measurements were performed at all 32 of the locations where the noise measurements were obtained for a period of 20 minutes at each location. The locations of these measurements are provided in Figures 5-1 through 5-5. The results of the ambient vibration measurements are provided in Table 5-1. The results shown are the highest peak particle velocities measured during the 20-minute period.

**Table 5-1. Ambient Vibration Levels Summary**

<b>Location Number</b>	<b>Measured Ambient Peak Particle Velocity (ips)</b>	<b>Location Number</b>	<b>Measured Ambient Peak Particle Velocity (ips)</b>
S1	0.013	T3	0.015
S2	0.001	T5	0.006
S3	0.002	T6	0.004
S4	0.004	T7	0.007
S5/T1	0.002	T8	0.014
S6	0.003	T9	0.007
S7	0.006	T10	0.006
S8	0.006	T11	0.015
S9	0.004	T12	0.006
S10	0.006	T13	0.004
S11	0.015	T14	0.008
S12	0.001	T15	0.013
S13	0.006	T16	0.008
S14/T4	0.002	T17	0.016
S15	0.004	T18	0.007
T2	0.009	T26	0.006

The vibration measurements were obtained with Profound VMS 3-axis vibration monitoring systems.



## **6. NOISE AND VIBRATION STANDARDS AND THRESHOLDS OF SIGNIFICANCE**

### **6.1 City of Hermosa Beach Noise Standards**

#### **6.1.1 City of Hermosa Beach Municipal Code**

The City of Hermosa Beach Municipal Code does not contain quantitative noise standards. However, it contains the following regulations that may apply to the proposed project:

##### **8.24. 030 Prohibited Noises - General Standard.**

Unless otherwise permitted in this Chapter, no person shall make, permit to be made or cause to suffer any noises, sounds or vibrations that in view of the totality of the circumstances are so loud, prolonged and harsh as to be physically annoying to reasonable persons of ordinary sensitivity and to cause or contribute to the unreasonable discomfort of any persons within the vicinity. When considering whether a noise, sound or vibration is unreasonable within the meaning of this section, the following factors shall be taken into consideration:

- A. The volume and intensity of the noise, particularly as it is experienced within a residence or place of business;
- B. Whether the noise is prolonged and continuous;
- C. How the noise contrasts with the ambient noise level;
- D. The proximity of the noise source to residential and commercial uses;
- E. The time of day; and
- F. The anticipated duration of the noise.

##### **8.24. 040 Specific Prohibited Noises.**

Notwithstanding any other provisions of this chapter, the following acts and the causing or permitting thereof, are declared and deemed to be in violation of this chapter:

C. Engines, motors and mechanical devices near residential district. The sustained, continuous or repeated operation or use between the hours of 10:00 p.m. and 8:00 a.m. of any motor or engine or the repair, modification, reconstruction, testing or operation of any automobile, motorcycle, machine, contrivance, or mechanical device or other contrivance or facility unless such motor, engine, automobile, motorcycle, machine or mechanical device is enclosed within a sound insulated structure so as to prevent noise and sound from being plainly audible at the property line of the property from which the sound is emanating.

E. Loading and unloading. Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of



10:00 p.m. and 8:00 a.m. in such a manner as to cause noise disturbance, except for solid waste collection by a franchised collector

## G. Emergency signaling devices.

1. The intentional sounding, or permitting the sounding outdoors, of any emergency signaling device including fire, burglar, civil defense alarm, siren, whistle or similar emergency signaling device, provided, however that testing of an emergency signaling device is permitted between the hours of 10:00 a.m. and 8:00 p.m. Any such testing shall use only the minimum cycle test time. In no case shall such test time exceed sixty (60) seconds. Testing of the emergency signaling system shall not occur more than once in each calendar month.
2. Sounding or permitting the sounding of any exterior burglar or fire alarm unless such alarm is terminated within fifteen (15) minutes of activation.
3. Sounding or permitting the sounding of any motor vehicle alarm unless such alarm is terminated within five (5) minutes of activation.
4. Sounding or permitting the sounding of any motor vehicle alarm more than three times of any duration in any twenty-four (24) hour period.

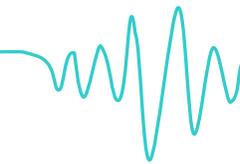
## 8.24. 050 Construction.

### A. Permissible hours of construction.

All construction shall be conducted between the hours of 8:00 a.m. and 6:00 p.m., Monday through Friday (except national holidays), and 9:00 a.m. and 5:00 p.m. Saturdays. Construction activity is prohibited at all other hours and on Sundays and national holidays. For purposes of this section, "construction" or "construction activity" shall include site preparation, demolition, grading, excavation, and the erection, improvement, remodeling or repair of structures, including operation of equipment or machinery and the delivery of materials associated with those activities.

## 6.1.2 City of Hermosa Beach General Plan

The City of Hermosa Beach General Plan Noise Element contains the following table and statements concerning noise levels at various land zones.



## Noise Tolerance Standards

City policy should be geared to the following maximum ambient noise levels:

<b>Zone</b>	<b>Noise Level (dBA)</b>
R-1	45 or below (also schools, hospitals, nurseries and rest homes)
R-2	50 or below (also parks and playgrounds)
R-3	55 or below
C-1	55 or below
C-2/C-3	60 or below
M	65 or below

Maximum traffic noise should be restricted in residential areas to no more than 5 dBA above ambient standard levels. In commercial and manufacturing areas, no more than 10 dBA above ambient standards. Every effort to keep the mean dBA considerably below this should be made.

### 6.1.3 City of Hermosa Beach Oil Code (85-803)

The City's Oil Code (85-803) contains noise limits for drilling operations. The Oil Code provides the standards and criteria that were used to define the thresholds of significance for the assessment of the potential impacts of the proposal project in this study (see Section 6.4 of this report).

Section 21A-6.2 of the Oil Code states:

A. No person, either as owner, agent, or operator, shall conduct any drilling, or redrilling operation at any well in any manner so as to create any noise which causes the exterior noise level when measured at the property line of any single or multiple-family dwelling unit, guest room, commercial building, school, hospital, church or public library to exceed the noise level standards set forth in Table 1. The exterior noise level generated by the drilling or redrilling operation shall be continuously monitored to ensure conformance to the noise level standards. The costs of such monitoring shall be borne by the operator conducting such operation.

**Table 1**

<b>Cumulative Number of Minutes in Any One-Hour Time Period</b>	<b>Noise level standards, dBA</b>	
	<b>Daytime (8 am to 7 pm)</b>	<b>Nighttime (7 pm to 8 am)</b>
30	50	45
15	55	50
5	60	55
1	65	60
0	70	65



No person, either as owner, agent or operator, shall conduct any drilling, or redrilling operation at any time at any well in any manner so as to create any noise which causes a noise level in excess of those limits provided in the Hermosa Beach Municipal Code.

If the existing ambient noise level, exclusive of existing drilling activity, at the nearest adjacent dwelling unit, guest room, commercial building, school, hospital, church or public library property line to the requested oil drilling site does not exceed the permitted nighttime noise levels in Table 1 for any period, then the following regulations shall apply:

1. The only activity permitted between the hours of seven p.m. and eight a.m. will be “on bottom” drilling, with single joint connections. None of the following will be done during the hours of seven p.m. and eight a.m.:
  - a. Hammering on pipe;
  - b. Racking of pipe;
  - c. Acceleration and deceleration of engines or motors;
  - d. Use of drilling assembly rotational speeds that cause more noise than necessary and could reasonably be reduced by use of a slower rotational speed;
  - e. Picking up or laying down drill pipe, casing, tubing or rods into or out of the drill hole.
2. If the measured ambient level exceeds that permissible within any of the first four noise limit categories in Table 1 above, the allowable noise exposure standard shall be increased in five-decibel increments in each affected category as appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to equal the maximum ambient noise level.

Section 21A-6.3 of the Oil Code requires all derricks and noise-producing drilling machines to be enclosed with noise attenuating material. All doors and openings must be kept closed.

## **6.2 City of Redondo Beach Noise Standards**

### **6.2.1 City of Redondo Beach Municipal Code**

Section 4-24.301 of the City of Redondo Beach Municipal Code provides the following quantitative exterior noise standards for stationary noise sources (non-traffic):

The noise standards for the various categories of land use districts identified shall be the higher of either the presumed or actual measured ambient and shall apply to all such property within a designated category as follows:



Receiving Land Use District Category	Time Period	Presumed Ambient Level (dBA)
Low Density Residential R-1-A, R-1, R-2, P-D-R, P-U-D Overlay	10:00 p.m. to 7:00 a.m.	45
	7:00 a.m. to 10:00 p.m.	50
Medium Density Residential R-3, R4, P-D-R, P-U-D Overlay	10:00 p.m. to 7:00 a.m.	50
	7:00 a.m. to 10:00 p.m.	55
High Density Residential R-5, R-6, P-D-R, P-U-D Overlay, C-I	10:00 p.m. to 7:00 a.m.	55
	7:00 a.m. to 10:00 p.m.	60
Commercial NSC, CSC, GC, P-D-C	10:00 p.m. to 7:00 a.m.	60
	7:00 a.m. to 10:00 p.m.	65
Industrial P-D-I	10:00 p.m. to 7:00 a.m.	60
	7:00 a.m. to 10:00 p.m.	65
Industrial P-I	10:00 p.m. to 7:00 a.m.	70
	7:00 a.m. to 10:00 p.m.	70

In addition, Section 4-24.301 states:

- a) Correction for time characteristics. No person shall operate, or cause to be operated, any source of sound at any location within the City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person which causes the noise level when measured on any other property to exceed:
  - (1) The noise standard of the receiving land use district for a cumulative period of more than thirty (30) minutes in any hour; or
  - (2) The noise standard of the receiving land use district plus five (5) dB for a cumulative period of more than fifteen (15) minutes in any hour; or
  - (3) The noise standard of the receiving land use district plus ten (10) dB for a cumulative period of more than five (5) minutes in any hour; or
  - (4) The noise standard of the receiving land use district plus fifteen (15) dB for a cumulative period of more than one minute in any hour; or
  - (5) The noise standard of the receiving land use district plus twenty (20) dB for any period of time.
- b) Levels exceeding the noise limit categories. If the measured ambient level exceeds that permissible as set forth in subsections (1), (2), (3), and (4) of subsection (a) of this section, the allowable noise exposure standard shall be increased in five (5) dB increments as appropriate to encompass or reflect such ambient noise level. In the event the ambient noise level exceeds the noise level set forth in subsection (5) of subsection (a) of this section, the maximum allowable noise level shall be increased to reflect the maximum ambient noise level.



- c) Correction for location of noise source. If the measurement location is on a boundary between two (2) different land use district categories, the noise level limit applicable to the lower land use district category, plus five (5) dB shall apply.
- e) Correction for character of sound. In the event the alleged offensive noise contains a steady audible tone, such as a whine, screech, or hum, or is a repetitive noise, such as hammering or riveting, the standard limits set forth in this section shall be reduced by five (5) dB.

Section 4-24.401 contains the following maximum permissible interior dwelling sound levels:

The following noise standards for various categories of land use presented as follows, unless otherwise specifically indicated, shall apply to all such structures within a designated land use district category with the windows in their normal seasonal configuration:

<b>Receiving Land Use Category</b>	<b>Time Interval</b>	<b>Allowable Interior Noise Level (dBA)</b>
Residential	10:00 p.m. to 7:00 a.m.	40
	7:00 a.m. to 10:00 p.m.	45
School	7:00 a.m. to 10:00 p.m.	45
Hospital and designated quiet areas	Any time	40

- a) Correction for time characteristics. No person shall operate, or cause to be operated, any source of sound at any location within the City or allow the creation of any noise which causes the noise level, when measured inside the receiving structure, to exceed:
  - (1) The noise standard for that land use district category as specified for a cumulative period of more than five (5) minutes in any hour; or
  - (2) The noise standard plus five (5) dB for a cumulative period of more than one minute in any hour; or
  - (3) The noise standard plus ten (10) dB for any period of time.

Section 4-24.503 of the code states:

- a) All construction activity shall be prohibited, except between hours of 7:00 a.m. and 6:00 p.m. on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays and between the hours of 9:00 a.m. and 5:00 p.m. on Saturdays, or the days on which the holidays designated as Memorial Day, the Fourth of July, Labor Day, Thanksgiving Day, Christmas Day, and New Year's Day are observed.



Section 4-24.504 of the code limits vibration, stating:

The operation or permitting the operation of any device which creates vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property, or at 150 feet (forty-six (46) meters) from the source if on a public space or public right-of-way, shall be prohibited. For the purposes of this section, “vibration perception threshold” shall mean the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or the visual observation of moving objects. The perception threshold shall be presumed to be .001 “g’s” in the frequency range from zero to thirty (30) Hz and .003 “g’s” in the frequency range between thirty (30) and 100 Hz.

## 6.2.2 City of Redondo Beach General Plan

The City of Redondo Beach General Plan Noise Element contains the following statement regarding land use compatibility:

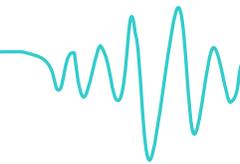
- 10.3.4 Prohibit the development of new industrial, commercial, or related land uses or the expansion of existing land uses when it can be demonstrated that such new or expanded land uses would be directly responsible for causing overall (ambient) noise levels to exceed an Ldn of 65 dB(A) exterior upon areas containing housing, schools, health care facilities, or other “noise-sensitive” land uses (as determined by the City of Redondo Beach).

## 6.3 City of Torrance Noise Standards

### 6.3.1 City of Torrance Municipal Code

The City of Torrance Municipal Code contains quantitative noise standards that apply to stationary noise sources (non-traffic) as well as specific standards for construction activities. Section 46.3.1 states:

- a) It shall be unlawful for any person within the City of Torrance to operate power construction tools, equipment, or engage in the performance of any outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 A.M. to 6:00 P.M. Monday through Friday and 9:00 A.M. to 5:00 P.M. on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. An exception exists between the hours of 10:00 a.m. to 4:00 p.m. for homeowners that reside at the property.
- b) The Community Development Director may allow expanded hours and days of construction if unusual circumstances and conditions exist. Such requests must be made in



writing and must receive approval by the Director prior to any expansion of the hour and day restrictions listed above.

The City of Torrance is divided into four regions with different noise control standards. Section 46.7.2 of the code states:

To provide for methodical enforcement and to give reasonable notice of the performance standards to be met, the foregoing intent is expressed in the following numerical standards. For purposes of this Chapter, the City is divided into regions as set forth in Exhibit A.

a) **Noise Limits on Residential Land.** It shall be unlawful for any person within the City of Torrance (wherever located) to produce noise in excess of the following levels as received on residential land owned or occupied by another person within the designated regions. In addition to the noise limits stated herein, the noise limits set forth in Sec. 46.7.2.b) shall also be complied with.

1. For noise receivers located on residential land, for measurement positions five hundred (500) feet or more distant from the boundaries of Regions 1 and 2, the following limits apply:

Region (in which noise receiver is located)	Noise Level, dB	
	Day	Night
3	50	45
4	55	50

2. For noise receivers located on residential land, for positions within five hundred (500) feet from the boundary of Region 1 or 2, the following limits apply:

Five (5) dB above the limits set forth in Section 46.7.2.a) 1 above, or 5 dB above the ambient noise level, whichever is the lower number.

b) **Noise Limits at Industrial and Commercial Boundaries:**

1. **Noise Sources in Region 1:** It shall be unlawful for any person in Region 1 to produce noise levels at the boundary of Region 1 in excess of 70 dB during the day or 65 dB during the night.

2. **Noise Sources in Region 2:** It shall be unlawful for any person in Region 2 to produce noise levels at the boundary of Region 2 in excess of 60 dB during the day or 55 dB during the night.

3. **Noise Sources in All Remaining Industrial Use Land:** It shall be unlawful for any person on industrial use land outside Region 1 and 2 to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.



4. Noise Sources on All Land Use for Commercial Purposes: It shall be unlawful for any person on land used for commercial purposes to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

In addition to the noise limits set forth herein (Sec. 46.7.2.b), the noise limits set forth in Sec. 46.7.2.(a) shall also be complied with.

- c) Corrections to the Noise Limits: The numerical limits given in Sec. 46.7.2.(a) and (b) shall be adjusted by addition of the following corrections where appropriate.

Noise Conditions		Correction to the limits, decibels
1.	Noise contains a steady, audible tone, such as a whine, screech or hum	-5
2.	Noise is a repetitive impulsive noise, such as hammering or riveting	-5
3.	If the noise is not continuous, one of the following corrections to the limits shall be applied:	
	a) Noise occurs less than 5 hours per day or less than 1 hour per night	+5
	b) Noise occurs less than 90 minutes per day or less than 20 minutes per night	+10
	c) Noise occurs less than 30 minutes per day or less than 6 minutes per night	+15
4.	Noise occurs on Sunday morning (between 12:01 A.M. and 12:01 P.M. Sunday)	-5



**6.3.2 City of Torrance General Plan**

Section 3 of the City of Torrance General Plan Noise Element contains the following land use compatibility guidelines:

**Table N-3**

**Torrance Noise/Land Use Compatibility Guidelines**

Property Receiving Noise		Maximum Noise Level L <sub>dn</sub> or CNEL, dB(A)	
Type of Use	Land Use Designations	Interior	Exterior
Residential <sup>3</sup>	Low Density Residential	45	60/65 <sup>1</sup>
	Low Medium Density Residential		
	Medium Density Residential	45	65/70 <sup>2</sup>
	Medium High Density Residential		
	High Density Residential	45	70 <sup>1</sup>
Commercial and Office	General Commercial	--	70
	Commercial Center		
	Residential Office	50	70
Industrial	Business Park	55	75
	Light Industrial		
	Heavy Industrial		
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	--	70

1. The normally acceptable standard is 60 dB(A). The higher standard is acceptable subject to inclusion of noise-reduction features in project design and construction.

2. Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family Housing.

3. Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dB(A) CNEL.

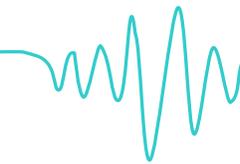
**6.4 CEQA Thresholds of Significance**

Based on the noise and vibration standards discussed above and the California Environmental Quality Act (CEQA) guidelines, a significant impact would have the potential to occur if the proposed project results in 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.

This impact would occur if:

- Noise from drilling or re-drilling operations exceeds the City of Hermosa Beach Oil Code noise standards. This will occur if the drilling noise exceeds the allowable noise levels provided in Table 1 in Section 6.1.3 of this report.



- Noise from production operations exceeds the City of Hermosa Beach Municipal Code noise ordinance. This will happen if engines, motors or mechanical devices are plainly audible at the project site property boundary from 10:00 pm to 8:00 am during production in Phases 2 or 4.
  - The increase in noise level from traffic-generated noise results in an increase of more than 3 dB CNEL or results in an exceedance of the respective Cities General Plan land use compatibility guidelines along the truck routes. This will occur if the increase in noise due to project traffic causes the CNEL to exceed 65 dB at sensitive land uses in the City of Redondo Beach or if it causes the CNEL to exceed the maximum allowable levels in the table in Section 6.3.2 of this report in the City of Torrance.
  - Noise levels due to construction of the pipelines exceed the Municipal Code regulations in the cities through which the pipeline will pass. This will occur if pipeline construction exceeds the noise limits in Section 6.2.1 of the report in the City of Redondo Beach or the noise limits provided in Section 6.3.1 of this report in the City of Torrance.
- Exposure of buildings or persons to excessive ground-borne vibration levels.

This impact would occur if:

- Transient PPV ground-borne vibration levels exceed 0.5 ips at the nearest receptor property line.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

This impact would occur if:

- Noise levels due to construction operations cause the ambient average noise level over the entire daytime period to increase by more than 5 dB or the average noise level over the entire nighttime period to increase by more than 3 dB at sensitive receptors.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

This impact would occur if:

- Noise levels due to production operations cause the lowest ambient average hourly noise level to increase by more than 5 dB during the daytime or 3 dB during the nighttime at sensitive receptors. This threshold of significance is more stringent than for the temporary construction operations and reflects the low noise levels desired for the long-term operation of the project site.



## 7. IMPACTS OF THE PROPOSED PROJECT

Three dimensional computer noise models were created to predict and assess the noise produced at the proposed project site. The noise models were constructed using SoundPLAN version 7.1. This noise model predicts noise levels based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers. The noise model assumes light downwind conditions in all directions. The noise models and analysis are presented in Sections 7.1 through 7.5. The analysis of vibration impacts is presented in Section 7.6.

### 7.1 Phase 1 Site Preparation

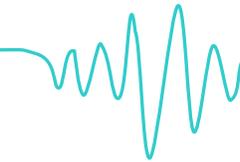
Refer to subsection 1.2 above for the construction activities that would occur during Phase 1. Phase 1 of the proposed project has an estimated duration of 23 weeks. A project schedule and phase schedules are provided in Appendix B. During this time, there will be specific construction stages with various combinations of construction equipment working at the project site. Two of these scenarios were selected for noise modeling. One scenario was selected for the demolition stage and one for construction, with each being representative of the combination of equipment that would generate the highest noise levels during these stages. The modeled noise levels can therefore be considered to represent the typical worst-case conditions. The scenarios selected for noise modeling were:

- Demolition activities associated with removal of the concrete paving, fencing and walls.
- Pumping of concrete for well cellar construction. This work involves several stages of work with various pieces of construction machinery. The loudest stage of this work will involve the use of a concrete truck and concrete pump at the project site.

Table 7-1 shows the equipment in use for each modeled construction scenario. The sound power levels and acoustical usage factors were derived from those for typical public works construction projects and from information supplied by the applicant’s consultants.

**Table 7-1. Sound Power Levels of Phase 1 Construction Equipment**

Equipment	Quantity in model	Sound Power Level (dBA)	Acoustical Usage Factor (%) <sup>1</sup>
<b>Phase 1 Demolition</b>			
Concrete buster	1	121.8	10
Loader	1	110.7	40
Truck	1	111.7	40
<b>Phase 1 Well Cellar Construction</b>			
Concrete pump	1	113.8	20
Concrete truck	1	116.8	40
Notes:			
1. Acoustical usage factor is the percentage of time the equipment is expected to be in operation during the modeled scenario.			



Phase 1 of the proposed project has been designed to incorporate the following noise reduction features during the demolition and construction phases:

1. A 16-foot-high temporary acoustical barrier will be erected around the perimeter of the project site. The temporary barrier will have a sound transmission class (STC) rating of at least 25.
2. No construction activities at the project site will be conducted outside the hours of 8 am to 6 pm from Monday to Friday and 9 am to 5 pm on Saturdays. No construction activities will be conducted on Sundays or federal holidays.
3. All construction equipment will be regularly serviced, in proper working order, and will not create excessive noise. Any equipment that is not compliant will be immediately reported to the site manager and removed from service. Maintenance will be performed only during the hours of 8 am to 6 pm from Monday to Friday and 9 am to 5 pm on Saturdays.
4. All personnel working on the project site will be given Employee Noise Awareness Training to include all noise control procedures and the importance of strict compliance.
5. Horns, whistles, or other loud devices will not be used.
6. Yelling will be avoided. All personnel communications, outside of emergencies, will be over walkie-talkies or other communication devices.
7. No radios or other loud speaking devices will be allowed to be operated/played.
8. All mechanical equipment, including mobile equipment will be switched off when not in use. Vehicles will not be left idling.

The proposed project will comply with the following additional construction noise control measures required by the 1993 Conditional Use Permit:

1. All truck and equipment deliveries will be limited to the hours of 9 am to 3 pm, Monday through Friday.
2. Operation of earthmoving equipment will be limited to daytime hours between 8 am and 6 pm.

Figures 7-1 and 7-2 show the noise contour maps of the two modeled Phase 1 scenarios. The predicted average noise levels at the loudest point at each of the nearby receptor locations for the two analyzed scenarios are provided in Tables 7-2 and 7-3. These noise levels include the incorporation of the noise reduction features defined above and included as a part of the proposed project's operating plan.

The results in Tables 7-2 and 7-3 indicate that the noise levels produced during Phase 1 demolition and construction activities at the project site during the daytime will result in an increase of less than 5 dB to the overall ambient noise level during the daytime hours. No demolition or construction activities would occur during the nighttime. Based on the thresholds of significance defined in Section 6.4 of this report, this short-term increase in noise levels during Phase 1 demolition and construction activities is considered a less than significant impact.



**Table 7-2. Predicted Noise Levels of Phase 1 Demolition Activities**

Location	Average Noise Level (dBA)		Increase in Daytime Noise Level due to Phase 1 Demolition (dB)
	Phase 1 Demolition	Existing Daytime Ambient Level Plus Phase 1 Demolition <sup>1</sup>	
Light manufacturing properties to north of project site	55.5	58.7	2.8
Light manufacturing properties to west of project site	58.0	60.8	3.3
Light manufacturing properties to south of project site	60.6	63.1	3.5
Residential properties to north of project site on 8 <sup>th</sup> St.	55.9	64.0	0.7
Residential properties east of Valley Dr.	56.9	62.6	1.4
Residential properties to south of project site on Ardmore Ave.	52.4	56.0	2.5
Residential properties to west of project site on Loma Dr.	61.0	62.8	4.7
Hermosa Valley Green Belt (center)	55.9	57.9	4.4
Hermosa Valley Green Belt (west boundary)	59.6	63.7	2.2
Notes:			
1. Calculated by adding the predicted Phase 1 demolition noise levels to the existing daytime $L_{eq}$ ambient noise levels in Table 4-2.			

**Table 7-3. Predicted Noise Levels of Phase 1 Well Cellar Construction Activities**

Location	Average Noise Level (dBA)		Increase in Daytime Noise Level due to Phase 1 Construction (dB)
	Phase 1 Well Cellar Construction	Existing Daytime Ambient Level Plus Phase 1 Construction <sup>1</sup>	
Light manufacturing properties to north of project site	53.4	57.8	1.9
Light manufacturing properties to west of project site	60.0	61.9	4.4
Light manufacturing properties to south of project site	60.2	62.9	3.3
Residential properties to north of project site on 8 <sup>th</sup> St.	57.3	64.3	1.0
Residential properties east of Valley Dr.	56.3	62.4	1.2
Residential properties to south of project site on Ardmore Ave.	48.4	54.7	1.2
Residential properties to west of project site on Loma Dr.	60.7	62.6	4.5
Hermosa Valley Green Belt (center)	53.9	56.7	3.2
Hermosa Valley Green Belt (west boundary)	57.1	62.8	1.3
Notes:			
1. Calculated by adding the predicted Phase 1 construction noise levels to the existing daytime $L_{eq}$ ambient noise levels in Table 4-2.			

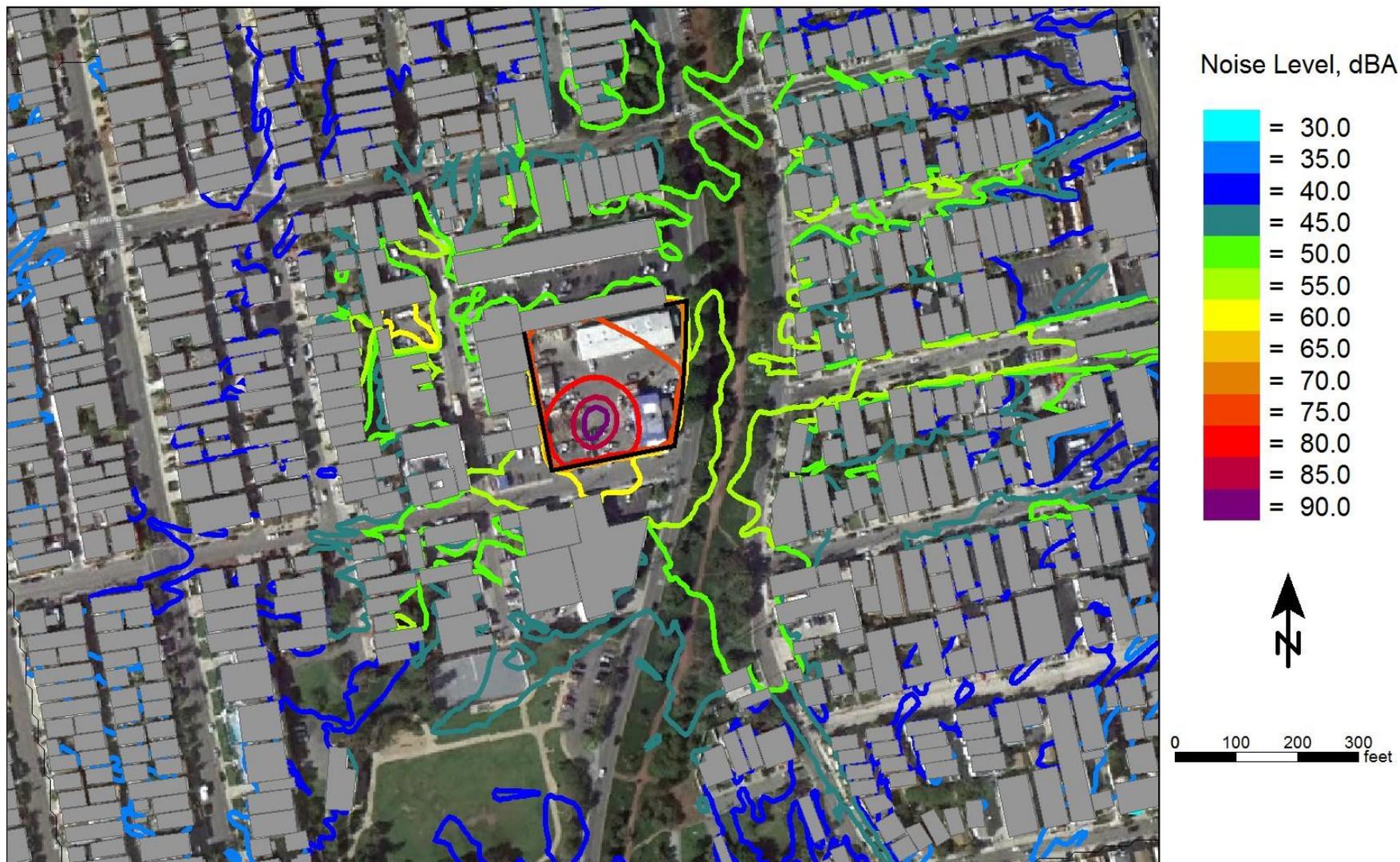


**Figure 7-1. Phase 1 Demolition Noise Levels**





**Figure 7-2. Phase 1 Well Cellar Construction Noise Levels**





## 7.2 Phase 2 Drilling and Testing

Refer to subsection 1.2 above for the activities that would occur during Phase 2. Phase 2 of the proposed project has an estimated duration of 12 months. Refer to Appendix B for the Phase 2 schedule of activities. Drilling activities during Phase 2 will occur 24 hours per day at the project site. The test production equipment in use during this phase will also operate 24 hours per day and will continue to operate after completion of the test well drilling operation. Therefore, two scenarios for Phase 2 were analyzed. The first is for drilling and short-term testing production activities together (including all equipment listed in Tables 7-4 and 7-5) and the second is for test production only (including only the equipment in Table 7-5).

The drilling equipment sound power levels used in this analysis are derived from measurements conducted for an electric top drive drilling rig, operating near Bakersfield, that would be similar to the electric drill rig that will be used for the proposed project. The various noise sources were measured to determine their noise level and frequency spectrum characteristics. The sound power levels and quantities of equipment used in the noise model are provided in Table 7-4.

**Table 7-4. Sound Power Levels of Drilling Equipment**

Equipment	Quantity in model	Sound Power Level (dBA)
Hydraulic Power Unit	1	110.7
Mud Pump	2	105.4
Drill rig top drive	1	93.3
Shaker	3	75.3

Table 7-5 provides the sound power levels assumed for the production equipment in Phase 2. These sound power are derived from sound level measurements obtained at PXP's Murphy production site in the City of Los Angeles as well as published sound level data and frequency spectra of equivalent equipment. The Murphy site was selected for the collection of noise data due to its similarities to the project site in terms of its size and types of equipment used. Noise level data from PXP's Murphy site was used in both the test production analysis of Phase 2 and the Phase 4 long-term production analysis discussed in Section 7.4 below.

**Table 7-5. Sound Power Levels of Test Production Equipment**

Equipment	Quantity in model	Sound Power Level (dBA)
Well pumps	3	97.7
Produced oil pumps	1	77.7
Produced water pumps	1	86.7
Loading pumps	1	86.7
Water booster pumps	1	86.7
Water injection pumps	1	96.8
Vapor recovery compressor	1	93.6
Vapor recovery unit cooler	1	90.2
Variable frequency drive cabinets	3	83.3



Phase 2 of the proposed project has been designed to incorporate the following noise reduction features for the drilling equipment:

1. A 32-foot-high acoustical barrier wall will be erected around the perimeter of the project site during all drilling activities. The wall will have a sound transmission class (STC) rating of at least 32.
2. The air inlets and vents of the hydraulic power unit will be fitted with silencers having an insertion loss of at least that provided in the table below:

Octave Band Center Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Insertion Loss (dB)	4	8	18	31	38	38	31	18

3. An acoustical shroud will enclose three sides of the rig mast to reduce the top drive noise.
4. The mud pumps will be enclosed with acoustical barriers having a sound transmission class (STC) rating of at least 25.
5. An 8-foot high acoustical barrier with an STC rating of at least 25 will be installed around the shaker tables.
6. In order to reduce the possibility of noise disturbances during the nighttime hours to the nearby residents, the 'Drilling Quiet Mode Plan', provided in Appendix C of this report, will be implemented at the drill site during the nighttime hours. This plan provides engineering noise control measures to reduce the possibility of metal-on-metal impact sounds associated with the rig as well as administrative noise control measures to help the rig workers minimize noise at the project site.

Phase 2 of the proposed project has been design to be in compliance with the following drilling and production equipment noise control measures provided in the 1993 Conditional Use Permit:

1. Heavy/large reciprocating equipment shall be mounted on vibration isolators.
2. Pumping units shall be maintained to eliminate noise from worn parts.
3. Tripping will be restricted to daylight hours only.
4. Loudspeaker paging systems shall be prohibited.
5. Well workover rigs or any other rig that is used shall be operated only between the hours of 8:00 am and 6:00 pm during daytime weekday hours only, excluding holidays, except in an emergency as defined in the CUP and reported to the City in accordance with the notification requirement. The exhaust and intake of the diesel engine (if used on the workover rig) shall be muffled to reduce noise to an acceptable limit. The operator shall use whatever means necessary, including but not limited to, enclosing the diesel engine and rig in acoustic blankets or housing.
6. All oil maintenance equipment, vehicles and non-electrical motors shall be equipped with manufacturer approved mufflers or housed in a sound-proofing device.



7. Noise monitoring shall be conducted under the supervision of an independent certified acoustical engineer paid for by the permittee. Reports shall be submitted to the Planning Director within three working days after the completion of each phase of the monitoring. The monitoring shall include the following:
  - a. Pre-drilling phase monitoring. Prior to the start of the drilling phase, noise measurements shall be obtained during the operation of the specific drilling rig which has been selected and the measurements shall be related to those experienced at the nearest residential boundaries to the drilling site. In addition, the noise control measures which have been (or will be) applied to the rig as needed for compliance with the City of Hermosa Beach noise ordinances shall be identified.
  - b. Start of Drilling. Noise measurements shall be obtained during the nighttime hours (10:00 pm to 7:00 am) for at least six hours on each of the three nights within the five day period from the start of the drilling phase. Monitoring is to occur at the nearest residential boundary to the actual drilling operation.
  - c. During the drilling phase. Noise monitoring shall occur during the six-hour period between the hours from 10:00 pm to 7:00 am at least once each month during the drilling phase of the project. The noise level data obtained shall be compared to the City of Hermosa Beach Noise Ordinance standards by the Planning Department. Where an exceedance of the standards is identified, noise control measures shall be required.
  - d. Production phase. Noise measurements shall be obtained during a six-hour period between the hours from 10:00 pm to 7:00 am at least once each year during the production and completion phase.

Phase 2 of the proposed project has been designed to incorporate the following noise reduction features for the production equipment:

1. Each well pump will produce a sound power level no greater than 83 dBA. This may be achieved by fitting sound attenuating enclosures that provide an insertion loss of at least 15 dB.
2. The produced oil pumps, produced water pumps, water booster pumps and VFD cabinets will produce a sound power level no greater than 77 dBA.
3. The water injection pumps will produce a sound power level no greater than 83 dBA.
4. The vapor recovery compressors will produce a sound power level no greater than 83 dBA. The cooler for the compressors will produce a sound power level no greater than 85 dBA.

Figure 7-3 shows the noise contour map of the modeled Phase 2 drilling and test production scenario. Figure 7-4 shows the noise contour map of the modeled Phase 2 test production scenario. The predicted average noise levels at the nearby receptor locations are provided in Tables 7-6 and 7-7. Table 7-7 also provides the predicted increase in noise levels during the quietest nighttime hour due to the production equipment only. These noise levels include the incorporation of the noise reduction features defined above and included as part of the proposed project's operating plan.



**Figure 7-3. Phase 2 Drilling and Test Production Noise Levels**





**Figure 7-4. Phase 2 Test Production Noise Levels**





**Table 7-6. Predicted Noise Levels of Phase 2 Drilling and Test Production Activities**

Location	Average Noise Level (dBA)	Exceedance Above Nighttime Oil Code Standard of 45 dBA
	Drilling and Production	
Light manufacturing properties to north of project site	48.0	3.0
Light manufacturing properties to west of project site	46.9	1.9
Light manufacturing properties to south of project site	46.5	1.5
Residential properties to north of project site on 8 <sup>th</sup> St.	41.9	-
Residential properties east of Valley Dr.	43.5	-
Residential properties to south of project site on Ardmore Ave.	34.1	-
Residential properties to west of project site on Loma Dr.	42.9	-
Hermosa Valley Green Belt (center)	42.2	-
Hermosa Valley Green Belt (west boundary)	44.7	-

The results in Table 7-6 indicate that the noise levels during drilling plus production will exceed the Oil Code nighttime noise standard of 45 dBA by up to 3 dB at the light manufacturing properties immediately to the north, west and south of the project site. Light manufacturing land use is not identified as a noise sensitive land use in the Oil Code. As indicated in Table 7-6 the noise levels during drilling and production will not exceed the Oil Code noise standard of 45 dBA at residential properties. Based on the thresholds of significance defined in Section 6.4 of this report, the short-term increase in noise levels during Phase 2 test drilling plus production activities is considered a less than significant impact.

**Table 7-7. Predicted Noise Levels of Phase 2 Test Production Activities**

Location	Average Noise Level (dBA)		Increase in Noise Level during Quietest Hour due to Production (dB)
	Production Only	Existing Quietest Nighttime Hour Ambient Level Plus Production <sup>1</sup>	
Light manufacturing properties to north of project site	34.1	37.2	2.9
Light manufacturing properties to west of project site	34.1	39.3	1.5
Light manufacturing properties to south of project site	35.1	43.8	0.6
Residential properties to north of project site on 8 <sup>th</sup> St.	31.5	46.6	0.1
Residential properties east of Valley Dr.	31.5	42.5	0.4
Residential properties to south of project site on Ardmore Ave.	26.0	37.9	0.3
Residential properties to west of project site on Loma Dr.	34.1	41.8	0.8
Hermosa Valley Green Belt (center)	32.2	38.7	1.1
Hermosa Valley Green Belt (west boundary)	38.0	46.0	0.7

Notes:

1. Calculated by adding the predicted Phase 2 production noise levels to the existing lowest hourly  $L_{eq}$  ambient noise levels in Table 4-2.



As shown in Table 7-7 the noise levels during production only are below the existing ambient noise levels during the quietest nighttime hour at nearby receptors and the test production operations will result in an increase of less than 3 dB during the nighttime. Based on the threshold of significance defined in Section 6.4 of this report, the short-term increase in noise levels during Phase 2 production operations is considered a less than significant impact.

### **7.3 Phase 3 Final Design and Construction**

#### **7.3.1 Phase 3 Project Site Construction**

Refer to subsection 1.2 above for the construction activities that would occur during Phase 3. Phase 3 of the proposed project has an estimated duration of 14 months. Refer to Appendix B for Phase 3 schedule of activities. The worst-case noise levels during the Phase 3 construction activities were determined to occur during an overlapping period that includes construction of the five steel tanks and installation of the mechanical and electrical equipment. This specific overlapping period will occur for 8 weeks, from week 35 to week 42 in Phase 3. Table 7-8 provides the equipment in use during the modeled Phase 3 site construction activities. The sound power levels and acoustical usage factors are derived from those for typical public works construction projects and from information supplied by the applicant's consultants.

**Table 7-8. Sound Power Levels of Phase 3 Construction Equipment**

<b>Equipment</b>	<b>Quantity in model</b>	<b>Sound Power Level (dBA)</b>	<b>Acoustical Usage Factor (%)<sup>1</sup></b>
Crane	1	114.7	40
Welders	3	112.1	40
Forklifts	2	111.8	25
Manlifts	2	107.7	10
Backhoe	1	116.8	20
Concrete truck	1	111.7	10

Notes:

1. Acoustical usage factor is the percentage of time the equipment is expected to be in operation during the modeled scenario.

Phase 3 of the proposed project has been designed to incorporate the same noise reduction features designed for Phase 1. Refer to the list of noise reduction features provided in Section 7.1. In addition, the proposed project will comply with the construction noise control measures required by the 1993 Conditional Use Permit noted above for Phase 1. During Phase 3, a 16-foot high permanent perimeter block wall will be constructed around the project site. Prior to the construction of this wall, a 16-foot high temporary sound attenuation wall with a Sound Transmission Class (STC) rating of at least 25 will be in place around the site perimeter. There will not be any significant construction periods where a noise barrier is not in place.

The following additional noise reduction feature will be incorporated into the construction activities during Phase 3:



1. Temporary portable barriers at least 8 feet in height will be positioned around the concrete truck engine, welders, and crane engine when these pieces of equipment are in use. The barriers will be positioned as close to the equipment as possible.

Figure 7-5 shows a noise contour map of the modeled Phase 3 scenario. The average predicted noise levels at the loudest point of each of the nearby receptor locations are provided in Table 7-9. These noise levels include the incorporation of the noise reduction features defined above for Phase 1 and Phase 3 and included as a part of the proposed project’s operating plan.

**Table 7-9. Predicted Noise Levels of Phase 3 Construction Activities**

Location	Average Noise Level (dBA)		Increase in Daytime Noise Level due to Phase 3 Construction (dB)
	Phase 3 Project Site Construction	Existing Daytime Ambient Level Plus Phase 3 Construction	
Light manufacturing properties to north of project site	56.4	59.2	3.3
Light manufacturing properties to west of project site	58.1	60.8	3.3
Light manufacturing properties to south of project site	61.9	63.9	4.3
Residential properties to north of project site on 8 <sup>th</sup> St.	55.3	63.9	0.6
Residential properties east of Valley Dr.	56.0	62.3	1.1
Residential properties to south of project site on Ardmore Ave.	51.7	55.7	2.2
Residential properties to west of project site on Loma Dr.	60.1	62.2	4.1
Hermosa Valley Green Belt (center)	56.5	58.3	4.8
Hermosa Valley Green Belt (west boundary)	60.9	64.2	2.7
Notes:			
1. Calculated by adding the predicted Phase 3 construction noise levels to the existing daytime $L_{eq}$ ambient noise levels in Table 4-2.			

The results in Table 7-9 indicate that the noise levels produced during Phase 3 construction at the project site will result in an increase of less than 5 dB to the overall ambient noise level during the daytime hours. No construction activities would occur during the nighttime. Based on the thresholds of significance defined in Section 6.4 of this report, this short-term increase in noise levels during the Phase 3 construction activities (including during the worst-case overlapping period) is considered a less than significant impact.



**Figure 7-5. Phase 3 Project Site Construction Noise Levels**





**7.3.2 Phase 3 Pipeline Construction**

Noise impacts associated with the construction of the pipeline were assessed at seven locations along the pipeline route. These locations are:

1. Valley Drive between 6<sup>th</sup> Street and 2<sup>nd</sup> Street.
2. Westbound lanes of Anita Street between N. Paulina Avenue and Prospect Avenue
3. Eastbound lanes of Anita Street between N. Paulina Avenue and Prospect Avenue
4. Southern California Edison utility corridor between N. Paulina Avenue and Prospect Avenue
5. Westbound lanes of 190<sup>th</sup> Street between Inglewood Avenue and Firmona Avenue
6. Eastbound lanes of 190<sup>th</sup> Street between Inglewood Avenue and Firmona Avenue
7. Southern California Edison utility corridor between Inglewood Avenue and Firmona Avenue

These locations were chosen so that the analysis addresses all three pipeline alignment scenarios and all three Cities where the construction noise will occur. The equipment used for the construction activities, along with the assumed sound power levels and acoustical usage factors, are provided in Table 7-10.

**Table 7-10. Sound Power Levels of Phase 3 Pipeline Construction Equipment**

<b>Equipment</b>	<b>Quantity in model</b>	<b>Sound Power Level (dBA)</b>	<b>Acoustical Usage Factor (%)</b>
Pipe fitter trucks	2 <sup>1</sup>	111.7	16
Sideboom truck	2 <sup>1</sup>	116.7	16
Trencher	2 <sup>1</sup>	113.3	50
Backhoe	2 <sup>1</sup>	116.8	40
Water truck	1	111.7	16
Dump trucks	4 <sup>1</sup>	115.0	40
Flatbed trucks	2 <sup>1</sup>	111.7	16
Paver	1	116.8	50
Concrete truck	1	116.8	40
Notes:			
1. Equipment quantity varies at Location 1 due to the narrow street width of Valley Drive. The equipment quantity is reduced to half at this location.			

Phase 3 of the proposed project has been designed to incorporate the following noise reduction features during the pipeline construction activities:

1. Temporary portable acoustical barriers at least 12 feet in height will be positioned on either side of the pavers and trenchers. The barriers will have an STC rating of at least 25 and will be long enough to block the line-of-sight to the nearest sensitive receptors. The barriers will be moved alongside the equipment as the machinery progresses along the pipeline route.



2. Pipeline construction will be limited to daylight hours between 8:00 am and 3:00 pm Monday through Friday in the City of Hermosa Beach and 9:00 am and 3:00 pm Monday through Friday in the Cities of Redondo Beach and Torrance. No construction will take place on holidays.

Figures 7-6 through 7-12 provide the noise contour maps showing the modeled predicted average noise levels due to noise associated with the construction of three pipeline alignment scenarios. These noise levels include the incorporation of the noise reduction features and the 1993 CUP conditions of approval defined above and included as a part of the proposed project. The predicted noise levels at the nearest sensitive receptor are provided in Table 7-11. Refer to Table 4-3 and Figures 4-2 through 4-4 for the existing noise levels at these locations.

**Table 7-11. Predicted Noise Levels due to Pipeline Construction at Nearest Sensitive Receptors**

Location	Nearest Sensitive Receptor	Average Noise Level, dBA
1	Apartments west of Valley Drive	88.6
2	Residences north of Anita Street	89.9
3	Residences north of Anita Street	82.6
4	Residences south of SCE utility corridor	80.4
5	Residences north of 190 <sup>th</sup> Street	87.3
6	Residences south of 190 <sup>th</sup> Street	89.1
7	Residences south of SCE utility corridor	86.8

As shown in Table 7-11 in comparison to the existing ambient noise levels shown in Table 4-3, the average noise levels produced by the pipeline construction are 9 dB to 25 dB higher than the existing daytime average ambient noise levels at the selected nearby receptor locations along the three pipeline alignment scenarios. The construction of the pipeline will occur within the permissible hours of construction defined for the Cities of Hermosa Beach, Redondo Beach and Torrance. In addition to the construction activities being limited to daytime hours, each segment of the pipeline construction will be completed within a two day time period. Based on the thresholds of significance defined in Section 6.4 of this report, this short-term increase in noise levels during the pipeline construction in Phase 3 is considered a less than significant impact.



Figure 7-6. Pipeline Construction Noise Levels at Location 1

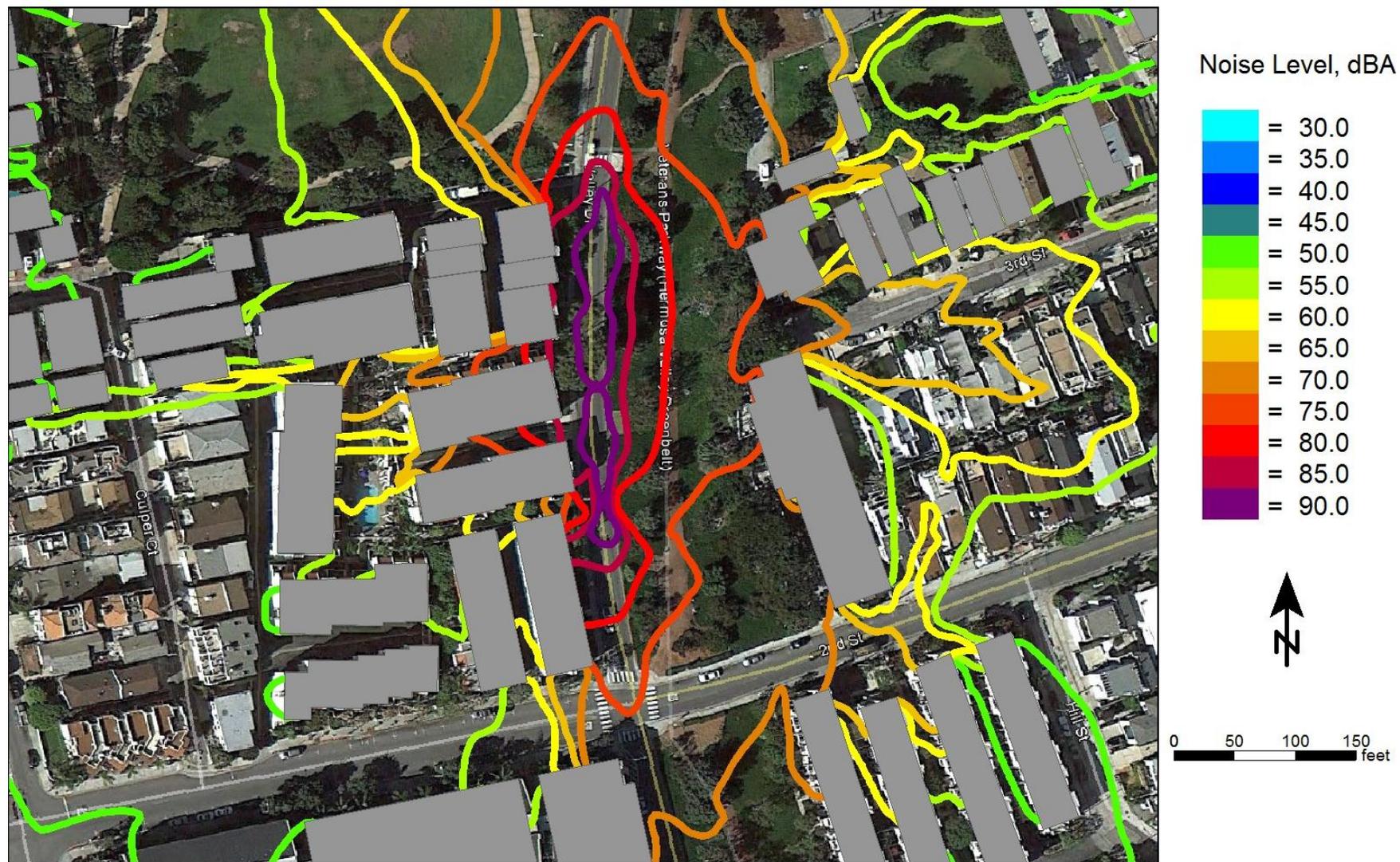




Figure 7-7. Pipeline Construction Noise Levels at Location 2





**Figure 7-8. Pipeline Construction Noise Levels at Location 3**



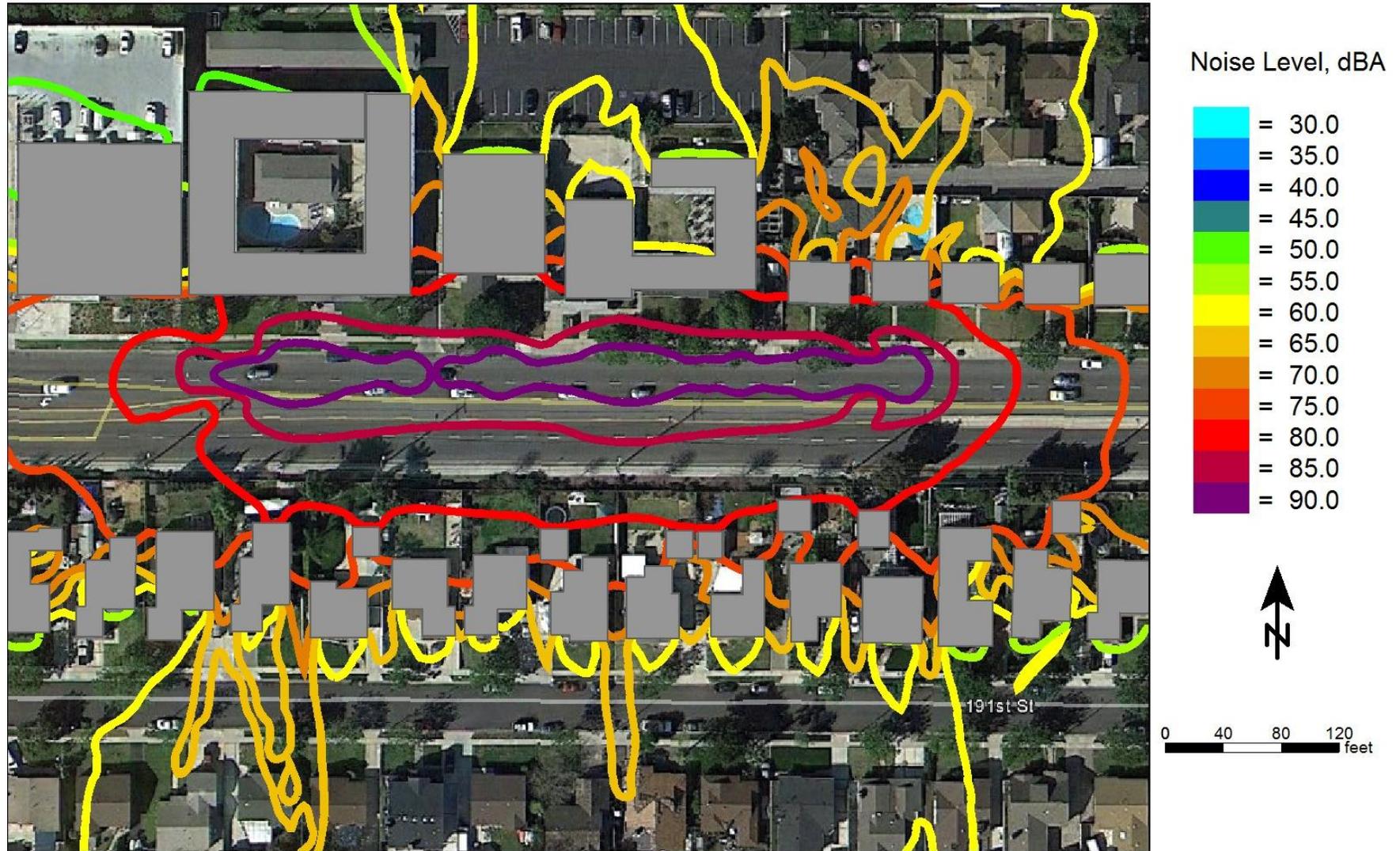


Figure 7-9. Pipeline Construction Noise Levels at Location 4





**Figure 7-10. Pipeline Construction Noise Levels at Location 5**





**Figure 7-11. Pipeline Construction Noise Levels at Location 6**





**Figure 7-12. Pipeline Construction Noise Levels at Location 7**





## 7.4 Phase 4 Development and Operations

Refer to Subsection 1.2 above for the activities that would occur during Phase 4. Refer to Appendix B for Phase 4 schedule of activities. Phase 4 of the proposed project includes both drilling activities and long-term production and maintenance activities. The drilling equipment will be the same as for Phase 2 and will occur 24 hours per day at the project site for a period of approximately 30 months. The noise reduction features defined above for Phase 2 drilling will be implemented in Phase 4.

At the start of Phase 4, both the production equipment and drilling equipment will be operating simultaneously. The production equipment will continue to operate for the life of the proposed project after drilling operations have finished at the project site. Therefore, two noise analyses for Phase 4 were performed. The first is for drilling and production activities together (including all equipment listed in Tables 7-4 and 7-12) and the second is for long-term production only (including only the equipment listed in Table 7-12). Refer to Phase 2 above for the drilling equipment information and sound power levels. The production equipment sound power levels assumed in this analysis are derived from sound level measurements obtained at similar facilities and from manufacturers' data. The sound power levels and quantities of production equipment used in the noise model are provided in Table 7-12.

**Table 7-12. Sound Power Levels of Long-Term Production Equipment**

<b>Equipment</b>	<b>Quantity in model</b>	<b>Sound Power Level, dBA</b>
Well pumps	30	97.7
Produced oil pump	1	77.7
Produced water pump	1	86.7
Shipping pump	1	92.8
Water booster pump	1	86.7
Water injection pumps	2	102.8
Vapor recovery compressor	2	88.6
Vapor recovery unit cooler	1	90.2
1 <sup>st</sup> stage compressor	2	96.2
2 <sup>nd</sup> stage compressor	2	96.2
Compressor cooler	2	102.0
Amine cooler	1	102.1
DEA charge pump	1	77.7
Regenerator reflux pump	1	77.7
Chiller	1	85.0
Glycol regenerator	1	92.4
Micro-turbines, including exhaust	5	92.9
Variable frequency drive cabinets	30	83.3

Phase 4 of the proposed project has been designed to incorporate the following noise reduction features for the production equipment:

1. Each well pump will produce a sound power level no greater than 73 dBA. This may be achieved by fitting sound attenuating enclosures that provide an insertion loss of at least 25 dB.



2. The amine cooler will be located no higher than 10 feet above the containment area ground level. The cooler will not produce a sound power level greater than 82 dBA.
3. Each variable frequency drive cabinet will produce a sound power level no greater than 63 dBA.
4. The compressor motors will produce a sound power level no greater than 81 dBA. This may be achieved by fitting the compressor motors with an acoustically rated enclosure providing at least 15 dB of sound reduction. The sound power level of the compressor fans will not exceed 75 dBA. This level may be achieved by fitting the fans with silencers having an insertion loss of at least that provided in the table below:

Octave Band Center Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Insertion Loss (dB)	8	14	29	41	40	41	32	17

5. The produced oil pumps, produced water pumps, water booster pumps, DEA charge pumps and regenerator reflux pumps will produce a sound power level no greater than 67 dBA.
6. The shipping pumps will produce a sound power level no greater than 73 dBA.
7. The water injection pumps will produce a sound power level no greater than 83 dBA.
8. The vapor recovery compressors will produce a sound power level no greater than 67 dBA. The cooler for the compressors will not produce a sound power level greater than 85 dBA.
9. The chiller will produce a sound power level no greater than 65 dBA.
10. The glycol regenerator will produce a sound power level no greater than 73 dBA.
11. The micro-turbines will produce a sound power level no greater than 67 dBA. This may be achieved with an acoustically rated enclosure providing at least 20 dB of sound reduction. The micro-turbine exhausts will be silenced and will not produce a sound power level greater than 73 dBA.

Phase 4 of the proposed project has been design to be in compliance with the following drilling and production equipment noise control measures provided in the 1993 Conditional Use Permit:

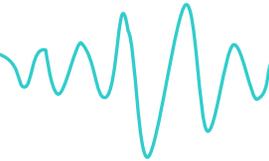
1. Pumping units will be maintained to minimize noise from worn parts.
2. All oil maintenance equipment, vehicles and non-electrical motors will be equipped with manufacturer approved mufflers or housed in a sound-proofing device.
3. Noise monitoring will be performed at least once each year for a six-hour period between the hours of 10 pm and 7 am during the production and completion phase.

Figure 7-13 shows the noise contour map of the modeled Phase 4 drilling and production scenario. Figure 7-14 shows the noise contour map of the modeled Phase 4 long-term production scenario. Tables 7-13 and 7-14 provide the predicted average noise levels at the nearby receptor locations for



**Figure 7-13. Phase 4 Drilling and Production Noise Levels**





**Figure 7-14. Phase 4 Long Term Production Only Noise Levels**





these scenarios. These noise levels include the incorporation of the noise reduction features defined above and included as a part of the proposed project's operating plan.

**Table 7-13. Predicted Noise Levels of Phase 4 Drilling and Production Activities**

Location	Average Noise Level (dBA)	Exceedance Above Nighttime Oil Code Standard of 45 dBA
	Drilling and Production	
Light manufacturing properties to north of project site	47.9	2.9
Light manufacturing properties to west of project site	46.8	1.8
Light manufacturing properties to south of project site	49.9	4.9
Residential properties to north of project site on 8 <sup>th</sup> St.	41.7	-
Residential properties east of Valley Dr.	43.9	-
Residential properties to south of project site on Ardmore Ave.	34.2	-
Residential properties to west of project site on Loma Dr.	42.3	-
Hermosa Valley Green Belt (center)	42.0	-
Hermosa Valley Green Belt (west boundary)	49.5	4.5

The results in Table 7-13 indicate that the noise levels during drilling plus production will exceed the Oil Code nighttime noise standard of 45 dBA by up to 4.9 dB at the adjacent light manufacturing properties immediately to the north, west and south of the project site and by up to 4.5 dB at the Hermosa Valley Green Belt. Light manufacturing and open space are not identified as a noise sensitive land uses in the Oil Code. As indicated in Table 7-13, the noise levels during drilling plus production will not exceed the Oil Code standard of 45 dBA at any residential property. Based on the thresholds of significance defined in Section 6.4 of this report, the temporary increase in noise levels during Phase 4 drilling plus production is considered a less than significant impact.



**Table 7-14. Predicted Noise Levels of Phase 4 Long-Term Production Activities**

Location	Average Noise Level (dBA)		Increase in Noise Level during Quietest Hour due to Production (dB)
	Production Only	Existing Quietest Nighttime Hour Ambient Level Plus Production <sup>1</sup>	
Light manufacturing properties to north of project site	33.3	36.8	2.5
Light manufacturing properties to west of project site	35.8	39.9	2.1
Light manufacturing properties to south of project site	40.4	45.0	1.8
Residential properties to north of project site on 8 <sup>th</sup> St.	30.7	46.6	0.1
Residential properties east of Valley Dr.	33.7	42.7	0.6
Residential properties to south of project site on Ardmore Ave.	29.2	38.2	0.6
Residential properties to west of project site on Loma Dr.	36.8	42.4	1.4
Hermosa Valley Green Belt (center)	32.6	38.8	1.2
Hermosa Valley Green Belt (west boundary)	36.4	45.8	0.5
Notes:			
1. Calculated by adding the construction noise levels to the existing daytime L <sub>eq</sub> ambient noise levels in Table 4-2.			

As shown in Table 7-14, the noise levels during production only are below the existing ambient noise levels during the quietest nighttime hour at nearby receptors and the permanent production operations will result in an increase of less than 3 dB during the nighttime. Based on the threshold of significance criteria defined in Section 6.4 of this report, the long-term increase in noise levels due to the ongoing operation of Phase 4 of the proposed project is considered a less than significant impact.

Workover rigs produce significantly lower noise levels than drilling rigs due to the smaller size of mechanical equipment and different nature of the operation. Previous measurements indicate that a typical workover rig has a sound level of 98 dBA. This is 15 dB lower than the sum of the assumed sound power levels of the ensign drill rig equipment modeled for this study. For the proposed project, the noise sources associated with the workover rig will have acoustical treatment. Workover rig operations are limited to the daytime hours when significantly higher ambient noise levels are experienced compared to the nighttime hours.

The workover rig noise level stated above indicates that the noise level produced during the use of the workover rig will not exceed the daytime Oil Code standard of 50 dBA at any property. Based on the threshold of significance defined in Section 6.4 of this report, the periodic increase in noise levels during use of the workover rig in Phase 4 is considered a less than significant impact.

Phase 4 of the proposed project has been designed to incorporate the following noise control during on-going maintenance activities at the project site:



1. Workover rigs will be operated only between the hours of 8 am and 6 pm during weekdays. The exhaust and intake of the diesel engine will be muffled. The engine will be enclosed with acoustical blankets with an STC rating of at least 25.
2. Workover operations will be limited to 90 days per year.

## 7.5 Traffic Noise Analysis

An analysis of the traffic noise was performed for the proposed truck routes anticipated to be used for the proposed project. The routes assessed in this study are shown in Figure 7-15.

The scenarios assessed in this analysis are:

- Existing traffic conditions
- Future traffic conditions in 2016 without the project
- Future traffic conditions in 2016 with Phase 3 project traffic
- Future traffic conditions in 2035 without the project
- Future traffic conditions in 2035 with long-term operation project traffic

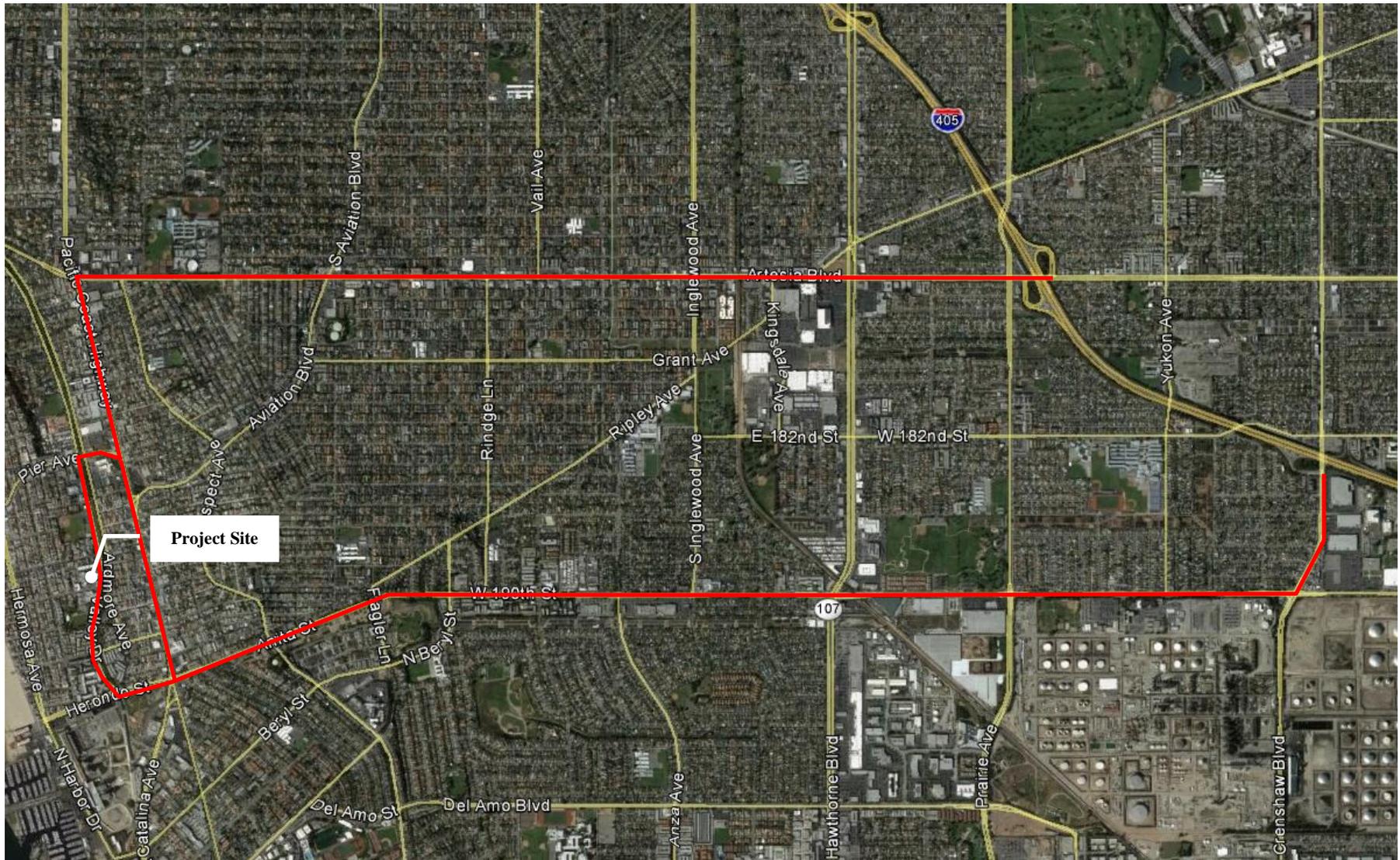
Local road traffic count data and project daily trip generation data, supplied by Arch Beach Consulting (generated in the preparation of the Traffic Impact Analysis) was used as the basis for the model. Phase 3 represents the worst-case conditions for the proposed project because it includes the highest number of project-generated daily vehicle trips (18 truck trips and 55 car trips to and from the project site per day). To assess noise impacts, CNEL noise levels were predicted at the nearest sensitive receptors to the roadway. The predicted existing noise levels were compared with the ambient road traffic noise measurements obtained for the proposed project to verify that the modeled levels correspond with reasonable accuracy to the measured noise levels. Exact agreement between the predicted and measured noise levels is not expected due to factors such as differences in the placement of the microphone compared to the noise prediction location and variances in the traffic speed due to congestion and the location of intersections.

For the proposed project, truck mix data was collected for peak traffic hours, but not the full 24-hour traffic data collection periods. The truck mix used in the analysis is therefore based on guidelines used for traffic analyses in the County of Riverside (this was the only available source). Checks were made to ensure this assumed truck mix is representative of existing conditions for the proposed project by comparing the assumed truck mix to peak hour truck mix data obtained for the proposed project. The two sets of data correlated closely. Appendix D contains the full results of the noise modeling analysis.

The results of the analysis are provided in Table 7-15. Based on the thresholds of significance defined in Section 6.4 of this report, the increase in vehicle traffic during the worst-case project-generated traffic in Phase 3 and during the long-term operation of the proposed project in Phase 4, the traffic generated noise levels will be less than significant for all phases of the proposed project.



**Figure 7-15. Proposed Project Truck Routes**





**Table 7-15. Predicted CNEL Noise Levels at the Nearest Sensitive Receptor**

Street Segment	CNEL (dBA)						
	Existing	2016 (Phase 3)		Change Due to Project	2035 (Phase 4 Long-term Operations)		Change Due to Project
		Without Project	With Project		Without Project	With Project	
<b>6<sup>th</sup> Street</b>							
Valley Dr. to Hermosa Ave.	56.0	56.4	57.4	1.0	56.5	56.5	0.0
<b>Artesia Boulevard</b>							
East of Prospect St.	76.3	76.4	76.4	0.0	76.5	76.5	0.0
Prospect St. to PCH	77.2	77.3	77.3	0.0	77.5	77.5	0.0
<b>Crenshaw Boulevard</b>							
190th St. to I-405	79.6	79.6	79.6	0.0	79.8	79.8	0.0
<b>Herondo Street/Anita Street/190<sup>th</sup> Street</b>							
Valley Dr. to PCH	72.7	72.8	72.8	0.0	72.9	72.9	0.0
PCH to Prospect Ave.	74.5	74.6	74.6	0.0	74.7	74.7	0.0
Prospect Ave. to Flagler Ln.	74.7	74.7	74.7	0.0	74.9	74.9	0.0
Flagler Ln. to Blossom Ln.	74.7	74.7	74.7	0.0	74.9	74.9	0.0
Blossom Ln. to Meyer Ln.	76.0	76.0	76.0	0.0	76.2	76.2	0.0
Meyer Ln. to Anza Ave.	77.4	77.4	77.4	0.0	77.6	77.6	0.0
Anza Ave. to Inglewood Ave.	77.4	77.4	77.4	0.0	77.6	77.6	0.0
Inglewood Ave. to Firmona Ave.	76.9	77.0	77.0	0.0	77.1	77.1	0.0
Firmona Ave to Hawthorne Blvd	77.0	77.0	77.0	0.0	77.2	77.2	0.0
Hawthorne Blvd. to Prairie Ave.	76.1	76.1	76.1	0.0	76.3	76.3	0.0
Prairie Ave. to Crenshaw Blvd.	77.1	77.2	77.2	0.0	77.3	77.3	0.0
<b>Pacific Coast Highway</b>							
Artesia Blvd to Pier Ave	79.0	79.1	79.1	0.0	79.2	79.2	0.0
Pier Ave to Aviation Blvd	79.5	79.5	79.5	0.0	79.7	79.7	0.0
Aviation Blvd to Herondo St	82.9	83.0	83.0	0.0	83.1	83.1	0.0
<b>Pier Avenue</b>							
PCH to Valley Dr.	68.4	68.4	68.5	0.1	68.6	68.6	0.0
<b>Valley Drive</b>							
Pier Ave to 6th St.	64.6	64.7	64.9	0.2	64.8	64.9	0.1
6th St. to Herondo St.	64.4	64.4	64.8	0.4	64.6	64.6	0.0

The traffic noise study was performed using Caltrans Sound32 software, which is based on the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.

## 7.6 Vibration Analysis

Phases 1 and 3 of the proposed project involve the use of equipment during demolition and construction activities that have the potential to cause vibration at properties near the project site and along the pipeline alignment scenarios. The drilling and production equipment that will be used at the project site in Phases 2 and 4 will not produce substantial vibration levels and were not considered in this study.



The vibration levels produced by construction equipment analyzed in Phases 1 and 3 are provided in Table 7-16. This data is derived from measured equipment vibration levels at construction sites and from data provided by the Federal Transportation Authority (1995). Table 7-16 also provides minimum allowable distances from the equipment to the receptor property lines.

**Table 7-16. Equipment Vibration Levels and Allowable Property Line Distances**

Equipment	Phase Usage	PPV Vibration Level at 25 ft (ips)	Minimum Allowable Distance to Receptor Property Line (ft)
Large Hydraulic Excavator	3	0.079	5
Backhoe	1, 3	0.089	6
Auger	1, 3	0.089	6
Large Bulldozer	3	0.089	6
Vibratory Roller	1, 3	0.210	12
Tamper	1, 3	0.035	3
Crane	1, 3	0.031	2
Trencher	3	0.055	4
Large Truck	1,3	0.076	5
Hydraulic Concrete Buster	1	0.240	13

The following additional noise reduction feature will be incorporated into the construction activities during Phases 1 and 3:

1. Where work requires construction equipment to operate closer to the property line than permitted in Table 7-16, alternative demolition or construction equipment or methods will be used. Such methods may include the use of a crusher instead of a hydraulic concrete buster and reduction of the amplitude vibration of the vibratory roller.

The PPV vibration levels were calculated at the nearest property line to the equipment that will be used in Phases 1 and 3. The results of the vibration analysis are provided in Table 7-17. Table 7-17 shows the PPV vibration levels produced by the various pieces of equipment at the nearest receptor locations.

**Table 7-17. Predicted PPV Vibration Levels**

Equipment	Predicted PPV Vibration Level at Nearest Receptor Location Property Line (ips)
Large Hydraulic Excavator	0.5
Backhoe	0.5
Auger	0.5
Large Bulldozer	0.5
Vibratory Roller	0.5
Tamper	0.5
Crane	0.5
Trencher	0.5
Large Truck	0.5
Hydraulic Concrete Buster	0.5



Comparison of the predicted PPV vibration levels with the vibration thresholds of significance defined in Section 6.4 of this report indicates that, with the equipment distance limits in Table 7-17 imposed on construction equipment during the construction activities in Phase 1 and 3 of the proposed project at the project site and along the pipeline alignment scenarios, the short term vibration levels will be considered less than significant.

## **8. CUMULATIVE IMPACTS**

There are no known future projects within the vicinity of the project site. Therefore, no cumulative impact analysis related to the increase in noise or vibration levels at the project site or in the vicinity was performed. For the traffic noise analysis, projected future average daily traffic volumes were added to the project-generated traffic. The traffic noise analysis is therefore already cumulative.

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## **Appendix A**

### **Ambient Noise Measurement Data**

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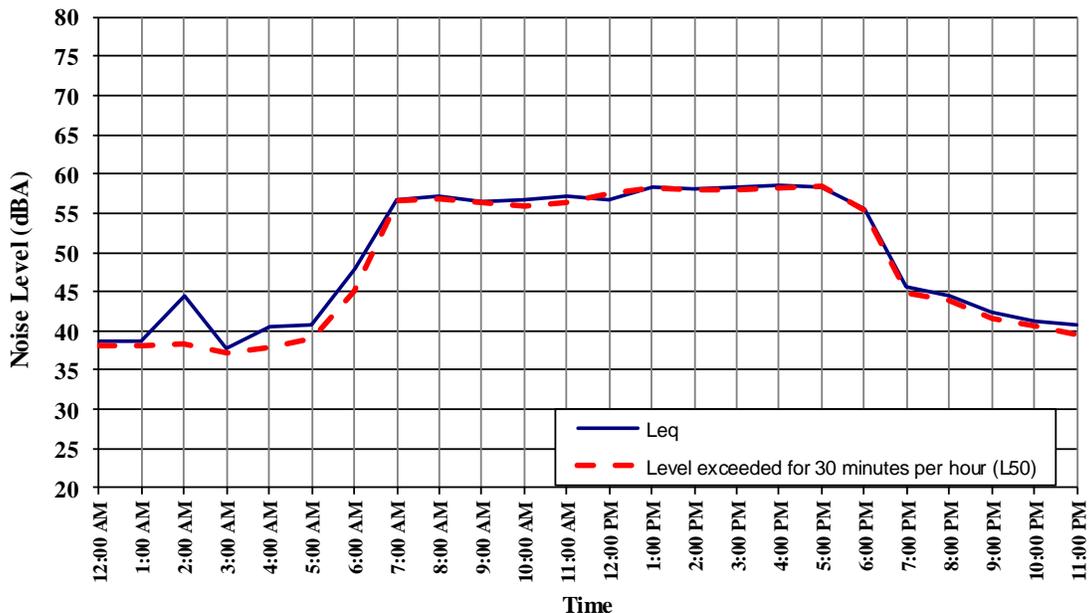


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S1  
**Location Description:** West property line of yard  
**Start Date:** 8/28/2012      **Run Time:** 2 Days  
**Start Time:** 1:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	38.6	38.0	12:00 PM	56.7	57.6
1:00 AM	38.6	38.2	1:00 PM	58.2	58.2
2:00 AM	44.5	38.4	2:00 PM	58.1	58.0
3:00 AM	37.8	37.2	3:00 PM	58.4	58.1
4:00 AM	40.5	37.9	4:00 PM	58.5	58.3
5:00 AM	40.8	39.0	5:00 PM	58.3	58.5
6:00 AM	47.9	45.0	6:00 PM	55.5	55.5
7:00 AM	56.6	56.5	7:00 PM	45.7	44.7
8:00 AM	57.1	56.7	8:00 PM	44.6	44.0
9:00 AM	56.5	56.3	9:00 PM	42.4	41.6
10:00 AM	56.6	55.9	10:00 PM	41.2	40.6
11:00 AM	57.2	56.4	11:00 PM	40.8	39.5

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 57.5  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 47.3



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## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S2

**Location Description:** North property line of yard (top of wall)

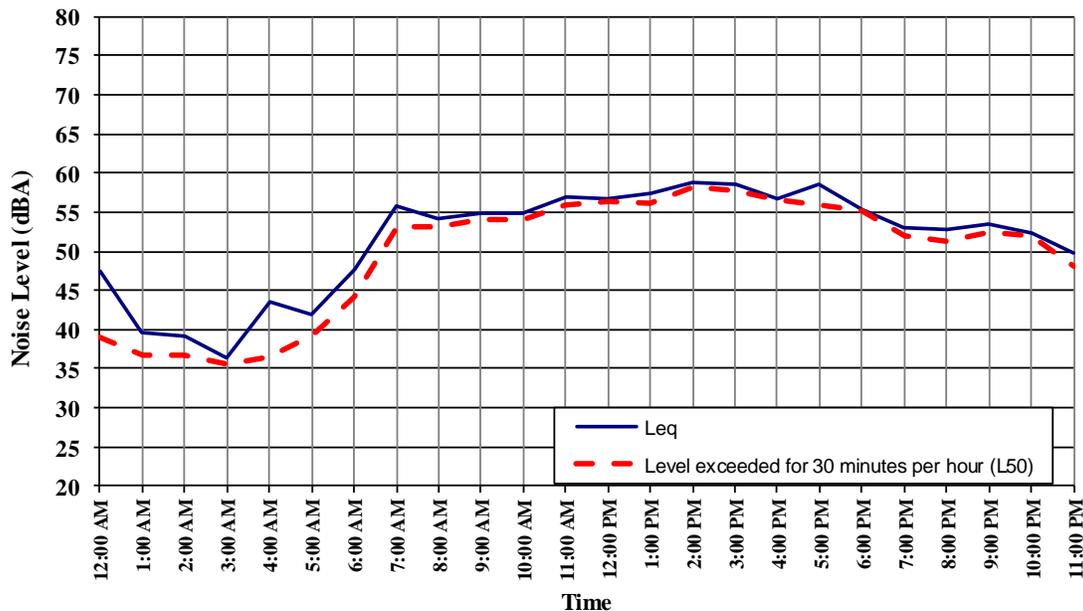
**Start Date:** 8/21/2012      **Run Time:** 2 Days

**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	47.6	38.9	12:00 PM	56.8	56.3
1:00 AM	39.7	36.6	1:00 PM	57.4	56.2
2:00 AM	39.2	36.7	2:00 PM	58.8	58.3
3:00 AM	36.5	35.6	3:00 PM	58.4	57.8
4:00 AM	43.5	36.5	4:00 PM	56.8	56.7
5:00 AM	41.9	39.2	5:00 PM	58.5	55.8
6:00 AM	47.6	44.2	6:00 PM	55.3	55.2
7:00 AM	55.7	53.2	7:00 PM	53.1	52.0
8:00 AM	54.2	53.1	8:00 PM	52.7	51.2
9:00 AM	54.8	54.0	9:00 PM	53.4	52.5
10:00 AM	54.8	54.0	10:00 PM	52.3	51.9
11:00 AM	57.0	55.9	11:00 PM	49.8	48.0

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 56.9

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 50.4



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## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S3

**Location Description:** East side yard gate

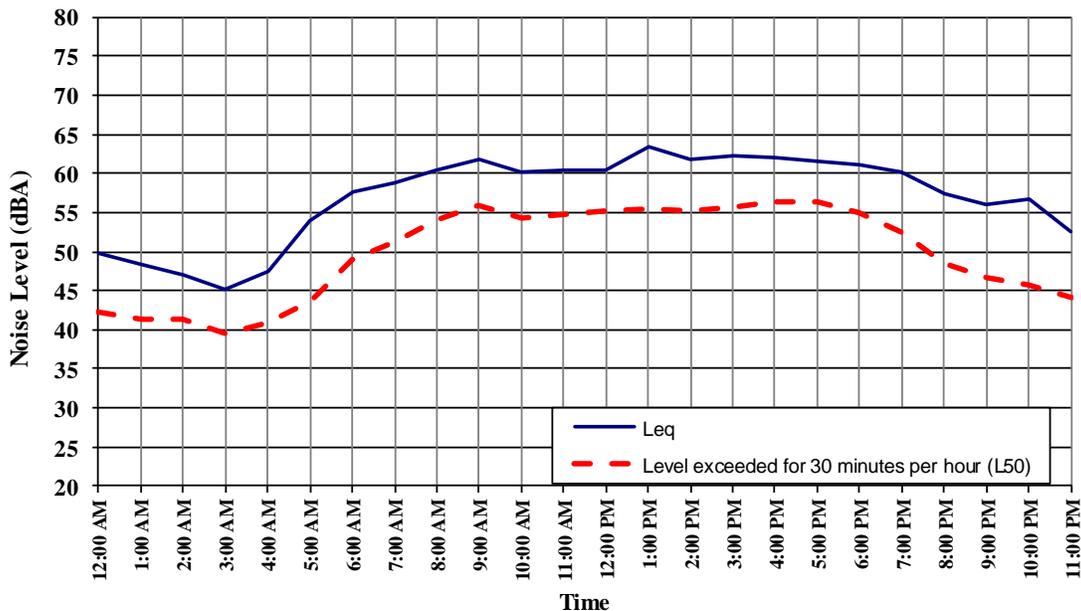
**Start Date:** 8/14/2012      **Run Time:** 2 Days

**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	49.7	42.2	12:00 PM	60.4	55.1
1:00 AM	48.3	41.4	1:00 PM	63.4	55.4
2:00 AM	47.0	41.4	2:00 PM	61.9	55.2
3:00 AM	45.3	39.4	3:00 PM	62.3	55.6
4:00 AM	47.5	40.9	4:00 PM	62.0	56.3
5:00 AM	54.0	43.7	5:00 PM	61.5	56.5
6:00 AM	57.7	48.9	6:00 PM	61.1	55.0
7:00 AM	58.7	51.3	7:00 PM	60.3	52.4
8:00 AM	60.5	54.0	8:00 PM	57.3	48.6
9:00 AM	61.8	56.0	9:00 PM	55.9	46.6
10:00 AM	60.2	54.3	10:00 PM	56.6	45.8
11:00 AM	60.3	54.7	11:00 PM	52.5	44.2

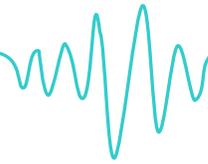
**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 61.5

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 55.4



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## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S4

**Location Description:** South side yard fence

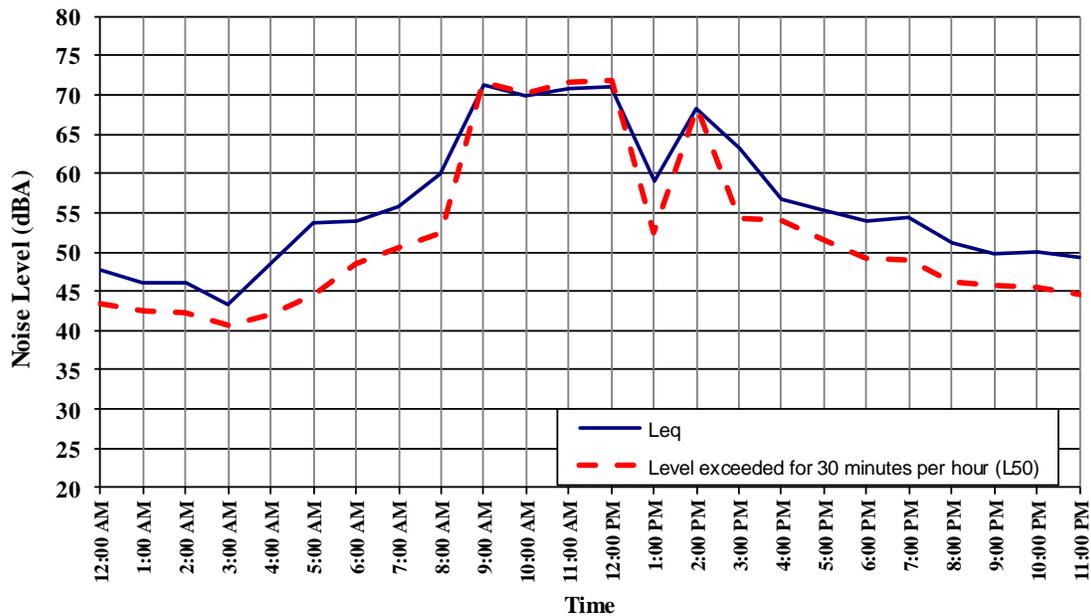
**Start Date:** 8/14/2012      **Run Time:** 2 Days

**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	47.7	43.4	12:00 PM	71.1	71.9
1:00 AM	46.1	42.4	1:00 PM	58.9	52.4
2:00 AM	46.0	42.2	2:00 PM	68.1	68.3
3:00 AM	43.2	40.7	3:00 PM	63.1	54.3
4:00 AM	48.6	42.0	4:00 PM	56.7	54.0
5:00 AM	53.7	44.6	5:00 PM	55.2	51.5
6:00 AM	53.9	48.4	6:00 PM	54.0	49.2
7:00 AM	55.9	50.6	7:00 PM	54.3	48.9
8:00 AM	60.0	52.4	8:00 PM	51.1	46.2
9:00 AM	71.3	71.6	9:00 PM	49.8	45.8
10:00 AM	69.9	70.2	10:00 PM	49.9	45.4
11:00 AM	70.8	71.7	11:00 PM	49.3	44.5

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 67.3

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 51.4



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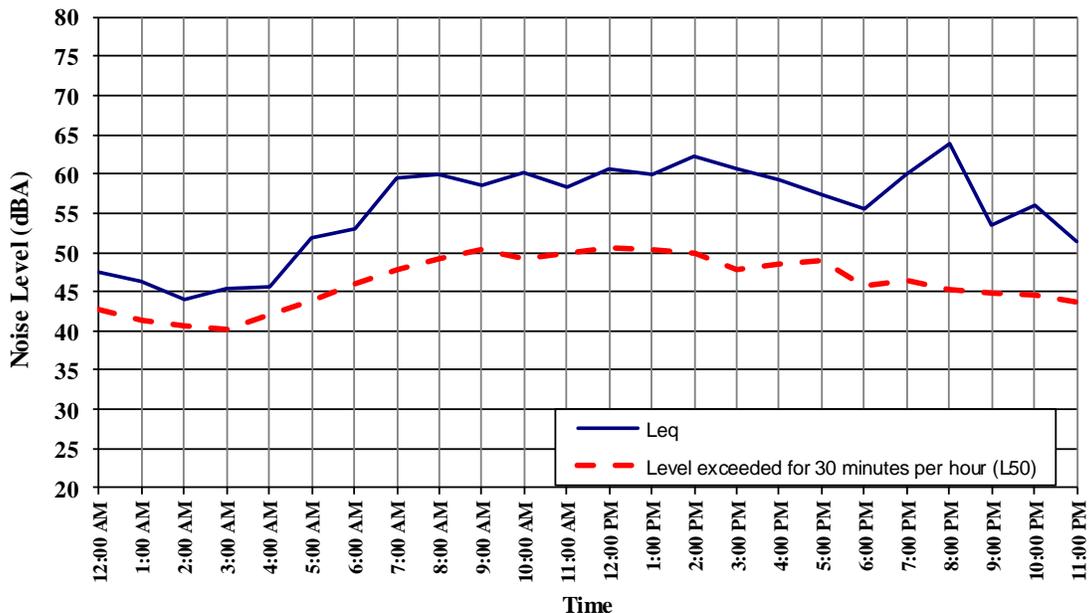


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S5  
**Location Description:** Sixth St. and Cypress Ave.  
**Start Date:** 8/8/2012      **Run Time:** 2 Days  
**Start Time:** 11:00 AM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	47.5	42.8	12:00 PM	60.7	50.5
1:00 AM	46.3	41.4	1:00 PM	59.9	50.3
2:00 AM	43.9	40.7	2:00 PM	62.2	50.0
3:00 AM	45.3	40.3	3:00 PM	60.6	47.8
4:00 AM	45.5	42.0	4:00 PM	59.2	48.5
5:00 AM	51.9	43.9	5:00 PM	57.5	48.9
6:00 AM	52.9	46.0	6:00 PM	55.5	45.7
7:00 AM	59.5	47.9	7:00 PM	59.9	46.4
8:00 AM	59.9	49.3	8:00 PM	63.8	45.2
9:00 AM	58.6	50.3	9:00 PM	53.4	44.7
10:00 AM	60.1	49.2	10:00 PM	56.0	44.5
11:00 AM	58.4	49.9	11:00 PM	51.3	43.6

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 59.6  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 56.3



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

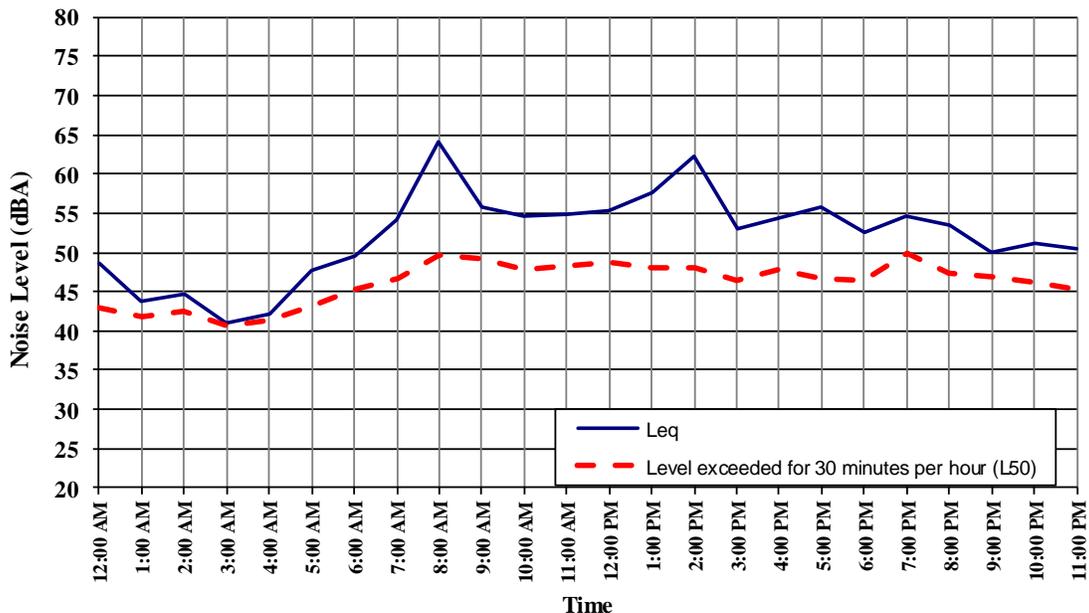


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S6  
**Location Description:** Front of 634 Loma Dr.  
**Start Date:** 8/14/2012      **Run Time:** 2 Days  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	48.7	43.0	12:00 PM	55.3	48.7
1:00 AM	43.7	41.8	1:00 PM	57.6	48.1
2:00 AM	44.7	42.4	2:00 PM	62.3	48.0
3:00 AM	41.0	40.6	3:00 PM	53.0	46.4
4:00 AM	42.1	41.3	4:00 PM	54.3	47.7
5:00 AM	47.7	43.3	5:00 PM	55.7	46.7
6:00 AM	49.4	45.2	6:00 PM	52.6	46.3
7:00 AM	54.2	46.6	7:00 PM	54.6	49.8
8:00 AM	64.0	49.6	8:00 PM	53.5	47.4
9:00 AM	55.7	49.2	9:00 PM	50.1	46.9
10:00 AM	54.7	47.9	10:00 PM	51.1	46.3
11:00 AM	54.8	48.2	11:00 PM	50.4	45.3

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 58.1  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 50.4



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## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S7

**Location Description:** 730 Cypress Ave.

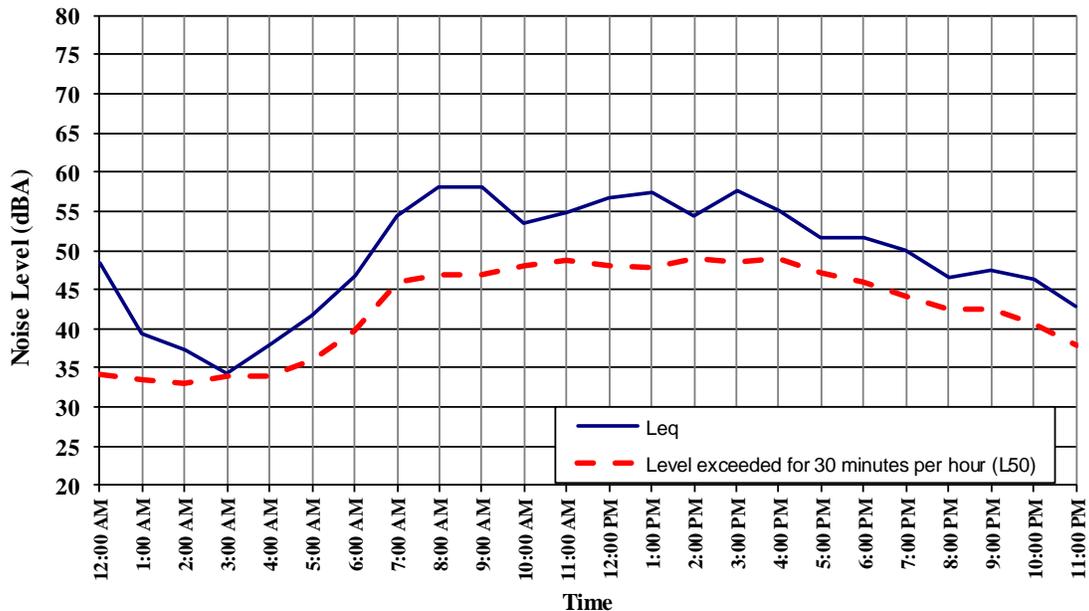
**Start Date:** 8/21/2012      **Run Time:** 2 Days

**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	48.3	34.1	12:00 PM	56.6	48.0
1:00 AM	39.5	33.5	1:00 PM	57.3	47.7
2:00 AM	37.3	33.1	2:00 PM	54.5	49.0
3:00 AM	34.3	33.9	3:00 PM	57.7	48.5
4:00 AM	37.9	33.9	4:00 PM	55.1	48.9
5:00 AM	41.6	36.0	5:00 PM	51.6	47.1
6:00 AM	46.9	39.8	6:00 PM	51.7	45.9
7:00 AM	54.3	46.1	7:00 PM	50.0	44.1
8:00 AM	58.0	46.8	8:00 PM	46.4	42.4
9:00 AM	58.0	46.9	9:00 PM	47.6	42.5
10:00 AM	53.4	48.1	10:00 PM	46.4	40.8
11:00 AM	54.8	48.7	11:00 PM	42.9	37.8

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 55.9

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 47.2



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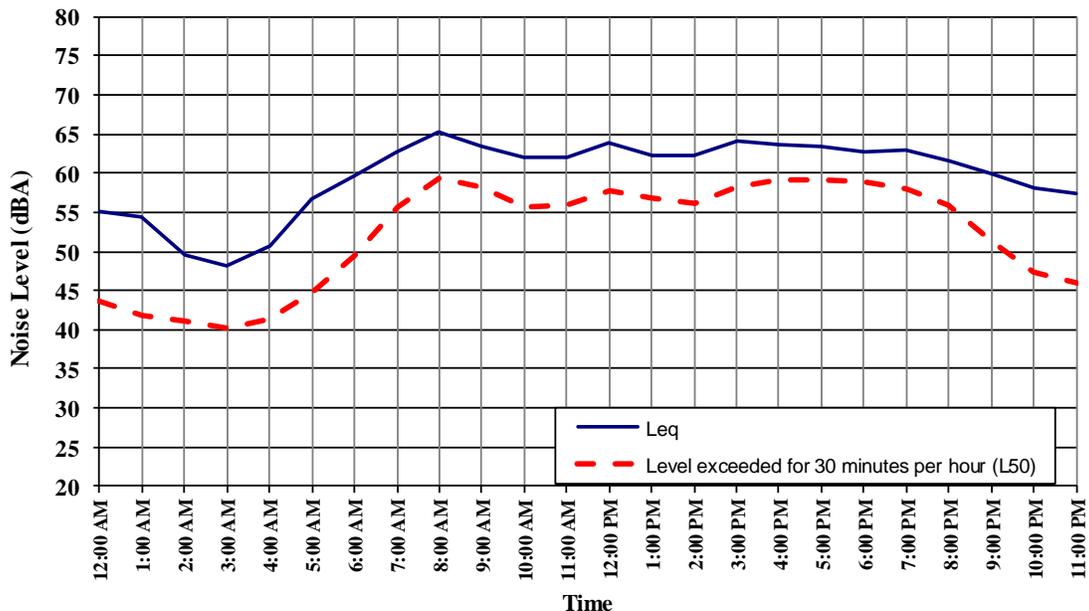


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S8  
**Location Description:** 526 Eighth St.  
**Start Date:** 8/14/2012      **Run Time:** 2 Days  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	55.0	43.6	12:00 PM	63.8	57.7
1:00 AM	54.5	41.8	1:00 PM	62.2	56.9
2:00 AM	49.6	41.2	2:00 PM	62.4	56.1
3:00 AM	48.2	40.2	3:00 PM	64.2	58.2
4:00 AM	50.8	41.3	4:00 PM	63.7	59.2
5:00 AM	56.7	44.8	5:00 PM	63.5	59.2
6:00 AM	59.6	49.5	6:00 PM	62.6	58.8
7:00 AM	62.7	55.8	7:00 PM	63.0	58.0
8:00 AM	65.1	59.3	8:00 PM	61.5	55.8
9:00 AM	63.5	58.1	9:00 PM	59.9	51.2
10:00 AM	62.1	55.7	10:00 PM	58.1	47.5
11:00 AM	61.9	55.8	11:00 PM	57.4	46.0

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 63.3  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 58.7



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## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S9

**Location Description:** 560 Eighth St.

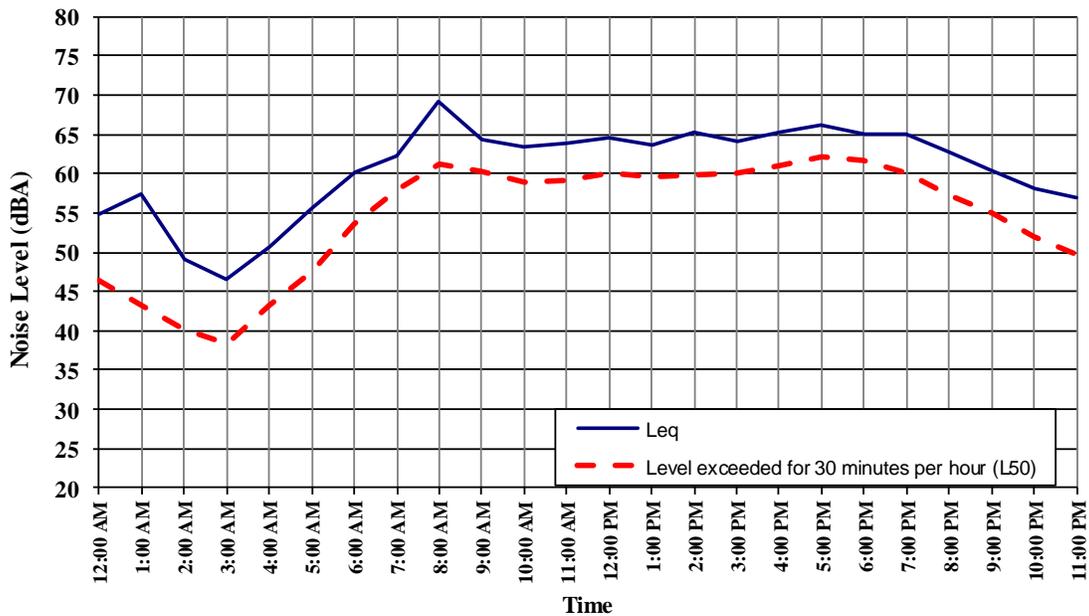
**Start Date:** 8/14/2012      **Run Time:** 2 Days

**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	54.9	46.5	12:00 PM	64.7	60.0
1:00 AM	57.4	43.2	1:00 PM	63.6	59.6
2:00 AM	49.2	40.1	2:00 PM	65.2	59.8
3:00 AM	46.5	38.3	3:00 PM	64.0	60.1
4:00 AM	50.7	43.2	4:00 PM	65.2	61.0
5:00 AM	55.5	47.5	5:00 PM	66.1	62.1
6:00 AM	60.2	53.7	6:00 PM	65.0	61.6
7:00 AM	62.2	57.9	7:00 PM	64.9	60.0
8:00 AM	69.1	61.3	8:00 PM	62.8	57.4
9:00 AM	64.3	60.2	9:00 PM	60.5	55.0
10:00 AM	63.3	59.0	10:00 PM	58.1	51.9
11:00 AM	63.9	59.2	11:00 PM	56.8	49.6

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 65.3

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 59.4



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

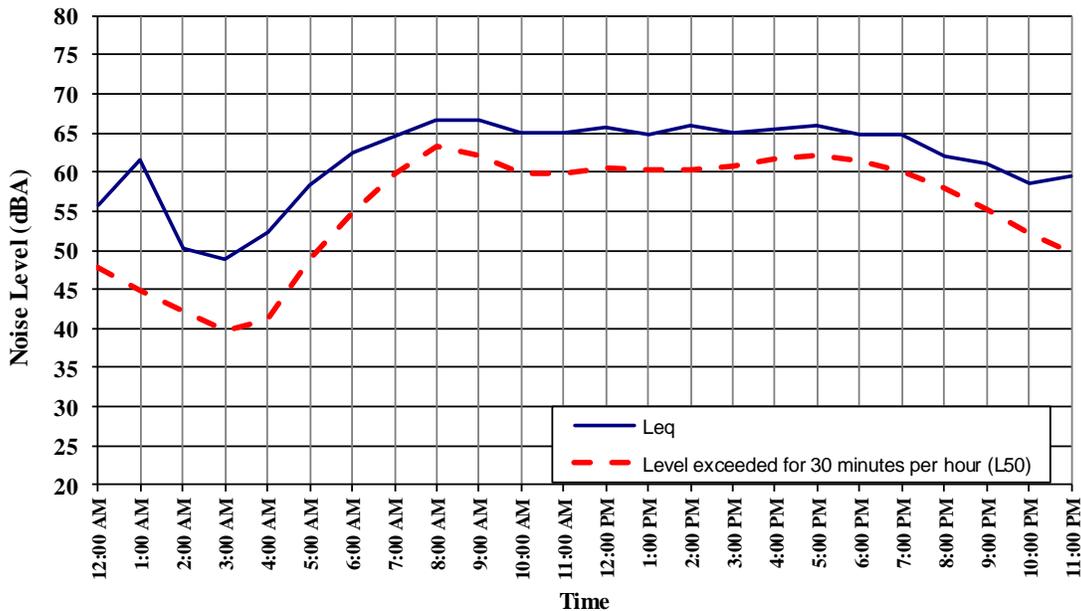


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S10  
**Location Description:** 601 Eighth St.  
**Start Date:** 8/14/2012      **Run Time:** 2 Days  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	55.7	47.8	12:00 PM	65.7	60.6
1:00 AM	61.5	44.8	1:00 PM	64.8	60.2
2:00 AM	50.3	42.2	2:00 PM	65.9	60.3
3:00 AM	48.8	39.8	3:00 PM	65.0	60.8
4:00 AM	52.3	41.0	4:00 PM	65.5	61.7
5:00 AM	58.4	49.1	5:00 PM	65.9	62.1
6:00 AM	62.5	54.7	6:00 PM	64.8	61.4
7:00 AM	64.5	59.8	7:00 PM	64.7	60.1
8:00 AM	66.7	63.2	8:00 PM	62.0	58.0
9:00 AM	66.7	62.0	9:00 PM	61.0	55.3
10:00 AM	65.1	59.9	10:00 PM	58.5	52.2
11:00 AM	65.1	59.9	11:00 PM	59.4	49.8

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 65.6  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 60.6



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

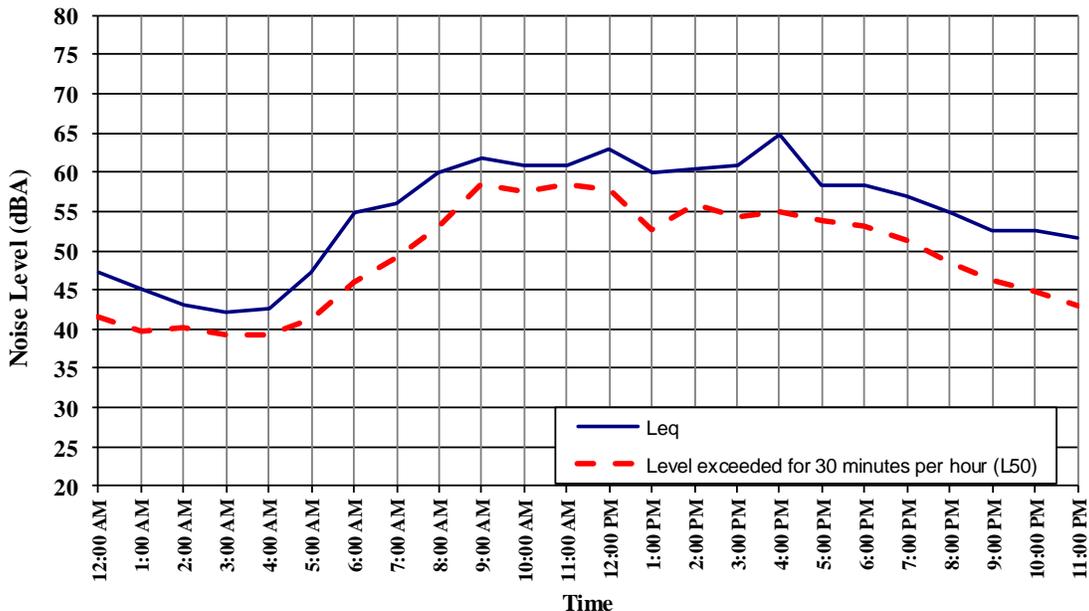


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S11  
**Location Description:** 600 Sixth St.  
**Start Date:** 8/14/2012      **Run Time:** 2 Days  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	47.3	41.7	12:00 PM	62.9	57.7
1:00 AM	45.0	39.8	1:00 PM	59.9	52.6
2:00 AM	43.0	40.2	2:00 PM	60.3	55.8
3:00 AM	42.1	39.3	3:00 PM	60.8	54.3
4:00 AM	42.5	39.3	4:00 PM	64.8	54.9
5:00 AM	47.3	41.4	5:00 PM	58.4	53.9
6:00 AM	54.9	45.9	6:00 PM	58.4	53.2
7:00 AM	56.1	49.2	7:00 PM	56.8	51.2
8:00 AM	60.0	53.0	8:00 PM	55.0	48.5
9:00 AM	61.7	58.5	9:00 PM	52.5	46.1
10:00 AM	60.8	57.5	10:00 PM	52.6	44.7
11:00 AM	60.9	58.4	11:00 PM	51.6	43.0

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 61.2  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 52.3



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Acoustics, Noise and Vibration Consultants



## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S12

**Location Description:** Ardmore Park

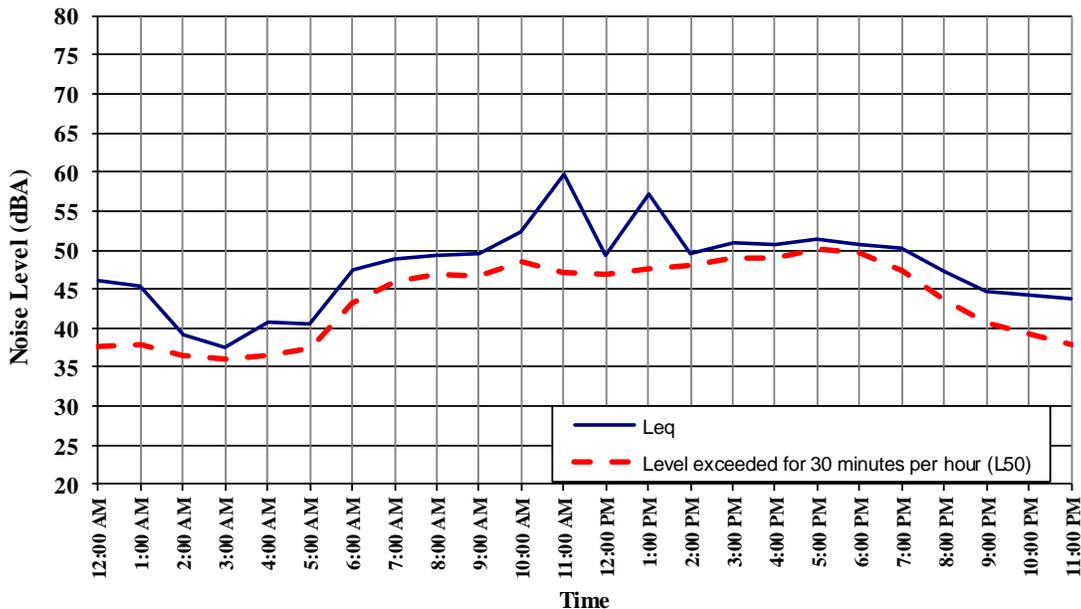
**Start Date:** 8/28/2012      **Run Time:** 2 Days

**Start Time:** 1:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	46.0	37.7	12:00 PM	49.4	47.0
1:00 AM	45.4	38.0	1:00 PM	57.1	47.6
2:00 AM	39.0	36.5	2:00 PM	49.6	48.0
3:00 AM	37.6	36.0	3:00 PM	50.9	48.9
4:00 AM	40.8	36.5	4:00 PM	50.8	49.1
5:00 AM	40.6	37.3	5:00 PM	51.3	50.2
6:00 AM	47.4	43.1	6:00 PM	50.7	49.6
7:00 AM	48.8	45.9	7:00 PM	50.1	47.4
8:00 AM	49.3	46.9	8:00 PM	47.2	43.7
9:00 AM	49.6	46.6	9:00 PM	44.6	40.8
10:00 AM	52.3	48.4	10:00 PM	44.3	39.2
11:00 AM	59.8	47.1	11:00 PM	43.7	37.9

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 53.5

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 45.6



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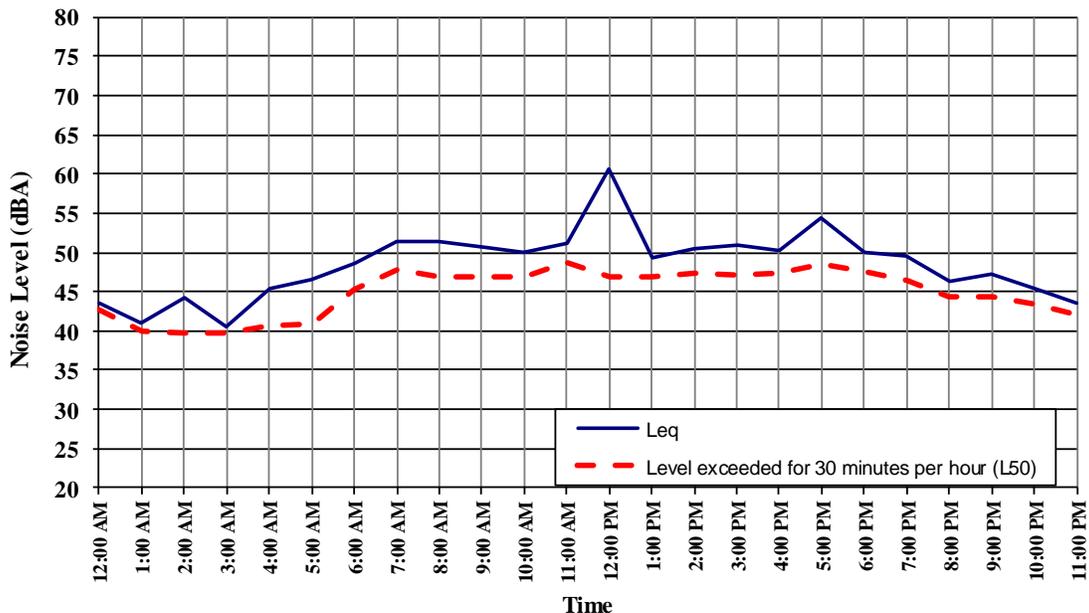


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S13  
**Location Description:** Southwest property line of City Hall  
**Start Date:** 8/21/2012      **Run Time:** 2 Days  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	43.5	42.7	12:00 PM	60.5	46.9
1:00 AM	41.0	39.9	1:00 PM	49.3	46.9
2:00 AM	44.1	39.7	2:00 PM	50.5	47.4
3:00 AM	40.5	39.7	3:00 PM	51.0	47.2
4:00 AM	45.5	40.7	4:00 PM	50.3	47.3
5:00 AM	46.4	40.9	5:00 PM	54.4	48.6
6:00 AM	48.7	45.2	6:00 PM	50.1	47.6
7:00 AM	51.4	47.8	7:00 PM	49.6	46.5
8:00 AM	51.5	46.8	8:00 PM	46.3	44.4
9:00 AM	50.8	46.8	9:00 PM	47.2	44.4
10:00 AM	50.1	47.0	10:00 PM	45.3	43.3
11:00 AM	51.2	48.7	11:00 PM	43.4	42.1

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 53.4  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 46.7



# Behrens and Associates, Inc.

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## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** S14

**Location Description:** 1107 Valley Dr.

**Start Date:** 8/8/2012      **Run Time:** 2 Days

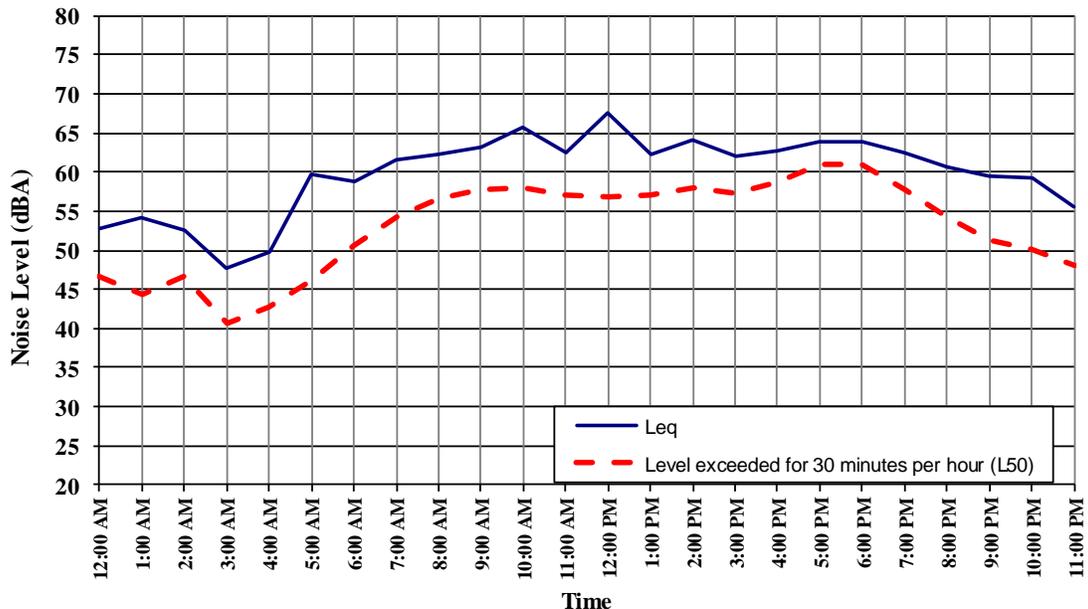
**Start Time:** 11:00 AM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	52.8	46.7	12:00 PM	67.6	56.8
1:00 AM	54.2	44.3	1:00 PM	62.1	57.0
2:00 AM	52.6	46.7	2:00 PM	64.1	57.9
3:00 AM	47.6	40.5	3:00 PM	62.1	57.3
4:00 AM	49.7	42.6	4:00 PM	62.7	58.7
5:00 AM	59.6	46.2	5:00 PM	63.8	61.1
6:00 AM	58.7	50.6	6:00 PM	63.8	60.9
7:00 AM	61.5	54.2	7:00 PM	62.5	57.8
8:00 AM	62.1	56.6	8:00 PM	60.5	54.3
9:00 AM	63.1	57.8	9:00 PM	59.6	51.3
10:00 AM	65.7	57.9	10:00 PM	59.1	50.2
11:00 AM	62.5	57.1	11:00 PM	55.6	48.1

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 64.0

**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 58.3

**CNEL** 65.1



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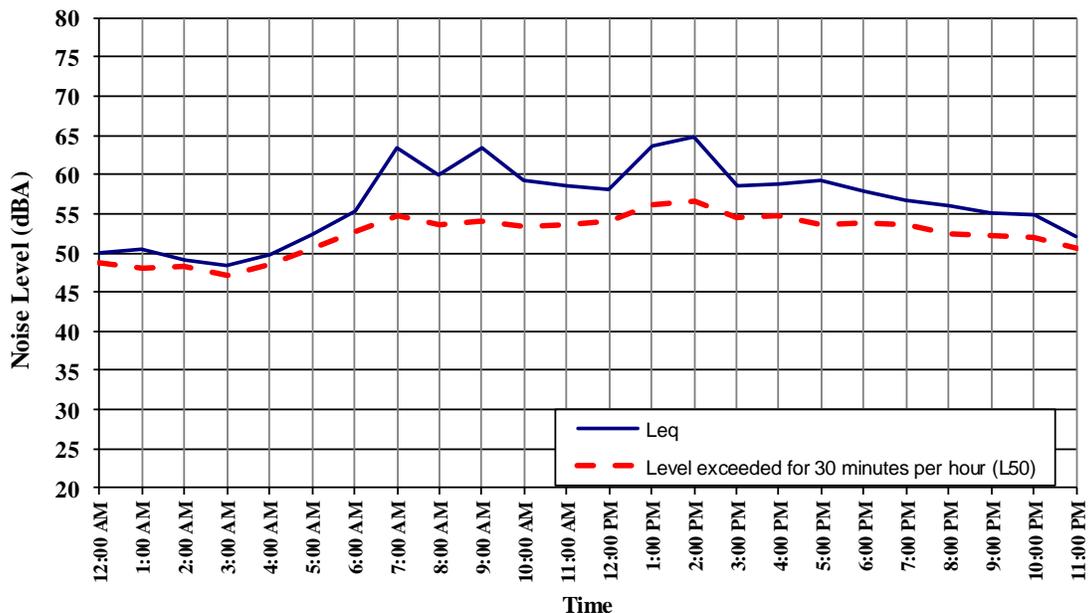


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** S15  
**Location Description:** 929 First St.  
**Start Date:** 8/14/2012      **Run Time:** 2 Days  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA					
Time	L <sub>eq</sub>	L <sub>50</sub>	Time	L <sub>eq</sub>	L <sub>50</sub>
12:00 AM	50.1	48.6	12:00 PM	58.0	54.1
1:00 AM	50.6	48.0	1:00 PM	63.7	56.2
2:00 AM	49.0	48.2	2:00 PM	64.7	56.7
3:00 AM	48.3	47.1	3:00 PM	58.5	54.5
4:00 AM	49.8	48.5	4:00 PM	58.9	54.7
5:00 AM	52.4	50.7	5:00 PM	59.2	53.5
6:00 AM	55.4	52.7	6:00 PM	57.8	53.8
7:00 AM	63.5	54.8	7:00 PM	56.6	53.6
8:00 AM	60.0	53.7	8:00 PM	56.0	52.5
9:00 AM	63.4	54.0	9:00 PM	55.1	52.2
10:00 AM	59.4	53.4	10:00 PM	54.8	51.9
11:00 AM	58.5	53.6	11:00 PM	52.1	50.6

**Daytime (8 AM to 7 PM) Average Noise Level, dBA** 60.9  
**Nighttime (7 PM to 8 AM) Average Noise Level, dBA** 55.7



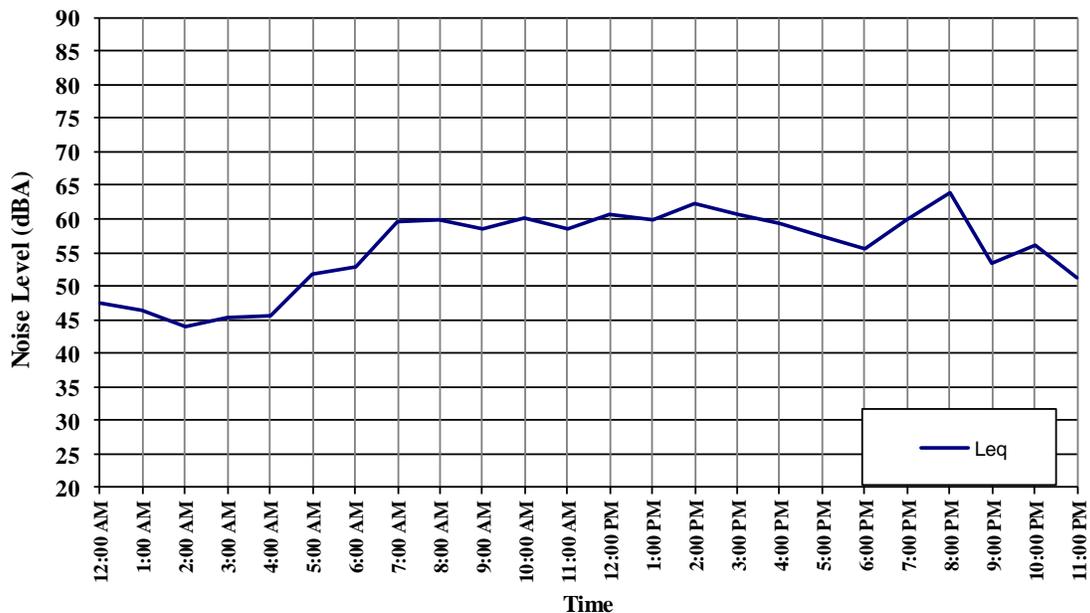


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T1  
**Location Description:** 6th St. and Cypress St.  
**Start Date:** 8/8/2012      **Run Time** 2 Days  
**Start Time:** 11:00 AM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	47.5	12:00 PM	60.7
1:00 AM	46.3	1:00 PM	59.9
2:00 AM	43.9	2:00 PM	62.2
3:00 AM	45.3	3:00 PM	60.6
4:00 AM	45.5	4:00 PM	59.2
5:00 AM	51.9	5:00 PM	57.5
6:00 AM	52.9	6:00 PM	55.5
7:00 AM	59.5	7:00 PM	59.9
8:00 AM	59.9	8:00 PM	63.8
9:00 AM	58.6	9:00 PM	53.4
10:00 AM	60.1	10:00 PM	56.0
11:00 AM	58.4	11:00 PM	51.3

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 59.9  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 50.8  
**CNEL** 61.4



# Behrens and Associates, Inc.

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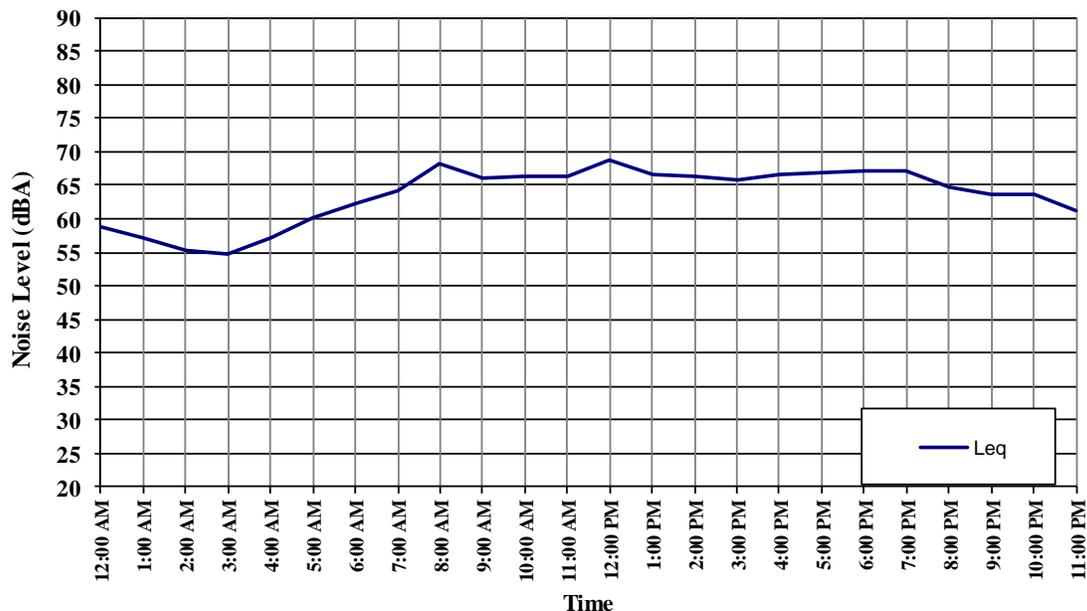


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T2  
**Location Description:** 531 Herondo St.  
**Start Date:** 8/8/2012      **Run Time** 1 Day  
**Start Time:** 12:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	58.9	12:00 PM	68.8
1:00 AM	57.2	1:00 PM	66.7
2:00 AM	55.4	2:00 PM	66.2
3:00 AM	54.8	3:00 PM	65.7
4:00 AM	57.2	4:00 PM	66.7
5:00 AM	60.0	5:00 PM	66.8
6:00 AM	62.4	6:00 PM	67.0
7:00 AM	64.2	7:00 PM	67.1
8:00 AM	68.1	8:00 PM	64.6
9:00 AM	66.1	9:00 PM	63.6
10:00 AM	66.4	10:00 PM	63.5
11:00 AM	66.3	11:00 PM	61.3

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 66.5  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 59.9  
**CNEL** 68.7



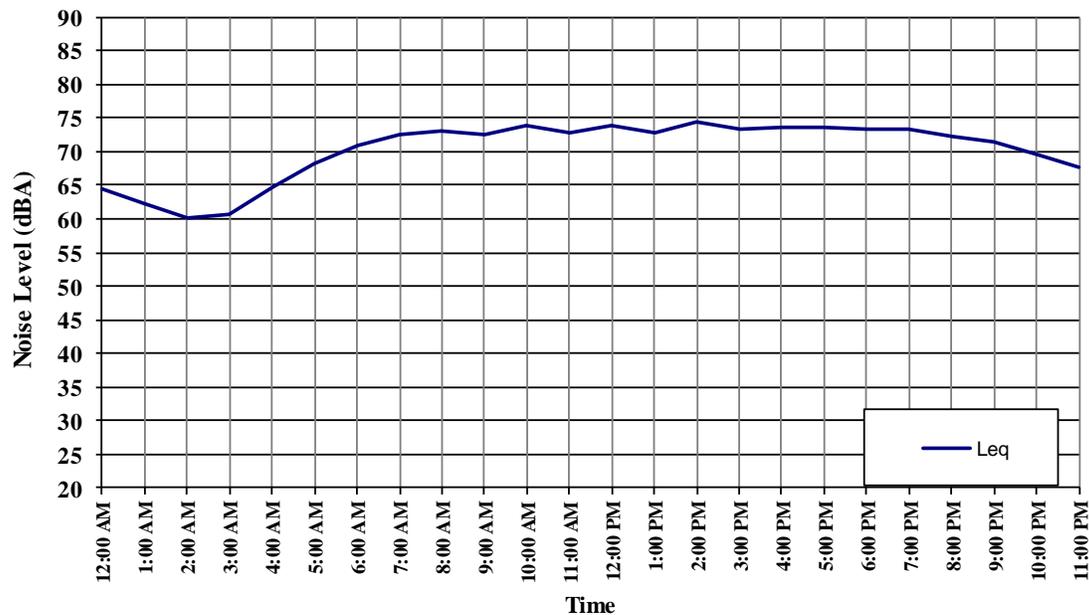


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T3  
**Location Description:** 426 Anita St.  
**Start Date:** 8/8/2012      **Run Time** 1 Day  
**Start Time:** 4:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	64.4	12:00 PM	73.9
1:00 AM	62.3	1:00 PM	72.9
2:00 AM	60.1	2:00 PM	74.5
3:00 AM	60.6	3:00 PM	73.3
4:00 AM	64.6	4:00 PM	73.5
5:00 AM	68.1	5:00 PM	73.7
6:00 AM	70.9	6:00 PM	73.4
7:00 AM	72.5	7:00 PM	73.4
8:00 AM	73.1	8:00 PM	72.2
9:00 AM	72.4	9:00 PM	71.3
10:00 AM	73.8	10:00 PM	69.5
11:00 AM	72.7	11:00 PM	67.5

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 73.2  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 66.8  
**CNEL** 75.5



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants



## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** T4

**Location Description:** 1107 Valley Dr.

**Start Date:** 8/8/2012      **Run Time** 2 Days

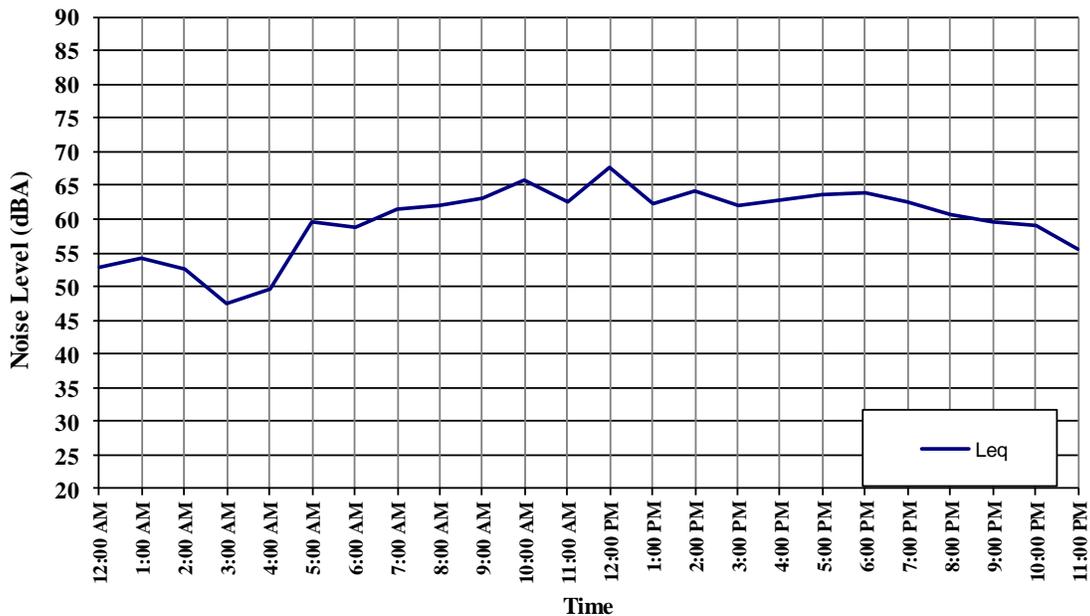
**Start Time:** 11:00 AM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	52.8	12:00 PM	67.6
1:00 AM	54.2	1:00 PM	62.1
2:00 AM	52.6	2:00 PM	64.1
3:00 AM	47.6	3:00 PM	62.1
4:00 AM	49.7	4:00 PM	62.7
5:00 AM	59.6	5:00 PM	63.8
6:00 AM	58.7	6:00 PM	63.8
7:00 AM	61.5	7:00 PM	62.5
8:00 AM	62.1	8:00 PM	60.5
9:00 AM	63.1	9:00 PM	59.6
10:00 AM	65.7	10:00 PM	59.1
11:00 AM	62.5	11:00 PM	55.6

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 63.4

**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 56.0

**CNEL** 65.1



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants



## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** T5

**Location Description:** 201 Valley Dr.

**Start Date:** 8/8/2012      **Run Time** 1 Day

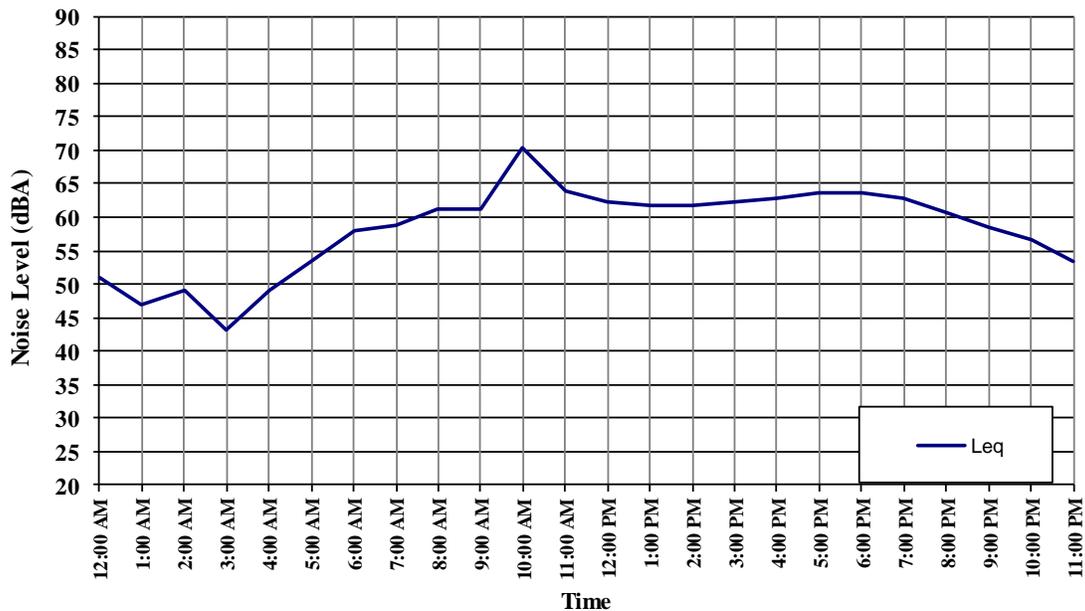
**Start Time:** 4:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	51.1	12:00 PM	62.2
1:00 AM	46.8	1:00 PM	61.8
2:00 AM	49.1	2:00 PM	61.6
3:00 AM	43.1	3:00 PM	62.1
4:00 AM	49.0	4:00 PM	62.7
5:00 AM	53.4	5:00 PM	63.6
6:00 AM	57.9	6:00 PM	63.8
7:00 AM	58.7	7:00 PM	62.7
8:00 AM	61.3	8:00 PM	60.6
9:00 AM	61.3	9:00 PM	58.5
10:00 AM	70.4	10:00 PM	56.7
11:00 AM	63.9	11:00 PM	53.4

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 63.5

**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 53.2

**CNEL** 64.0





## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** T6

**Location Description:** 1556 Prospect Ave.

**Start Date:** 8/8/2012      **Run Time** 1 Day

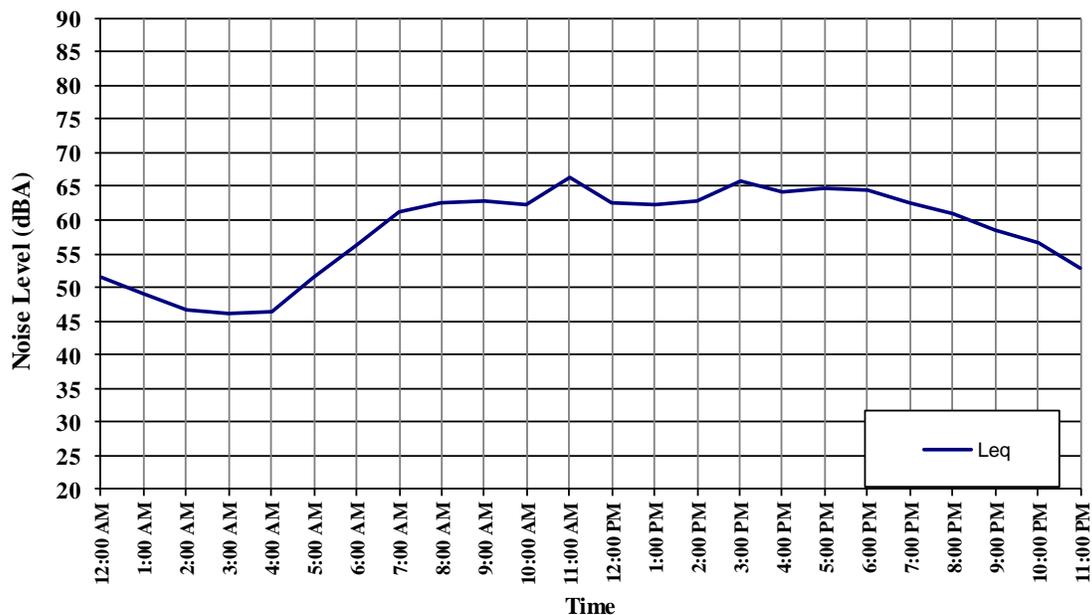
**Start Time:** 3:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	51.4	12:00 PM	62.5
1:00 AM	49.2	1:00 PM	62.1
2:00 AM	46.7	2:00 PM	62.7
3:00 AM	46.0	3:00 PM	65.6
4:00 AM	46.4	4:00 PM	64.2
5:00 AM	51.5	5:00 PM	64.6
6:00 AM	56.4	6:00 PM	64.5
7:00 AM	61.2	7:00 PM	62.6
8:00 AM	62.5	8:00 PM	61.0
9:00 AM	62.7	9:00 PM	58.4
10:00 AM	62.3	10:00 PM	56.7
11:00 AM	66.4	11:00 PM	52.9

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 63.3

**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 52.5

**CNEL** 63.7



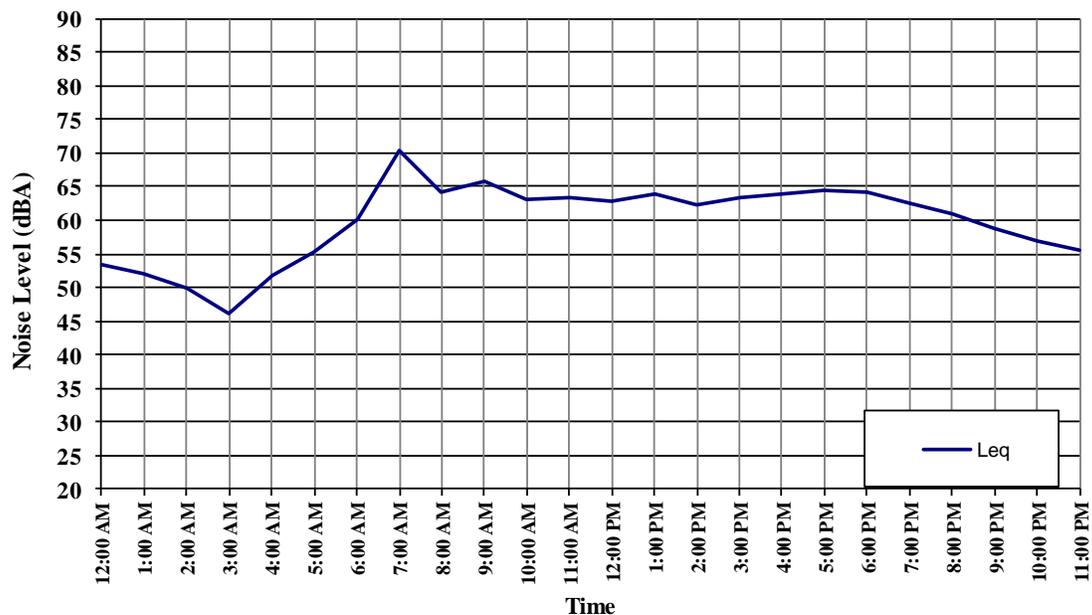


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T7  
**Location Description:** Prospect Ave and Gentry St. Intersection  
**Start Date:** 8/8/2012      **Run Time** 1 Day  
**Start Time:** 11:00 AM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	53.5	12:00 PM	62.7
1:00 AM	52.0	1:00 PM	63.9
2:00 AM	49.9	2:00 PM	62.3
3:00 AM	46.0	3:00 PM	63.4
4:00 AM	51.7	4:00 PM	63.9
5:00 AM	55.4	5:00 PM	64.3
6:00 AM	60.0	6:00 PM	64.2
7:00 AM	70.4	7:00 PM	62.5
8:00 AM	64.3	8:00 PM	60.8
9:00 AM	65.8	9:00 PM	58.9
10:00 AM	63.1	10:00 PM	56.9
11:00 AM	63.3	11:00 PM	55.6

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 64.4  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 55.1  
**CNEL** 65.1



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

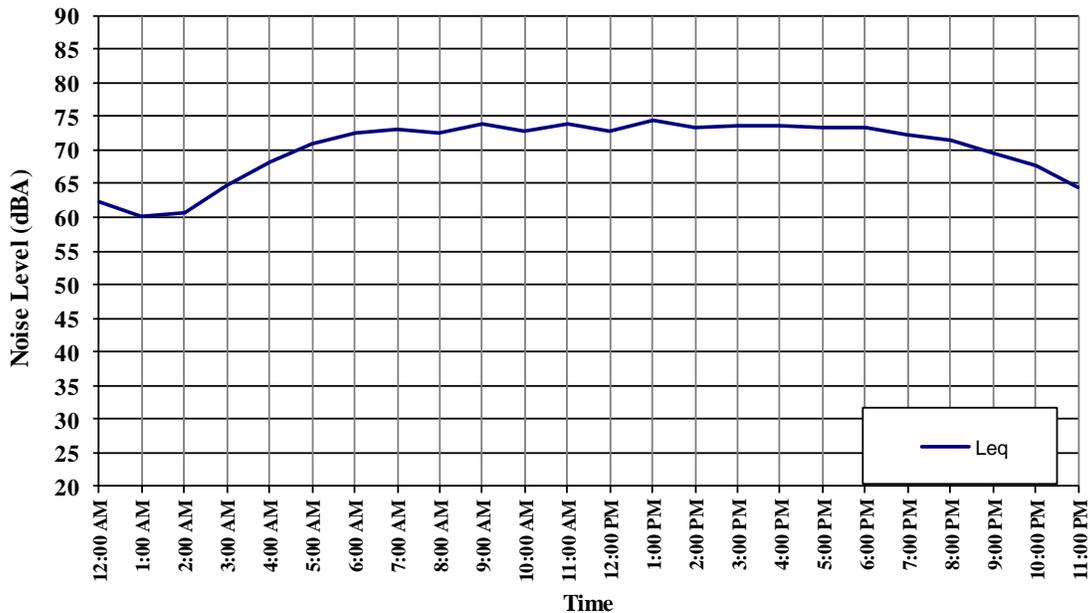


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T8  
**Location Description:** 752 Pier Ave.  
**Start Date:** 8/8/2012      **Run Time** 1 Day  
**Start Time:** 3:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	62.3	12:00 PM	72.9
1:00 AM	60.1	1:00 PM	74.5
2:00 AM	60.6	2:00 PM	73.3
3:00 AM	64.6	3:00 PM	73.5
4:00 AM	68.1	4:00 PM	73.7
5:00 AM	70.9	5:00 PM	73.4
6:00 AM	72.5	6:00 PM	73.4
7:00 AM	73.1	7:00 PM	72.2
8:00 AM	72.4	8:00 PM	71.3
9:00 AM	73.8	9:00 PM	69.5
10:00 AM	72.7	10:00 PM	67.5
11:00 AM	73.9	11:00 PM	64.4

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 73.1  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 67.6  
**CNEL** 75.8



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

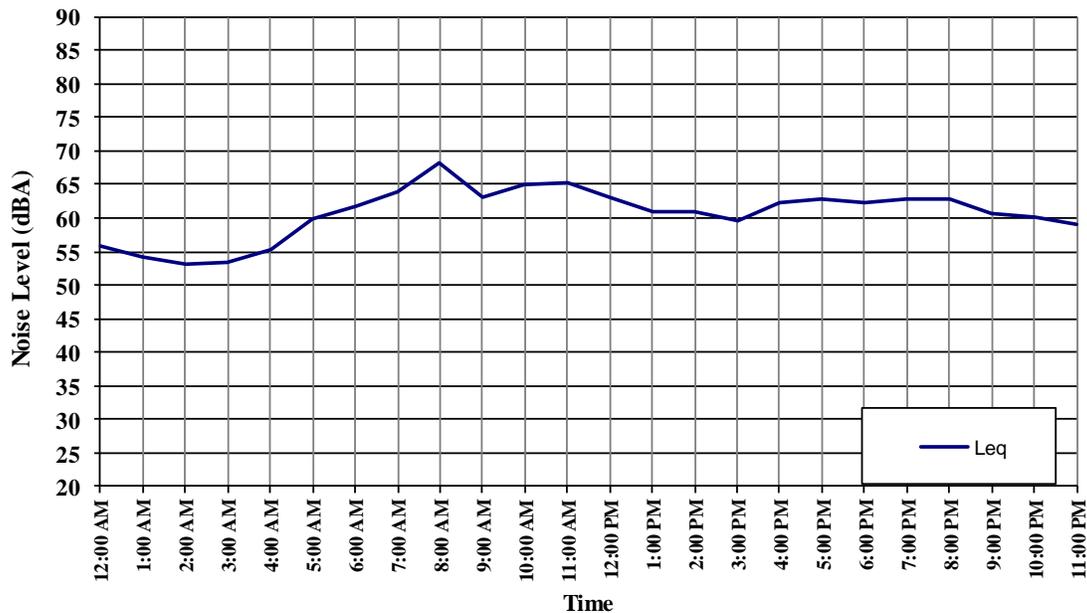


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T9  
**Location Description:** 1213 Owasso Ave.  
**Start Date:** 8/8/2012      **Run Time** 1 Day  
**Start Time:** 4:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	55.8	12:00 PM	63.0
1:00 AM	54.3	1:00 PM	60.9
2:00 AM	53.1	2:00 PM	60.9
3:00 AM	53.3	3:00 PM	59.5
4:00 AM	55.3	4:00 PM	62.3
5:00 AM	59.7	5:00 PM	62.7
6:00 AM	61.6	6:00 PM	62.3
7:00 AM	63.8	7:00 PM	62.8
8:00 AM	68.2	8:00 PM	62.9
9:00 AM	63.1	9:00 PM	60.7
10:00 AM	65.0	10:00 PM	60.1
11:00 AM	65.2	11:00 PM	59.0

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 63.4  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 58.0  
**CNEL** 66.2



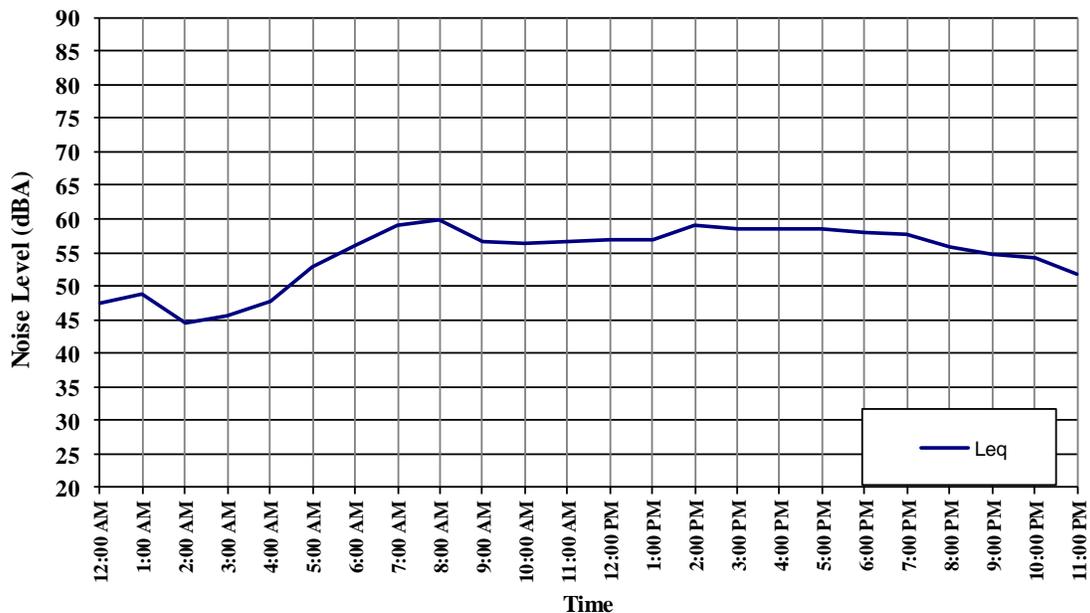


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T10  
**Location Description:** 1228 Agate St. Redondo Beach  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 11:00 AM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	47.5	12:00 PM	56.9
1:00 AM	48.9	1:00 PM	56.9
2:00 AM	44.4	2:00 PM	58.9
3:00 AM	45.6	3:00 PM	58.6
4:00 AM	47.8	4:00 PM	58.5
5:00 AM	53.0	5:00 PM	58.5
6:00 AM	56.2	6:00 PM	58.0
7:00 AM	59.1	7:00 PM	57.7
8:00 AM	59.7	8:00 PM	55.8
9:00 AM	56.7	9:00 PM	54.6
10:00 AM	56.2	10:00 PM	54.2
11:00 AM	56.7	11:00 PM	51.7

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 57.7  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 51.5  
**CNEL** 60.1



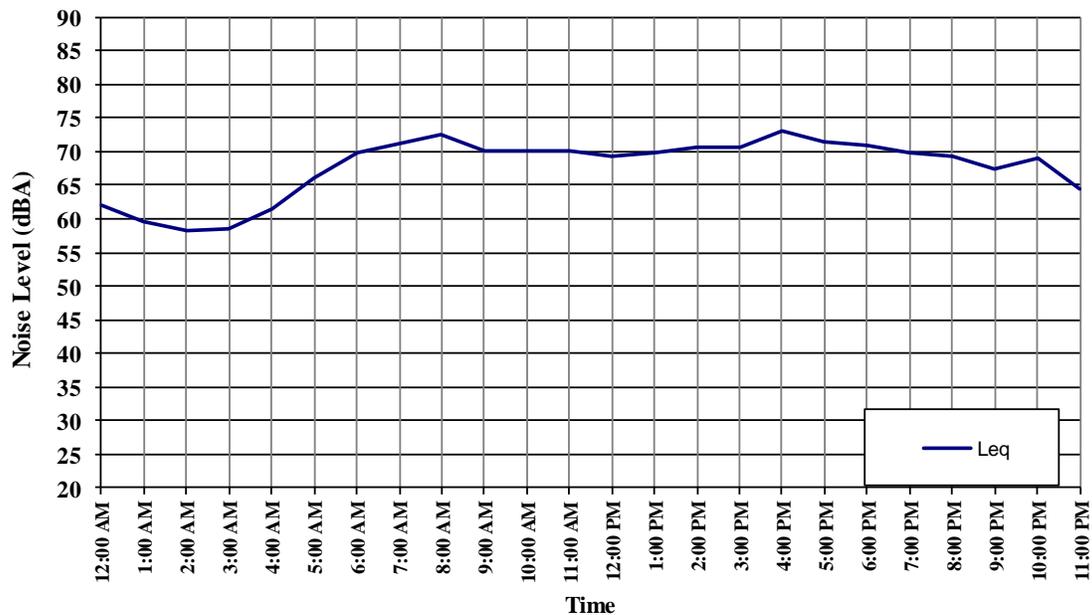


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T11  
**Location Description:** 5410 W. 190th St. Torrance  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 12:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	62.0	12:00 PM	69.3
1:00 AM	59.7	1:00 PM	69.7
2:00 AM	58.3	2:00 PM	70.5
3:00 AM	58.6	3:00 PM	70.5
4:00 AM	61.5	4:00 PM	73.1
5:00 AM	65.9	5:00 PM	71.4
6:00 AM	69.7	6:00 PM	70.9
7:00 AM	71.0	7:00 PM	69.7
8:00 AM	72.4	8:00 PM	69.3
9:00 AM	70.1	9:00 PM	67.3
10:00 AM	70.1	10:00 PM	68.9
11:00 AM	70.1	11:00 PM	64.5

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 70.6  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 65.1  
**CNEL** 73.3



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants



## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach

**Location No.:** T12

**Location Description:** 4777 W. 191st St. Torrance

**Start Date:** 9/18/2012      **Run Time** 1 Day

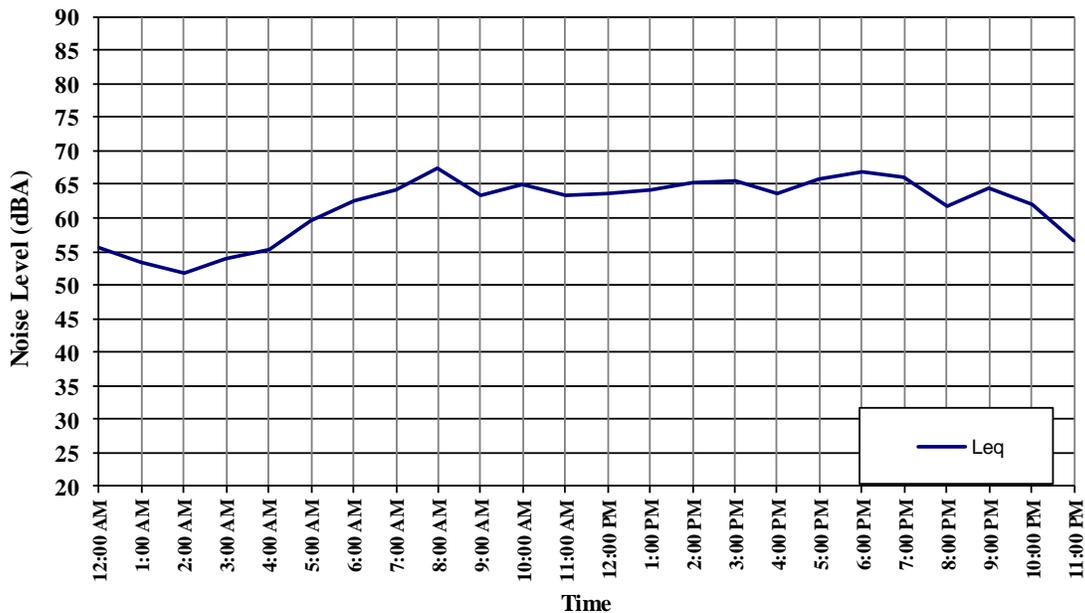
**Start Time:** 12:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	55.6	12:00 PM	63.6
1:00 AM	53.4	1:00 PM	64.1
2:00 AM	51.8	2:00 PM	65.2
3:00 AM	54.0	3:00 PM	65.4
4:00 AM	55.2	4:00 PM	63.6
5:00 AM	59.5	5:00 PM	65.7
6:00 AM	62.6	6:00 PM	66.8
7:00 AM	64.3	7:00 PM	66.0
8:00 AM	67.3	8:00 PM	61.8
9:00 AM	63.3	9:00 PM	64.5
10:00 AM	65.0	10:00 PM	62.1
11:00 AM	63.4	11:00 PM	56.6

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 64.9

**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 58.3

**CNEL** 67.2



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

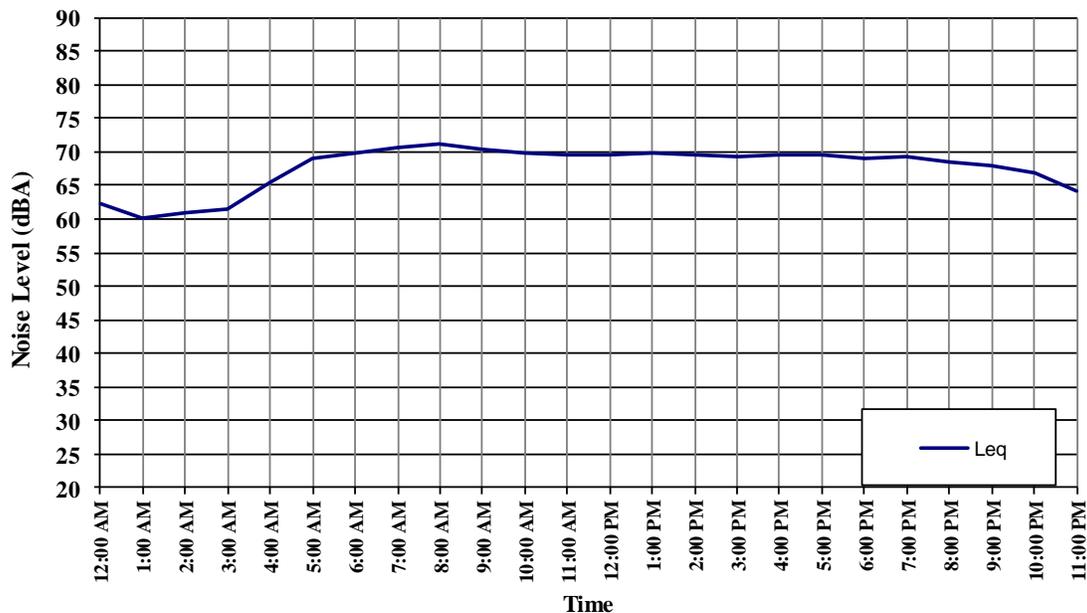


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T13  
**Location Description:** 4713 Towers St. Torrance  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	62.3	12:00 PM	69.7
1:00 AM	60.2	1:00 PM	69.8
2:00 AM	61.0	2:00 PM	69.6
3:00 AM	61.4	3:00 PM	69.2
4:00 AM	65.6	4:00 PM	69.6
5:00 AM	69.1	5:00 PM	69.7
6:00 AM	69.8	6:00 PM	69.1
7:00 AM	70.6	7:00 PM	69.3
8:00 AM	71.3	8:00 PM	68.4
9:00 AM	70.4	9:00 PM	68.0
10:00 AM	69.7	10:00 PM	66.8
11:00 AM	69.5	11:00 PM	64.0

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 69.7  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 65.8  
**CNEL** 73.4



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

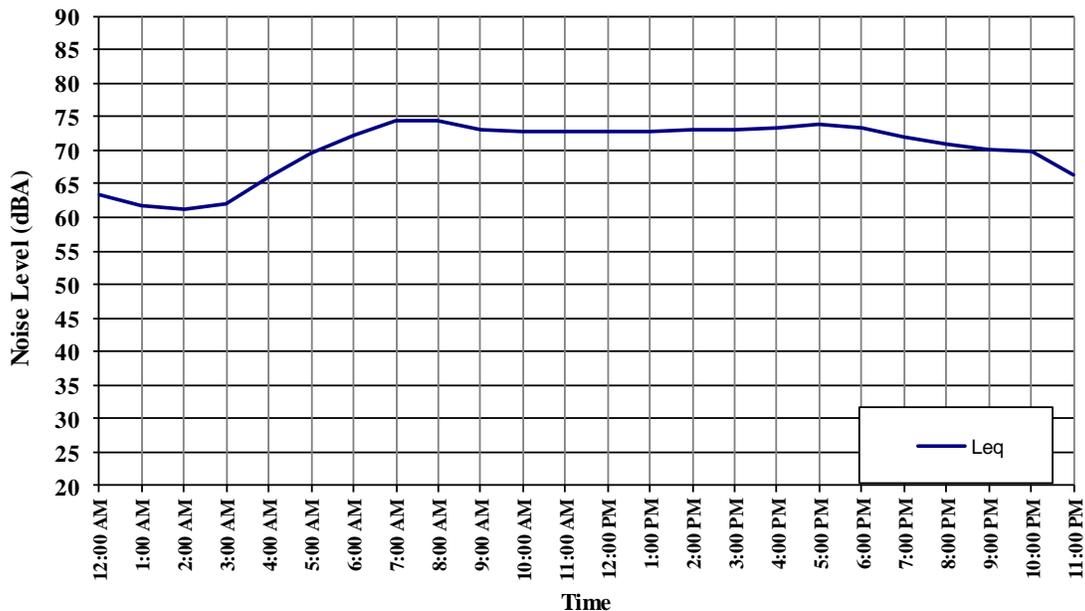


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T14  
**Location Description:** 4305 W. 190th St. Torrance  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 3:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	63.4	12:00 PM	72.9
1:00 AM	61.7	1:00 PM	72.9
2:00 AM	61.3	2:00 PM	73.1
3:00 AM	62.0	3:00 PM	73.1
4:00 AM	66.1	4:00 PM	73.3
5:00 AM	69.5	5:00 PM	73.9
6:00 AM	72.1	6:00 PM	73.3
7:00 AM	74.5	7:00 PM	72.1
8:00 AM	74.3	8:00 PM	70.9
9:00 AM	73.1	9:00 PM	70.1
10:00 AM	72.7	10:00 PM	69.8
11:00 AM	72.7	11:00 PM	66.3

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 73.0  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 67.4  
**CNEL** 75.6



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

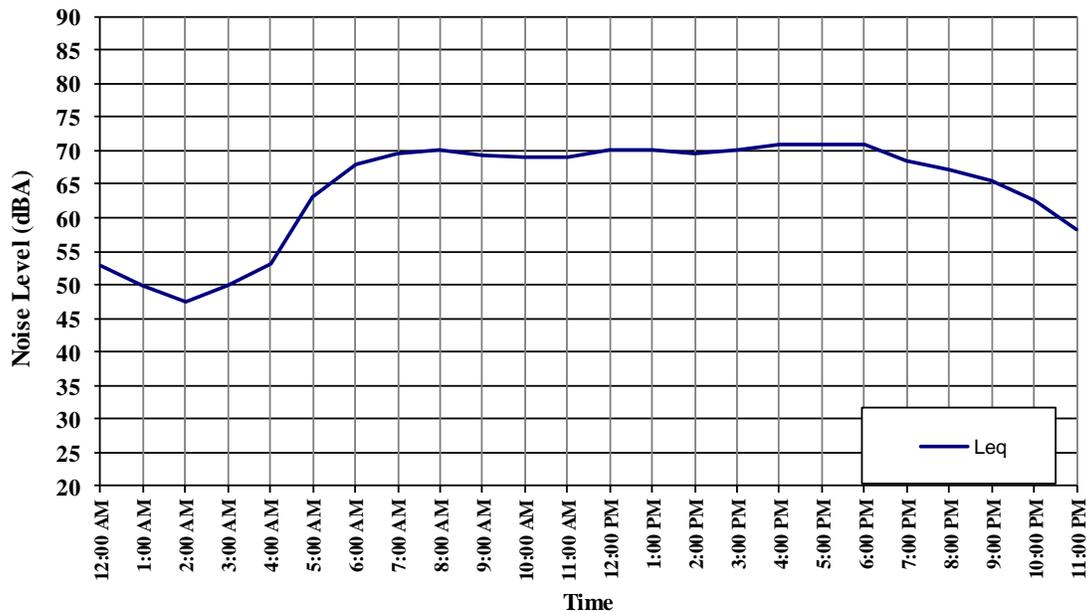


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T15  
**Location Description:** 4100 W. 185 St. Torrance  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 3:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	52.9	12:00 PM	70.0
1:00 AM	50.0	1:00 PM	70.0
2:00 AM	47.5	2:00 PM	69.6
3:00 AM	50.0	3:00 PM	70.0
4:00 AM	53.2	4:00 PM	71.0
5:00 AM	63.0	5:00 PM	71.0
6:00 AM	68.1	6:00 PM	70.9
7:00 AM	69.6	7:00 PM	68.4
8:00 AM	70.2	8:00 PM	67.0
9:00 AM	69.4	9:00 PM	65.6
10:00 AM	69.0	10:00 PM	62.6
11:00 AM	68.9	11:00 PM	58.1

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 69.6  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 61.1  
**CNEL** 70.7



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

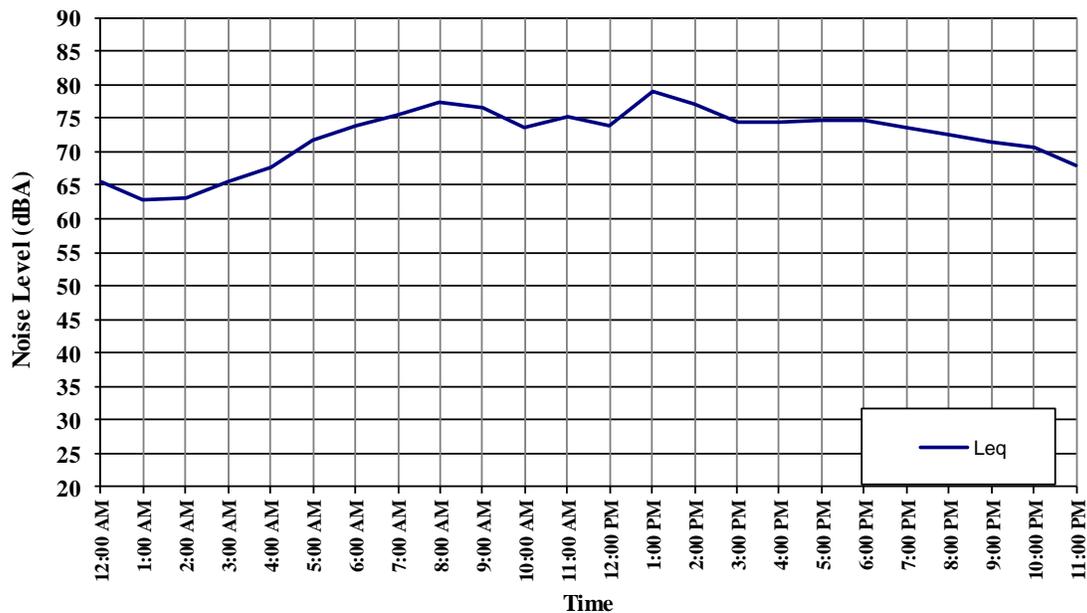


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T16  
**Location Description:** 3625 W. 190th St. Torrance  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 3:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	65.5	12:00 PM	73.7
1:00 AM	62.9	1:00 PM	78.9
2:00 AM	63.0	2:00 PM	77.0
3:00 AM	65.5	3:00 PM	74.4
4:00 AM	67.7	4:00 PM	74.5
5:00 AM	71.8	5:00 PM	74.7
6:00 AM	74.0	6:00 PM	74.7
7:00 AM	75.5	7:00 PM	73.7
8:00 AM	77.4	8:00 PM	72.5
9:00 AM	76.6	9:00 PM	71.5
10:00 AM	73.7	10:00 PM	70.6
11:00 AM	75.2	11:00 PM	67.8

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 75.3  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 69.2  
**CNEL** 77.6



# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants

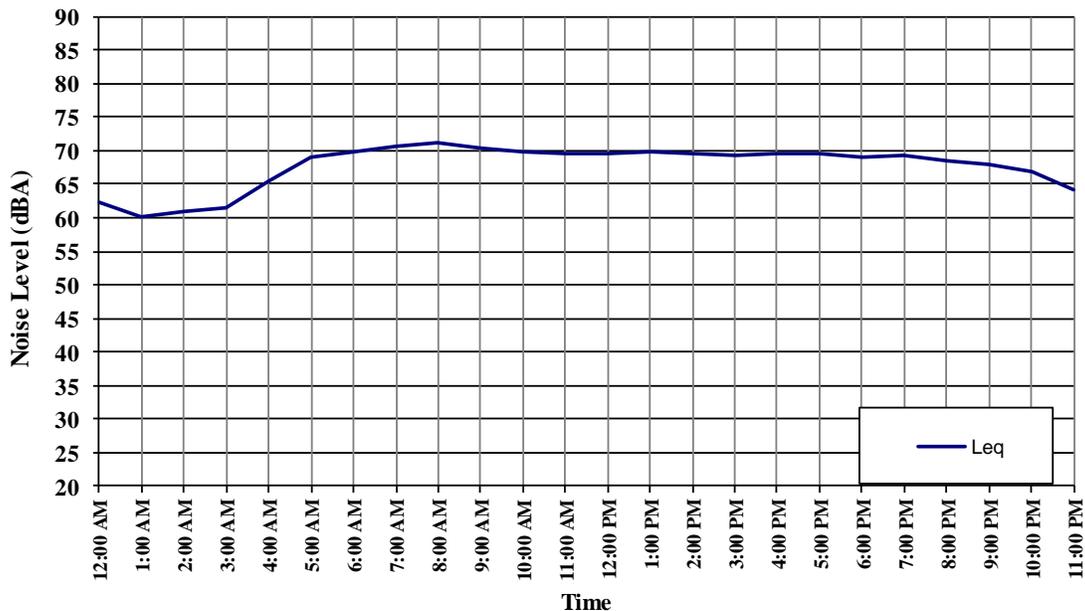


## Ambient Noise Measurement Report

**Project** E&B Oil Development Project, Hermosa Beach  
**Location No.:** T17  
**Location Description:** 18721 Crenshaw Blvd. Torrance  
**Start Date:** 9/18/2012      **Run Time** 1 Day  
**Start Time:** 2:00 PM

Hourly Noise Levels, Averaged over Run Time, dBA			
Time	L <sub>eq</sub>	Time	L <sub>eq</sub>
12:00 AM	62.3	12:00 PM	69.7
1:00 AM	60.2	1:00 PM	69.8
2:00 AM	61.0	2:00 PM	69.6
3:00 AM	61.4	3:00 PM	69.2
4:00 AM	65.6	4:00 PM	69.6
5:00 AM	69.1	5:00 PM	69.7
6:00 AM	69.8	6:00 PM	69.1
7:00 AM	70.6	7:00 PM	69.3
8:00 AM	71.3	8:00 PM	68.4
9:00 AM	70.4	9:00 PM	68.0
10:00 AM	69.7	10:00 PM	66.8
11:00 AM	69.5	11:00 PM	64.0

**Daytime (7 AM to 10 PM) Average Noise Level, dBA** 69.7  
**Nighttime (10 PM to 7 AM) Average Noise Level, dBA** 65.8  
**CNEL** 73.4





## **Appendix B**

### **Project Phase Schedules**













**Appendix C**

**Drilling Quiet Mode Plan**

## **Purpose of the Drilling Quiet Mode Plan**

The Drilling Quiet Mode period extends from 7 pm to 8 am, which is the nighttime period defined in the City of Hermosa Beach Oil Code.

The purpose of the Drilling Quiet Mode Plan is to identify methods that can be employed to prevent, reduce, or mitigate the noise generated by various drilling activities during the nighttime period. The Drilling Quiet Mode Plan will serve to minimize night time noise from drilling and prevent impacts to wellbeing and comfort of the surrounding community.

## **Drilling Noise Generating Activities**

Major noise sources associated with drilling activities are metal on metal contact, hydraulic power unit, electric motors, topdrive, mud mixers and shakers, cementing pumps, and warning devices such as backup alarms on vehicles or hydrogen sulfide or hydrocarbon monitors, and personnel yelling while communicating to each other across the drilling pad.

There are a number of metal to metal contact activities during drilling that have a potential to generate noise. These include using tongs to make up or break out drill pipe, clanging of elevators against drill pipe, clanging of drill pipe and casing against metal parts of the rig and tools while being transferred to and from trailers, pipe racks, and rig floor, while being pulled through the “V-door”, during making up the drill pipe or casing, and picking up various metal tools from the catwalk to the rig floor (such as cementing heads or pipe tongs).

## **Quiet Mode Measures**

To reduce the noise from drilling activities, the following mitigation will be implemented. This mode is referred to as “Drilling Quiet Mode” and required to be implemented during drilling operations at night. All service company or other subcontractors personnel shall be made aware of Quiet Mode operations.

The **Drilling Quiet Mode Period is 7 pm to 8 am** and includes:

### **A. Materials/Equipment**

- Cover V-door with rubber matting. Make sure the rubber matting stays on when handling pipe.
- Cover rig floor with rubber matting and wood.
- Place rubber matting or wood on the pipe racks and catwalk when rolling pipe off the pipe racks onto the catwalk.
- Use hydraulic tongs, instead of chain or pneumatic tongs.
- Wrap hammer wrenches with rags.
- Install sound barrier on the derrick at the “monkey board”.
- Install soundproofing blankets around drawworks, rig floor, mud pumps and substructure.
- Install sound wall at the perimeter of the drill pad between the rig and sensitive receptors.

## **B. Operations/Scheduling:**

- All drilling equipment shall be regularly serviced, maintained and repaired to minimize increases in noise output with time and to ensure that tonal noise from worn bearings, metal-on-metal contact, valves etc. is avoided.
- Minimize any banging of pipe on the catwalk by careful use of the forklift.
- Disable all audible mobile equipment and trucks backup alarms.
- Avoid operation of cellar pump, use vacuum trucks instead.
- Avoid cementing operations.
- Yelling should be avoided.
- Do not make noise in parking lots, or other non-work areas, no radios or other loud speaking devices are allowed to be operated/played during the Quiet Mode.
- All personnel communications, outside of emergencies, should either be done over walkie-talkies or other communication devices.
- No maintenance during the Quiet Mode is allowed unless it is an emergency operation.
- Do not use horns, whistles or other loud devices to signal or summon the crew.
- As much as practical, minimize handling pipe during the Quiet Mode period.
- As much as practical, minimize use of hammers and hammer wrenches during the Quiet Mode hours.
- No tripping should take place during the nighttime hours.
- When latching the elevators, lay the pipe in the elevators, latch slowly and as quietly as possible.
- When laying down drill pipe or casing, use the high line.
- When picking up pipe, set pipe on rubber mats on the “V-door”, and try to prevent hitting the pipe against the catwalk, V-door and other tools.
- No equipment, trucks, vac trucks, tools or materials shall be delivered to the drill site during Quiet Mode.

## **Quiet Mode Personnel Training**

To assure that the Quiet Mode measures are adhered to, prior to every drilling, redrilling or workover project, E&B will conduct employee and contractor awareness training which will include all applicable Quiet Mode procedures and the importance of strict compliance. Display the “Drilling Quiet Mode Flyer” at the location.

## **Compliance Assurance**

Prior to every drilling, redrilling or workover project, the site foreman will assign personnel to check implementation of the Quiet Mode measures and monitor the drill rig noise. The assigned personnel – Monitor (who can have other responsibilities) – would be responsible to verify the required measures are implemented. The Monitor will report any activities of noncompliance or

questionable compliance to the site foreman as soon as possible so that these situations can be immediately addressed.

**Ombudsperson(s)**

E&B Resources will also designate employees or authorized agents to serve as Ombudspersons to respond to questions and concerns relating to oil field operations, including noise complaints, if any. The Ombudsperson will be familiar with all conditions of approval related to permits and approvals issued by the City or other agencies. The Ombudsperson will also be responsible for facilitating, to the extent feasible, the prompt resolution of any issues that may arise relating to compliance matters or impacts of the oil development project operations.

# DRILLING QUIET MODE RULES

The drilling site is located in a highly sensitive area. Noise and nuisance complaints from neighbors could cause drilling to be shut down. This could cause loss of work to your company and loss of production for the drill site.

## DRILLING QUIET MODE: 7:00 PM to 8:00 AM

 <p><b>SHHH!</b> Keep noise down! Think before you start each job.</p>	<ul style="list-style-type: none"><li>• <b>THINK NO NOISE</b></li><li>• <b>THINK BEFORE YOU DO</b></li><li>• <b>OPERATE QUIETLY</b></li><li>• <b>IT'S EVERYONE'S JOB</b></li></ul>
---	--

- Minimize banging of pipe.
- Wrap hammers and hammer wrenches.
- No tripping during Drilling Quiet Mode.
- When latching the elevators, lay the pipe in the elevators, latch slowly and as quietly as possible.
- When laying down drill pipe or casing, use the high line.
- When picking up pipe, set pipe on rubber mats on the "V-door", and try to prevent hitting the pipe against the catwalk, V-door and other tools.
- No equipment, trucks, vac trucks, tools or materials should be delivered during Quiet Mode hours.
- No backup alarms.
- No horns, whistles or other loud devices to signal or summon the crew.
- No Yelling! Use Walkie-Talkies.
- No noise in parking lots, or other non-work areas.
- No radios or music during the Quiet Mode period.



**Appendix D**

**Traffic Noise Analysis Data**

# Behrens and Associates, Inc.

Acoustics, Noise and Vibration Consultants



Model Description: Sound32 Noise Prediction Model with California Vehicle Noise (CALVENO) Emission Levels  
 Analysis Scenario(s): Current Condition, Future without Project and Future with Project Traffic Volumes

Community Noise Descriptor: CNEL

Assumed 24-Hour Traffic Distribution:	MAJOR ROADWAYS			COLLECTOR ROADWAYS		
	Day	Evening	Night	Day	Evening	Night
Total ADT Volumes	69.50%	12.90%	9.60%	73.60%	13.60%	10.22%
Medium-Duty Trucks	1%	0.06%	1.50%	0.90%	0.04%	0.90%
Heavy-Duty Trucks	2.40%	0.10%	2.50%	0.35%	0.04%	0.35%

## Traffic Noise Levels

Roadway Name and Segment	Most Sensitive Land Use	Lanes	Median Width	ADT Volume	Speed Limit (MPH)	Dist. From Center to Receptor	Vehicle Mix		Existing CNEL, dBA	2016 Growth Factor	2016 w/out Project		2016 with Project		2035 Growth Factor	2035 w/out Project		2035 with Project	
							Medium Trucks	Heavy Trucks			CNEL, dBA	CNEL, dBA	CNEL, dBA	CNEL, dBA					
6th St from Valley Dr to Hermosa Ave	Commercial	2	0	806	25	26	1.8%	0.7%	56.0	1.0104	56.4	56.4	1.0488	56.5	56.5				
Artesia Blvd from East of Prospect Ave	Residential	4	18	21,580	35	46	3.0%	5.0%	76.3	1.0104	76.4	76.4	1.0488	76.5	76.5				
Artesia Blvd from Prospect Ave to PCH	Commercial	4	18	19,990	35	37	3.0%	5.0%	77.2	1.0104	77.3	77.3	1.0488	77.5	77.5				
Crenshaw Blvd from 190th St to I-405	Residential	4	12	52,317	35	48	3.0%	5.0%	79.6	1.0104	79.6	79.6	1.0488	79.8	79.8				
Herondo St./Anita St from Valley Dr. to PCH	Residential	4	18	10,764	35	46	3.0%	5.0%	72.7	1.0104	72.8	72.8	1.0488	72.9	72.9				
Herondo St./Anita St from PCH to Prospect Ave.	Residential	4	12	17,012	35	44	3.0%	5.0%	74.5	1.0104	74.6	74.6	1.0488	74.7	74.7				
Anita St from Prospect Ave to Flagler Lane	Residential	4	14	18,417	35	45	3.0%	5.0%	74.7	1.0104	74.7	74.7	1.0488	74.9	74.9				
190th St from Flagler Lane to Blossom Lane	Residential	4	12	20,051	35	46	3.0%	5.0%	74.7	1.0104	74.8	74.8	1.0488	74.9	74.9				
190th St from Blossom Lane to Meyer Ln	Residential	4	12	31,561	35	50	3.0%	5.0%	76.0	1.0104	76.0	76.0	1.0488	76.2	76.2				
190th St from Meyer Ln to Anza Ave	Residential	4	12	33,598	35	42	3.0%	5.0%	77.4	1.0104	77.4	77.4	1.0488	77.6	77.6				
190th St from Anza Ave to Inglewood Ave	Residential	4	12	38,946	35	50	3.0%	5.0%	77.4	1.0104	77.4	77.4	1.0488	77.6	77.6				
190th St from Inglewood Ave to Firmona Ave	Residential	4	12	29,756	35	45	3.0%	5.0%	76.9	1.0104	77.0	77.0	1.0488	77.1	77.1				
190th St from Firmona Ave to Hawthorne Blvd	Residential	4	14	30,551	35	45	3.0%	5.0%	77.0	1.0104	76.1	76.1	1.0488	77.2	77.2				
190th St from Hawthorne Blvd to Prarie Ave	Residential	4	12	30,460	35	50	3.0%	5.0%	76.1	1.0104	77.2	77.2	1.0488	76.3	76.3				
190th St from Prarie Ave to Crenshaw Blvd	Residential	4	14	41,171	35	55	3.0%	5.0%	77.1	1.0104	73.4	73.4	1.0488	77.3	77.3				
PCH from Artesia Blvd to Pier Ave	Residential	6	18	45,500	35	50	3.0%	5.0%	79.0	1.0104	79.0	79.1	1.0488	79.2	79.2				
PCH from Pier Ave to Aviation Blvd	Theater	6	18	51,000	35	50	3.0%	5.0%	79.5	1.0104	79.5	79.5	1.0488	79.7	79.7				
PCH from Aviation Blvd to Herondo St	Commercial	6	18	62,000	35	40	3.0%	5.0%	82.9	1.0104	83.0	83.0	1.0488	83.1	83.1				
Pier Ave from PCH to Valley Dr.	Theater	4	12	16,055	25	45	1.8%	0.7%	68.4	1.0104	68.4	68.5	1.0488	68.6	68.6				
Valley Dr from Pier Ave to 6th St.	Residential	2	0	4,709	25	15	1.8%	0.7%	64.6	1.0104	64.7	64.9	1.0488	64.8	64.9				
Valley Dr from 6th St to Herondo St.	Residential	2	0	4,021	25	16	1.8%	0.7%	64.4	1.0104	64.4	64.8	1.0488	64.6	64.6				