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Van Ness Avenue Well Field Project

Torrance, California

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Table of Contents

Section			Page
1.	**INTRODUCTION**		**1**
	1.1.	NOISE TERMINOLOGY AND DESCRIPTORS	1
	1.2.	CHARACTERISTICS OF SOUND	2
	1.3.	PSYCHOLOGICAL AND PHYSIOLOGICAL EFFECTS OF NOISE	3
	1.4.	VIBRATION TERMINOLOGY AND DESCRIPTORS	4
	1.5.	PROJECT DESCRIPTION	5
2.	**REGULATORY SETTING**		**7**
	2.1	STATE LAWS	7
	2.2	CITY OF TORRANCE REGULATIONS	7
3.	**ENVIRONMENTAL SETTING**		**11**
	3.1	EXISTING NOISE ENVIRONMENT	11
	3.2	SENSITIVE RECEPTORS	11
4.	**THRESHOLDS OF SIGNIFICANCE**		**13**
	4.1	CEQA APPENDIX G THRESHOLDS	13
	4.2	METHODOLOGY	13
5.	**ENVIRONMENTAL IMPACTS**		**17**
6.	**REFERENCES**		**31**

APPENDICES

Appendix. Noise and Vibration Details

Table of Contents

List of Tables

Table		Page
Table 1	Change in Apparent Loudness	2
Table 2	Typical Noise Levels	4
Table 3	Noise Level Limits for Residential Receivers	8
Table 4	Noise Limits at Industrial and Commercial Boundaries	9
Table 5	Corrections to Noise Limits	9
Table 6	Typical Vibration Levels Produced by Common Construction Equipment	18
Table 7	Pipeline Construction Noise Levels, Energy-Average (L_{eq}) Sound Levels	21
Table 8	Generalized Well Construction Noise Levels, Energy-Average (L_{eq}) Sound Levels	22
Table 9	Effective Noise Limits for Overnight Drilling Activities at Residential Receptors	23

1. Introduction

1) Is this the uniform project name?
2) Does this cover all wells & pipes?
↓ name

This Noise Technical Memorandum evaluates the potential noise and vibration impacts resulting from the construction and operation of the Descanso and Van Ness Water Wells Transmission Main design project in the City of Torrance.

1.1. NOISE TERMINOLOGY AND DESCRIPTORS

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

The following are brief definitions of terminology used in this chapter:

Sound. A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

Noise. Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

Decibel (dB). A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 µPa).

Vibration Decibel (VdB). A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the United States, the standard reference velocity is 1 microinch per second ($1x10^{-6}$ in/sec).

A-Weighted Decibel (dBA). An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level. The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

Statistical Sound Level (L_n). The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is

often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

Day-Night Sound Level (L_{dn} or DNL). The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

Community Noise Equivalent Level (CNEL). The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the sound levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

Note: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive—that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are considered to be interchangeable and are treated as equivalent in this assessment.

Sensitive Receptor. Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

1.2. CHARACTERISTICS OF SOUND

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate the human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA (the threshold of detection) to 140 dBA (the threshold of pain).

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels.

Table 1 Change in Apparent Loudness

± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen, 2009.

Perceptible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be the perceptibility threshold for exterior noise environments. Barely perceptible noise increases refer to a change of between 1 and 3 dBA. This range of noise levels was found to be noticeable to sensitive people in laboratory environments. Noise increases of less than 1 dBA are typically inaudible to the human ear except under very quiet conditions in controlled environments.

Sound is generated from a source and the decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss or distance attenuation.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and nighttime hours, state law requires that, for planning purposes and to account for this increased receptiveness of noise, an artificial decibel increment is to be added to quiet-time noise levels to calculate the 24-hour CNEL noise metric. These adjustment increments are +5 dB for sound levels between 7:00 PM to 10:00 PM and +10 dB between 10:00 PM and the following 7:00 AM.

1.3. PSYCHOLOGICAL AND PHYSIOLOGICAL EFFECTS OF NOISE

Exposure to high noise levels can affect the entire physiological system, with prolonged noise exposure in excess of 75 dBA increasing tension responses, thereby affecting blood pressure, heart performance, and nervous system functionality. Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, though generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in annoyance and interference (e.g., speech interruption/masking, sleep disturbance, hindrance of concentration).

Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level (SPL) number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from common sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
Very Remote & Unpopulated Area Nighttime		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: Caltrans 2009.

1.4. VIBRATION TERMINOLOGY AND DESCRIPTORS

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves from its original static position. The instantaneous speed that a point on a surface moves is the velocity, and the rate of change of the speed is the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure. These types of vibration are best measured and described in terms of velocity and acceleration.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the square root of the average of the squared amplitude of the signal. PPV and RMS are related to each other by

the signal's crest factor. PPV is more appropriate for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often vibration is presented and discussed in dB units in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one microinch per second (abbreviated as VdB). Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Man-made vibration problems are, therefore, usually confined to short distances (500 to 600 feet or less) from the source (FTA 2006).

Construction operations generally include a wide range of activities that can generate groundborne vibration. In general, blasting and demolition of structures generate the highest vibrations. Pile drivers, vibratory compactors or rollers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which can vary, depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, and differential settlement of pavement all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration from normal traffic flows on streets and freeways with smooth pavement conditions (Caltrans 2009). Trains generate substantial quantities of vibration due to their wheel-rail interactions, steel wheels, heavy loads, and engine operations (FTA 2006).

Ensure all doc.'s are consistent. CEQA SAYS 4 MILES.

1.5. PROJECT DESCRIPTION

The proposed project would result in the installation of three water wells and approximately 5.5 miles of water transmission lines. The new well sites would be on City-owned property—Site 1 (Well No. 12) is on 185th Street west of Purche Avenue; Site 2 (Well No. 13) is at the extreme west end of La Carretera Park, at 2040 186th Street; and Site 3 (Well No. 14) is in Descanso Park. A new water well would be required to be drilled at each of the three sites. Drilling operations would be continuous, 24-hour operations and the well construction/drilling would occur at one site at a time. Upon completion of the drilling operations at each site, an electric pump would be installed and would be enclosed in a structure.

Briefly describe "work items"

The project also includes construction of new storm drain piping—a new 16- to 24-inch plastic discharge (storm drain) pipeline from Site 1 to Site 3 and from Site 3 to an existing City storm drain in Border Avenue north of Plaza Del Amo. Additionally, a 12-inch pipe would connect Site 2 to the 24-inch pipe in Van Ness Avenue. The City of Torrance also requested additional work items at well Site 2, at the east edge of La Carretera Park, which could generate construction-related air quality emissions (analyzed in a separate document). The new water transmission lines would bring fresh well water to the City's existing reservoir and booster pump station at 2223 Border Avenue. The water transmission line improvements would be within the existing right-of-way.

Residential land uses are adjacent to the City properties (Sites 1, 2, and 3) and along the transmission route. Other sensitive receptors proximate to the City properties and along the transmission route include parks and schools (e.g., La Carretera Park, Descanso Park, Torrance Adult School).

provide basis (date) of said document & conclusion and attach as ref./appendix to this report.

1. Introduction

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2. Regulatory Setting

To limit people's exposure to physically and/or psychologically damaging as well as intrusive noise levels, federal, state, and local agencies have established standards and ordinances to control noise. Potential noise and vibration impacts were evaluated based on the City of Torrance Municipal Code and General Plan to determine whether significant adverse noise impacts would result from construction and operation of the proposed project. The pertinent City documents are included in the appendix.

2.1 STATE LAWS

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new or renovation construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations are intended to mitigate potential noise impacts at noise-sensitive structures—such as residences, schools, or hospitals—that are near major transportation noise sources and where such traffic-related noise sources create an exterior noise level of 60 dBA CNEL or higher. Since the proposed uses are *not* noise-sensitive applications, the Title 24 regulations would not apply to this project.

2.2 CITY OF TORRANCE REGULATIONS

2.2.1 Noise Element

The City of Torrance Noise Element, a component of the City's general plan, sets goals and policies to minimize adverse noise impacts and preserve a high quality of life for residents. It also serves as a tool for local planners to use in achieving and maintaining compatible land use with environmental noise levels. The noise element contains criteria designed to integrate noise considerations into land use planning to prevent noise/land use conflicts. However, it is important to note that with the recent California Supreme Court decision regarding the assessment of the environment's impacts on proposed projects (CBIA v BAAQMD, issued December 17, 2015), it is generally no longer the purview of the CEQA process to evaluate the impact of existing environmental conditions on any given project. Therefore, exterior noise effects from nearby noise sources relative to land use compatibility of the project is no longer a topic for impact evaluation under CEQA, and no statement of impact significance is germane. For reference, applicable portions of the City of Torrance General Plan Noise Element will be included in the appendix. The goals of the noise element are implemented and enforced through the municipal code.

2. Regulatory Setting

2.2.2 Municipal Code

2.2.2.1 OPERATIONAL/LONG-TERM NOISE

Torrance's noise ordinance is designed to protect people from non-transportation noise sources such as music, construction activity, machinery and pumps, and air conditioners. Enforcement of the ordinance ensures that adjacent properties are not exposed to excessive noise from stationary sources. It is unlawful to produce noise that exceeds the limits in the municipal code (specifically, section 46.7.2).

The municipal code sets noise limits by (a) receiver type and (b) regions in the city. Torrance's Noise Element includes descriptions for the noise regions presented in the municipal code, as follows:

- **Region 1** includes the predominantly industrial areas in and around the refineries and industrial uses on the western edge of the City.
- **Region 2** includes the area in and around the airport and includes the commercial and industrial uses south of Lomita Boulevard and north of Pacific Coast Highway.
- **Region 3** encompasses the residential neighborhoods south of Pacific Coast Highway and west of Hawthorne Boulevard.
- **Region 4** includes the remainder of the City.

For receivers on residential properties 500 feet or more from the boundaries of Regions 1 and 2, the noise limits are shown in Table 3. For receivers within 500 feet of the boundary of Regions 1 or 2, the limits are 5 dB above the levels in Table 3 or 5 dB above the ambient noise level, whichever is lowest. The regions and the related 500-foot boundary zones are mapped on Exhibit A in Section 46.7.2 of the municipal code, which is provided in the appendix to this study. The project site and surrounding areas are all within Regions 1 and 4. Noise sources on industrial and commercial land are prohibited from producing noise levels at their property boundaries above the thresholds in Table 4. Table 5 shows the adjustments to the limits in Tables 3 and 4 under certain conditions.

Table 3 Noise Level Limits for Residential Receivers

Receiver Region	Noise Level (dB)[1]	
	Day (7 AM to 10 PM)	Night (10 PM to 7 AM)
3	50	45
4	55	50

[1] Although Sections 46.1 through 46.6 of the municipal code intermix "dB" and "dBA," it is assumed that the City intended to specify noise level limits in terms of A-weighted decibels (i.e., "dBA").

Table 4 Noise Limits at Industrial and Commercial Boundaries

Source Region	Noise Level (dB)[1]	
	Day (7 AM to 10 PM)	Night (10 PM to 7 AM)
1	70	65
2	60	55
All Remaining Industrial Land Uses	60	55
All Commercial Land Use	60	55

[1] Although Sections 46.1 through 46.8 of the municipal code intermix "dB" and "dBA," it is assumed that the City intended to specify noise level limits in terms of A-weighted decibels (i.e., "dBA").

Table 5 Corrections to Noise Limits

	Noise Conditions	Correction to Limits (dB)
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 (12:01 AM to 12:01 PM)	–5

2.2.2.2 CONSTRUCTION NOISE

According to the municipal code, Section 46.3.1, construction is allowed from 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction is prohibited on Sundays and holidays (that are observed by City Hall), except between the hours of 10:00 AM to 4:00 PM for homeowners who reside at the property. Construction is allowed outside these hours as long as noise levels do not exceed 50 dB,[1] as measured at property lines in or adjacent to a residential area, or a written request has been approved by the community development director. Except for emergencies, heavy construction equipment—pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors—is prohibited from operating in or adjacent to a residential area without permission from the community development director.

2.2.2.3 VIBRATION STANDARDS

The City of Torrance Municipal Code does not include vibration standards. Instead, this analysis will use the standards in the Federal Transit Administration's (FTA) guideline manual, Transit Noise and Vibration Impact Assessment (May 2006). Based on the FTA guidelines, an impact would occur if construction activities generate vibration that is strong enough to physically damage buildings. The threshold for vibration-induced architectural damage is 0.2 peak particle velocity (PPV) in inches per second (in/sec) for typical wood-framed buildings. The threshold for human annoyance at residential receptors during the daytime is 78 VdB and 84 VdB at offices.

[1] Understood to be A-weighted decibels (dBA) per the definitions of Code Section 46.1.2.

2. Regulatory Setting

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3. Environmental Setting

3.1 EXISTING NOISE ENVIRONMENT

The proposed project includes the construction and operation of three wells and approximately 5.5 miles of water pipelines throughout the City of Torrance. The proposed wells and pipelines are in the eastern part of the city, near various land use types. The proposed pipeline runs through Noise Regions 1 and 4, as defined by municipal code section 46.7.2, Exhibit A.

The locations of the wells in the project description are in Noise Region 4 in a residential area near Van Ness Avenue, just north of the 405 freeway. The noise environment around this residential area will be primarily controlled by roadway noise from I-405, and to a lesser extent, Van Ness Avenue. Residential operations (property maintenance, people talking, etc.) may also, at times, be audible around the project area, but it is not expected to notably contribute to the overall noise environment around these residential areas. According to the Baseline Noise Condition Contours in the Torrance General Plan Noise Element, Wells Nos. 12 and 13 are within the 65 dBA CNEL contour, and well No. 14 is within the 60 dBA CNEL contour. The Torrance Noise Element is included in the attached appendix, for reference.

The majority of the proposed water pipeline is within Noise Region 1 and will run along the right-of-way of Van Ness Avenue. South of Torrance Boulevard, the proposed pipeline will run along the right-of-way of Border Avenue and end just north of Plaza Del Amo. The primary existing noise source along the proposed pipeline pathway is traffic flow noise along the associated roadway right-of-way.

3.2 SENSITIVE RECEPTORS

Residences are within 500 feet of the pipeline for about half of its length. Residential land uses will be the most sensitive receptors in terms of construction and operation of the proposed project. For the remainder of the length, the pipeline is surrounded by commercial and industrial receptors, which are less sensitive to noise.

Receptors in proximity to the proposed wells and pipeline are expected to be exposed to temporary levels of construction noise. As a linear project, the construction of the pipeline portion of the project would create temporary construction noise levels that would move along the pipeline's pathway. That is, for any given receptor along the pathway, noise levels would increase as the pipeline installation activities came nearer that location, and then diminish as the installation activities moved away from that location; returning to the pre-project ambient conditions.

Conversely, the three proposed well locations would have relatively stationary construction activities throughout the duration of the drilling process. These three well sites are surrounded by single-family residences, recreational park space, and, for Well No. 12, the Hamilton School. Receptors near the proposed wells would be exposed to construction noise and may also be exposed to operational noise; both of which will be discussed in detail in the Environmental Impacts Section, below.

3. Environmental Setting

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4. Thresholds of Significance

4.1 CEQA APPENDIX G THRESHOLDS

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would result in:

N-1 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.

N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

4.2 METHODOLOGY

Noise impacts on the surrounding community are assessed through local noise ordinances, supported by policies from the General Plan Noise Element, as well as from industry standards (primarily on the issue of vibration impacts). In general, noise-related impacts would occur if the project created a significant increase in noise above the ambient noise level as a result of a new noise source (either through on-site emissions or through noise generated by project traffic). This increase will be judged in terms of the potential to adversely affect noise-sensitive land uses.

Noise level limits on the surrounding community are enforced through local noise ordinances, supported by nuisance complaints and subsequent investigation. The second measure of impact used in this analysis is whether the increase in noise above the ambient noise level as a result of a new noise source (either through on-site emissions or through noise generated by project traffic) has the potential to adversely affect noise-sensitive land uses.

4. Thresholds of Significance

4.2.1 Traffic Noise Thresholds

Neither CEQA nor the City defines the magnitude of the increase in the ambient noise level at noise-sensitive receptors that would be considered a substantial increase. The Torrance Noise Element simply states that:

> The City's goals and policies regarding noise aim to minimize adverse noise impacts and to preserve the high quality of life for City residents. Torrance will maintain a peaceful environment by identifying noise impacts and mitigating noise problems through acoustical treatments and appropriate land use policies. (Torrance 2010, p. N-16)

In general, people tend to compare intruding noise with the existing background noise. If the new noise is readily identifiable or considerably louder than the background, it has the potential to be objectionable or annoying (Caltrans 2009). In lieu of specific thresholds from the noise element, the traffic noise impact thresholds used herein are based on human tolerance to noise (see Table 1) and are widely used for assessing traffic noise impacts. That is, human sound perception is generally such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving of sound level. Only audible changes of 3 dBA or greater at sensitive receptors are considered potentially significant when noise levels exceed the compatibility criteria. Based on the City of Torrance guidelines for what would be considered "normally compatible" for office, commercial, and medical uses, project-related traffic noise impacts would be substantial when the ambient noise environment along the roadway segments in the project's study area under with-project conditions increases by 3 dB *and* exceeds 70 dBA CNEL.

4.2.2 Stationary Noise Thresholds

The stationary noise thresholds are based on a combination of the human awareness of noise and local criteria for stationary noise sources as established by the City of Torrance for noise control. Pursuant to municipal code section 46.7.2, the City restricts stationary noise levels generated by air conditioning, refrigeration, heating, pumping, and filtering equipment as follows:

For receivers on residential land within Region 4 (which pertains to this project site and vicinity), the noise limits are 55 dBA during the daytime (7 AM to 10 PM) and 50 dBA during the nighttime (10 PM to 7 AM). For receivers on industrial or commercial land, the noise limits are 60 dBA during the daytime (7 AM to 10 PM) and 55 dBA during the nighttime (10PM to 7 AM). In all cases, the limits are the lowest of these values *or* 5 dB above the ambient noise level. Additionally, the corrections summarized in Table 5 above would be applied, if appropriate (such as for steady, audible tones, or repetitive impulses noise sources).

A significant impact would occur if the project would cause an exceedance of the municipal code thresholds (see Tables 3, 4, and 5, above).

4.2.3 Construction Noise Thresholds

According to the municipal code, Section 46.3.1, construction is allowed from 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturdays. Construction is prohibited on Sundays and holidays

(that are observed by City Hall).[2] For all of the above, construction is allowed outside these hours as long as noise levels do not exceed 50 dB,[3] as measured at property lines in or adjacent to a residential area, or as long as a written request has been approved by the community development director. Except for emergencies, heavy construction equipment—pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors—is prohibited from operating in or adjacent to a residential area without permission from the community development director.

[2] With an exception for homeowners who reside at the property, who can conduct such activities between the hours of 10:00 AM to 4:00 PM.

[3] Understood to be A-weighted decibels (dBA) per the definitions of Code Section 46.1.2.

4. Thresholds of Significance

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5. Environmental Impacts

This section discusses the project-specific impacts related to noise and vibration.

a. 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?

Less Than Significant Impact.

Construction Phases? Ok to ~~Ref~~ Refer to (d) ~~Ref~~ But determination of "Less than Significant Impact" will be different. #11

Stationary Equipment Noise Sources

Wells

On-site stationary noise sources would include mechanical equipment at Wells Nos. 12, 13, and 15 (Site 1, 2, and 3, respectively). All noise sources at these well facilities would be enclosed in masonry structures, which would be treated with internal acoustical panels, and any ventilation would face away from local residences and Hamilton School. Thus, noise exposure due to the operation of the proposed well facilities is expected to be minimal. Since the residential areas just north of I-405 currently experience high ambient noise levels, noise due to operation of the well facilities would not approach or exceed the ambient noise environment around the project sites. Operational noise due to the well facilities is not expected to be audible, even at the receptors closest to the project sites. Therefore, no significant impacts would occur and no mitigation measures are necessary.

Storm Drain/Water Transmission Line

The pipeline system would be subterranean, and once installed, operational noise would not be audible at any receptor. Implementation of stationary equipment due to the potential development would not result in an increase above existing ambient noise levels. Therefore, no significant impacts would occur and no mitigation measures are necessary.

Roadway Noise Sources

Implementation of the proposed project would not alter the current traffic patterns around the proposed project sites. Operation of the wells would require up to one worker trip per day for maintenance, which would be completely negligible in comparison to the existing traffic flows along residential arterials. Thus, there is not expected to be any increases in roadway noise due to project operations.

No significant permanent noise increases due to project-related activities, equipment, or traffic would occur, and no mitigation measures are necessary. Temporary, construction impacts are discussed below in item d.

5. Environmental Impacts

b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact.

Operational Vibration

While the proposed project would include pumping equipment at the well sites, the operation of the proposed project would not include any notable, long-term vibration sources. Thus, no significant vibration effects or impacts from operations sources would occur, and no mitigation measures are required.

verify length to ensure consistency in all documents

Construction Vibration

The proposed project would include the construction of three well facilities and approximately 5.5 miles of water transmission lines. Regardless of the location (well site or linear pipeline), construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance.

Construction activities can generate ground vibration that varies depending on the construction procedures, equipment used, and proximity to vibration-sensitive uses. Such vibrations may have two types of potential impacts: (a) architectural damage to nearby buildings and (b) annoyance to vibration-sensitive receptors. Groundborne vibration is usually highest during the demolition and grading phases of construction, which use the heaviest equipment. The proposed project would not include building demolition and would require minimal grading associated with asphalt trenching for the pipeline.

It is important to note that groundborne vibration is typically not perceptible outdoors and, therefore, impacts are normally based on the distance to the nearest building (FTA 2006). All receptor buildings surrounding the project site are more than 50 feet from the nearest project boundary. Table 6 lists vibration levels for different types of common construction equipment at a reference distance of 50 feet. Vibration levels are presented in VdB (for vibration annoyance), and PPV (for architectural damage due to vibration).

Table 6 Typical Vibration Levels Produced by Common Construction Equipment

Equipment	Approximate RMS[1] Velocity Level at 50 feet (VdB)	Approximate PPV Velocity at 50 feet (in/sec)
Pile Driver, Impact (typical)	95	0.235
Pile Driver, Sonic (typical)	84	0.060
Vibratory Roller	85	0.074
Large Bulldozer	78	0.031
Caisson Drilling	78	0.031
Loaded Trucks	77	0.027
Jackhammer	70	0.012
Small Bulldozer	49	0.001

Source: FTA 2006.
1 RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second and a crest factor of 4.

no change

Large, vibration-intensive construction equipment can potentially exceed levels where they become strongly perceptible (i.e., 78 VdB) or where they could exceed the threshold for architectural damage (i.e., 0.2 PPV

in/sec). However, the proposed well construction would not use construction equipment similar to pile drivers or vibratory rollers. Rather than a vibratory roller, the project would use a sheepsfoot compactor[4] and a steam roller,[5] both of which generate much less intense vibration. Other equipment items expected to be employed during construction activities would be similar to large or small bulldozers.[6]

Given that neither pile driving nor vibratory rollers are expected to be needed for this project, the equipment item with the highest vibration level that would be expected to be used would be from a large bulldozer or a drilling rig[7] (see Table 6, above), each of which generates approximately 78 VdB, or 0.031 PPV at 50 feet.

Since vibration dissipates quickly with distance and since the nearest residences are over 50 feet from the project boundary, vibration levels would be expected to remain below the pertinent FTA thresholds (78 VdB for annoyance, 0.2 PPV for architectural damage), even for large bulldozers or caisson drills. Therefore, construction-related vibration impacts for both annoyance- and damage-related effects would be less than significant and no mitigation measures are necessary.

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Less than Significant Impact.

As presented in item a, above, project-generated operational noise from the proposed wells, pipeline system, or project-related traffic would not result in a substantial permanent increase in ambient noise levels. Therefore, these ongoing activities would generate less-than-significant noise impacts. Thus, no mitigation measures are needed.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Less Than Significant Impact (Pipeline).

Less Than Significant Impact with Mitigation Measures Incorporated (Well Drilling).

Temporary increases in ambient noise levels may result from construction activities. Sensitivity to noise is based on the location of the equipment relative to sensitive receptors, the time of day, and the duration of the noise-generating activities. Noise produced from construction is commonly held to decrease at a rate of at least 6 decibels (dB) per doubling of distance, conservatively ignoring other attenuation effects from air absorption, ground effects, and shielding from existing structures. For example, a dozer that generates 85 dBA at 50 feet would measure 79 dBA at 100 feet, 73 dBA at 200 feet, and 67 dBA at 400 feet (at minus 6 dB per doubling of distance).

[4] An example of such a machine is the Caterpillar CP-433C.
[5] According to the associated Air Quality and Greenhouse Gas Emissions Technical Memorandum.
[6] A "large" bulldozer is above an operating weight of 85,000 pounds (e.g., Caterpillar D8-class or larger); a "medium" bulldozer has an operating weight range of 25,000 to 60,000 pounds (e.g., Caterpillar D6- or D7-class); and a "small" bulldozer has an operating weight range of 15,000 to 20,000 pounds (e.g., Caterpillar D3-, D4-, or D5-class).
[7] Denoted as 'Caisson Drilling' in the reference table.

5. Environmental Impacts

Construction activities are exempt from the noise regulations of the Torrance Municipal Code as long as they occur between the hours of 7:30 AM and 6:00 PM on weekdays, or between the hours of 9:00 AM and 5:00 PM on Saturdays. If construction activities were conducted outside of these hours (including any time on Sundays or holidays observed by City Hall), such activities would be subject to the basic municipal code noise limits (Section 46.7.2), presented herein in Tables 3, 4, and 5.

Using information provided by Quantum Consulting, Inc., coupled with methodologies and inputs employed in the air quality assessment, the expected construction equipment mixes were estimated and categorized by construction activity. The associated, aggregate sound levels—grouped by construction activity—were estimated at a reference distance from the accumulated source, and the basic sound propagation attenuation factor (6 dB per distance doubling) was applied to calculate construction noise levels at the nearby receptors. The two major scenarios of construction activities—the linear pipeline and the stationary well drilling—are discussed separately as follows.

Construction Noise, Pipeline

The proposed project includes the installation of approximately 5.5 miles of water transmission lines. The majority of the proposed pipeline would be in Noise Region 1 and run along the right-of-way of Van Ness Avenue. For project areas south of Torrance Boulevard, the proposed pipeline would run along the right-of-way of Border Avenue and would end just north of Plaza Del Amo. Residences are within 500 feet of the pipeline for about half of its length of the entire pipeline (primarily north of 190th Street). For the remainder of its length, the pipeline is surrounded by commercial and industrial receptors, which are less sensitive to noise than are residential land uses.

Additional daily traffic due to the transport of workers and equipment to the construction site could increase roadway noise around the project site. However, the proposed pipeline location runs along Van Ness Avenue, which is a heavily trafficked roadway. Additional vehicles due to construction operations would not demonstrably increase traffic along Van Ness Avenue, and this small increment of additional vehicles would not result in notable roadway noise increases. The proposed pipeline would also run along Border Avenue, which is a less trafficked street. However, the industrial and commercial receptors surrounding this stretch of pipeline are not noise-sensitive land uses, and construction vehicle noise is not expected to result in a significant impact.

Total construction of the pipeline is expected to take approximately 7 months.[8] Assuming that the pipeline would be constructed step-by-step, sensitive residential receptors would be affected by construction noise for approximately 3.5 months (while construction is in residential areas). Furthermore, individual residential receptors would be affected for a fraction of that time, because equipment would not be in use at any one location for an extended period of time. Based on the anticipated construction schedule, 183 days, and the project size, approximately 20,000 lineal feet, it is anticipated that, on average, construction activities would cover approximately 109 lineal feet per day. Thus, any given receptor location would be expected to experience audible pipeline construction noise for no more than a week or two.

this correlate to 5.5 miles? If not, update this figure as well.

20,000 linear feet is 3.79 miles → update reference to 5.5 mi to 4

[8] According to the associated Air Quality and Greenhouse Gas Emissions Technical Memorandum.

To represent the anticipated construction-related noise levels along the entire pipeline, aggregated construction noise was projected out to 50 feet, 100 feet, 150 feet, and 200 feet from any given pipeline activity location. Construction noise levels would be reduced at a conservative rate of approximately 6 dB per doubling distance (while neglecting other sound attenuation factors such as air absorption, ground effects, and shielding from existing structures). These calculations apply to any of the receptors near the project site (at the pertinent distance from the source). Construction noise level estimates for the pipeline are summarized in Table 7.

Table 7 Pipeline Construction Noise Levels, Energy-Average (L_{eq}) Sound Levels

	Pipeline Construction Noise Levels at Defined Distances (dBA L_{eq})			
Construction Phase	At 50 feet	At 100 feet	At 150 feet	At 200 feet
Demolition	79	73	70	67
Site Preparation/Grading	85	79	75	73
Utility Trenching	83	77	74	71
Pipeline Construction	84	78	75	72

Notes: Calculations performed with the FHWA's RCNM software and are included in the appendix.

As shown in the table, combined noise levels for each construction phase would range from 79 to 85 dBA L_{eq} (due to distance attenuation alone). Construction activities would result in lower noise levels at more distant receptors due to attenuation from increasing distances from the source, as well as from shielding provided by intervening structures (such as rows of houses).

Construction activities would be limited to relatively small- to medium-sized equipment (i.e., bulldozers, grading tractors, dump trucks, rollers, back hoes, pavers, and a concrete saw), would be temporary and of very limited duration (i.e., generally less than two weeks), would occur during the least sensitive portions of the day (when many residents would be away from their homes), and would conform to the time-of-day restrictions of the City's municipal code. Therefore, pipeline construction noise impacts would be less than significant and no mitigation measures are necessary.

Construction Noise, Well Facilities

The proposed project includes the construction of three well facilities in residential areas. The typical residential urban noise environment close to major roads such as I-405 would be in the range of 50 to 60 dBA. The major work effort for these facilities would be the drilling of new, permanent wells.[9] These drilling activities would occur one site at a time, would have an expected total duration of approximately four weeks, and would have to be conducted continuously (due to the nature of the drilling process). The expected four-week total duration would consist of one week of mobilization and set-up, two weeks of drilling, and one week for tear-down and demobilization. It is our understanding that the drilling effort will be conducted by an entity other than the Applicant, but these drilling activities are covered in this environmental assessment as

[9] Sites 1 and 2 have been predrilled, but would have to undergo the same drilling process as at Site 3 for the permanent well shaft.

5. Environmental Impacts

part of the overall project. Following completion of the drilling at each wellhead, the enclosures around the wells and pumps would be constructed.

All three well sites would include similar construction processes, and all are in close proximity to single-family homes. To represent the generalized construction-related noise levels at all three locations, the construction noise for the well facilities was projected outward at several selected distances from the proposed construction site. Only the construction equipment mix associated with the well facilities is included in this analysis.[10] These calculations generally apply to the noise-sensitive receptors near the project's three well sites, and the aggregate, generalized construction noise level estimates for the well facilities are summarized in Table 8.

Table 8 Generalized Well Construction Noise Levels, Energy-Average (L_{eq}) Sound Levels

	Well Construction Noise Levels at Selected Distances (dBA L_{eq})									
Construction Phase	At 50 feet	At 100 feet	At 150 feet	At 200 feet	At 250 feet	At 400 feet	At 445 feet	At 790 feet	At 1,415 feet	At 2,500 feet
Well Construction	79	73	70	67	65	61	60	55	50	45

Notes: Noted attenuation with distance ONLY includes spherical spreading loss for basic energy propagation, without consideration of ground effects, atmospheric absorption, reflections, scattering, or shielding reductions from barriers/structures.
Calculations performed with the FHWA's RCNM software and included in the appendix.
Some selected distances are to show 6 dB per distance-doubling relationship and some selected distances are to show 5 dB increments relative to the Municipal Code standards.

As shown in the table, combined noise levels for each construction phase would range from 79 to 65 dBA L_{eq} (due to distance attenuation alone relative to a range of 50 feet to 250 feet). Noise levels from construction activities would be lower at more distant receptors due to attenuation from increasing distances from the sources. With only distance attenuation considered, well construction noise would be reduced to 50 dBA at approximately 1,425 feet and to 45 dBA at approximately 2,500 feet. In practical, real-world application, however, the 45 dBA level would be experienced at distances considerably less than 2,500 feet due to the inclusion of ground effects, atmospheric absorption, reflections, scattering, or shielding reductions from barriers/structures (that were not considered in the calculation results of Table 8).

For daytime hours, construction activities would be limited to relatively small- to medium-sized equipment (i.e., dump trucks, back hoes, and a drill rig), would be temporary and of limited duration, would occur during the least sensitive portions of the day (when many residents would be away from their homes), and would conform to the time-of-day restrictions of the City's municipal code. Therefore, well construction noise impacts during the *daytime* hours would be less than significant.

However, the drilling process needs to be continuous until the desired depth is achieved. Thus, once started, the two (possibly three) weeks of drilling will be 24 hours and will not conform to the time-of-day restrictions of the City's municipal code (i.e., between 6:00 PM and the following 7:30 AM on weekdays [Monday through Thursday], between 6:00 PM on Friday night to the following 9:00 AM on Saturday morning, or between 5:00 PM on Saturdays through to the following 7:30 AM on Monday morning). During these nonconforming

[10] Per the Air Quality evaluations, the following equipment were assumed for the generalized well drilling and wellhead construction phases: one backhoe, one dump truck, one drill rig truck, one pick-up truck (equivalent to a forklift), one crane, and one pump.

evening and nighttime hours, such activities would be subject to the basic municipal code noise limits (Section 46.7.2), shown in Tables 3, 4, and 5, specifically, for residential receptors in Noise Zone 4 (which is applicable for all receptors near all three well sites). Table 3 shows that the morning limit (i.e., from 7:00 AM to 7:30 AM) and the evening limit (i.e., from 6:00 PM to 10:00 PM) are 55 dBA, and the nighttime limit (i.e., from 10:00 PM to 7:00 AM) is 50 dBA. The corrections for these limits (shown in Table 5) would not apply for correction items 1, 2, or 3, since drilling would not be expected to generate steady whine/screech/hum sounds, would not generate impulsive noise, and would be continuous (relative to items 1, 2, and 3, respectively). However, a minus 5 dB correction to the nominal limits would be applied to drilling activities on Sunday mornings (between 12:01 AM to 12:01 PM). These off-hour restrictions are summarized in Table 9.

Table 9 Effective Noise Limits for Overnight Drilling Activities at Residential Receptors

Time Period				
Morning (7:00 AM to 7:30 AM)	Evening (6:00 PM to 10:00 PM)	Nighttime 10:00 PM to 7:00 AM)	Sunday Morning - early 12:01 AM to 7:00 AM)	Sunday Morning - late 7:01 AM to 12:01 PM)
55 dBA[1]	55 dBA	50 dBA	45 dBA[2]	50 dBA[3]

1 Although Sections 46.1 through 46.8 of the municipal code intermix "dB" and "dBA," it is assumed that the City intended to specify noise level limits in terms of A-weighted decibels (i.e., "dBA").
2 This is the nominal overnight limit of 50 dBA with a 5 dB penalty applied to arrive at 45 dBA.
3 This is the nominal daytime limit of 55 dBA with a 5 dB penalty applied to arrive at 50 dBA.

Given that drilling will take place over at least one Sunday, Table 9 shows that the most restrictive limit is 45 dBA at residential receptors (for the seven hours on Sunday morning between midnight and 7 AM). This would require a 34 dB reduction of noise emissions, relative to the 50-foot reference distance. For the other overnight periods (i.e., 10 PM to the following 7 AM), the limit is 50 dBA at residential receptors, which would require a 29 dB reduction of noise emissions (relative to the 50-foot reference distance).

For aggregate noise level emissions from evening and nighttime, it is likely that a smaller set of equipment would actually be used than for the generalized equipment set noted above, which is expected during daytime construction periods. For example, only the essential drilling equipment of the drill rig truck and the drilling fluid pump would likely be used during these off-hour activities. Therefore, overnight noise levels would tend to be somewhat less than during the full-complement daytime operations (as depicted in Table 8 above). Nonetheless, for conservatism, the full-set equipment noise levels shown in Table 8 are assumed for the overnight drilling operations. These drilling noise emissions and ordinance restriction conditions are discussed separately for each well site.

Well Drilling, Site 1 (Well No. 12)

This well site is just beyond the southeast corner of the Hamilton Education Center campus and adjacent to the termination of 185th Street (which ends at a gate to the campus). There are homes on either side of 185th Street that would be in close proximity to the drilling location, as well as homes along Purche Avenue (which back to the campus) that would also have direct line-of-sight to the drilling location. Residential structures along either side of 185th Street are within the range of 77 to 167 feet of the wellhead. The rear facades of residential structures along the west side of Purche Avenue (that still would have line-of-sight

5. Environmental Impacts

access) are within 81 to 344 feet of the wellhead. In all, residential receptors are in three directions from the well site, and the educational campus is in the fourth direction.

At these noted distances, well drilling activities would be expected—in the absence of noise mitigation measures—to result in sound levels between approximately 62 and 75 dBA at the residential structures (while *only* considering distance attenuation of the well drilling noise emissions). Thus, reductions of up to 30 dB would be required to meet the most restrictive limit of 45 dBA at residential receptors (for the seven hours on Sunday morning between midnight and 7 AM), and reductions of up to 25 dB would be required to meet the general overnight limit of 50 dBA at residential receptors (between 10 PM and the following 7 AM). Therefore, unmitigated noise from drilling activities would be a significant impact during the evening and overnight hours.

For informational purposes and assuming a windows-closed configuration—which would be expected to achieve approximately 25 dB of reduction for exterior-to-interior sound transmission loss (Caltrans 2013 and SAE 1971)—interior levels would be predicted to be in the range of 37 to 50 dBA.[11]

Given the triangular shape of the drilling site and the orientation of noise-sensitive receptors, drilling activity noise emissions would require substantial reduction along all portions of the well site.

Well Drilling, Site 2 (Well No. 13)

This well site is in the northwest corner of the triangular-shaped (existing) La Carretera Park. The development of Site 2 (Well No. 13) would require the renovation of the La Carretera Park. Modifications include: design of a new picnic area on the east side of the existing play equipment area, replacement and reconfiguration of play equipment and ground cover, improvements to the basketball courts, replacement of the existing fences, and installation of new light fixtures. The renovations of La Carreterra Park would not require construction equipment capable of generating excessive noise, and therefore will not result in significant daytime noise impacts around the community.

The site is adjacent to 186th Street (to the north), midblock between Wilton Place and Taylor Court. The site is also adjacent to Caltrans right-of-way and the nearby I-405 freeway. The ambient noise environment at this location would be primarily controlled by traffic flows along the freeway, regardless of time of day.

There are homes to the east of the well site, beyond the eastern boundary of La Carretera Park, and approximately 620 feet from the proposed wellhead. Also, there are homes to the north of the site, across 186th Street, the closest of which are approximately 100 feet to the wellhead. These northern and eastern receptor locations would have direct line-of-sight access to the well drilling area.

There are also residences to the southwest of the site, across the I-405 freeway, that are as close as 330 feet from the wellhead. It should be noted that this section of the I-405 freeway has sound wall on both sides of the outermost lanes of travel. Thus, noise from well-drilling activities would be attenuated notably by these roadway noise barriers with respect to the homes to the southwest of the site—possibly by as much as 25 to

[11] Note that the City of Torrance does not have specific interior noise level restrictions in either the Noise Element or the Municipal Code.

30 dB (in addition to distance propagation). In all, residential receptors are to the northwest, north, northeast, east, and southwest of the well site.

At these noted distances, well-drilling activities would be expected—in the absence of noise mitigation measures—to result in sound levels between approximately 57 and 73 dBA at the residential structures (while *only* considering distance attenuation of the well drilling noise emissions). Thus, reductions of up to 28 dB would be required to meet the most restrictive limit of 45 dBA at residential receptors (for the seven hours on Sunday morning between midnight and 7 AM) and reductions of up to 23 dB would be required to meet the general overnight limit of 50 dBA at residential receptors (between 10 PM and the following 7 AM). Therefore, unmitigated noise from drilling activities would be a significant impact during the evening and overnight hours.

For informational purposes and assuming a windows-closed configuration—which would be expected to achieve approximately 25 dB of reduction for exterior-to-interior sound transmission loss (Caltrans 2013 and SAE 1971)—interior levels would be predicted to be in the range of 32 to 48 dBA.[12]

Given the triangular shape of the drilling site and the orientation of noise-sensitive receptors, drilling activity noise emissions would require substantial reduction along the western, northern, and eastern portions of the well site. No mitigation measures are expected to be needed along the southern boundary since distance attenuation to homes to the south of the I-405 freeway would provide approximately 16 dB of noise reduction, roadway barrier walls would provide at least an additional 25 dB or reduction—for a combined reduction of 41 dB which would yield projected drilling noise levels of approximately 38 dBA—and the ambient environment (even late at night) is expected to be dominated by traffic flow sources and to be well above 38 dBA.

Well Drilling, Site 3 (Well No. 14)

This well site is in the southwest corner of the triangular-shaped (existing) Descanso Park. The development of Site 3 (Well No. 14) would not require any renovations at this park. The site is adjacent to Casimir Avenue (to the west). The site is also adjacent to an electrical transmission line right-of-way, which is being used as a plant nursery storage area (to the southwest, south, and southeast of the site). This nursery is not a noise-sensitive land use and would not be occupied during evening or nighttime hours.

There are homes to the east of the well site, beyond the eastern boundary of Descanso Park, and approximately 470 feet from the proposed wellhead. Also, there are homes to the north of the site, across Descanso Way, the closest of which are approximately 360 feet to the wellhead. These northern and eastern receptor locations would have direct line-of-sight access to the well drilling area. There are also residences to the west of the site, across Casimir Avenue, which are as close as 80 feet from the wellhead. Beyond the transmission line and nursery area, there are residences to the south of the site, the closest of which are approximately 350 feet from the wellhead. In all, residential receptors are in all directions from the well site.

[12] Note that the City of Torrance does not have specific interior noise level restrictions in either the Noise Element or the Municipal Code.

5. Environmental Impacts

At these noted distances, well drilling activities would be expected—in the absence of noise mitigation measures—to result in sound levels between approximately 60 and 75 dBA at the residential structures (while *only* considering distance attenuation of the well drilling noise emissions). Thus, reductions of up to 30 dB would be required to meet the most restrictive limit of 45 dBA at residential receptors (for the seven hours on Sunday morning between midnight and 7 AM) and reductions of up to 25 dB would be required to meet the general overnight limit of 50 dBA at residential receptors (between 10 PM and the following 7 AM). As such, unmitigated noise from drilling activities would be a significant impact during the evening and overnight hours.

For informational purposes and assuming a window-closed configuration—which would be expected to achieve approximately 25 dB of reduction for exterior-to-interior sound transmission loss (Caltrans 2013 and SAE 1971),—interior levels would be predicted to be in the range of 35 to 50 dBA.[13]

Given the location of the drilling site, coupled with the orientation of noise-sensitive receptors, drilling activity noise emissions would require substantial reduction along the four sides of the well site.

Mitigation Measures (Well Drilling)

MM NOI-1 Prior to issuance of permits to perform construction, a construction noise mitigation plan shall be prepared, reviewed, and approved by the City of Torrance Community Development Director. The plan shall be implemented during project construction per the following methods:

a. At least 90 days prior to the start of construction activities, residents within 1,000 feet of the project site shall be notified of the planned construction activities. The notification shall include a brief description of the project, the activities that would occur, the duration and hours when construction would occur. The notification should include the telephone number of the City's authorized representative to respond in the event of a vibration or noise complaint.

b. At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance to the job site, clearly visible to the public, which contains a contact name and telephone number of the City's authorized representative to respond in the event of a vibration or noise complaint. If the authorized representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.

c. During the entire active construction period and to the extent feasible, limit construction-related trips (including worker commuting, material deliveries, and debris/soil hauling) from residential areas around the project site.

[13] Note that the City of Torrance does not have specific interior noise level restrictions in either the Noise Element or the Municipal Code.

d. During the entire active construction period, all heavy construction equipment used on the proposed project shall be maintained in good operating condition, with all internal combustion, engine-driven equipment fitted with intake and exhaust muffles, air intake silencers, and engine shrouds no less effective than as originally equipped by the manufacturer.

e. During the entire active construction period and to the extent feasible, use electrically powered equipment instead of pneumatic or internal combustion powered equipment.

f. During the entire active construction period and to the extent feasible, all stationary noise-generating equipment shall be located as far away as possible from neighboring property lines.

g. During the entire active construction period and to the extent feasible, limit all internal combustion engine idling both on the site and at nearby queuing areas to no more than five minutes for any given vehicle or machine. Signs shall be posted at the job site and along queueing lanes to reinforce the prohibition of unnecessary engine idling.

h. During the entire active construction period and to the extent feasible, the use of noise producing signals, including horns, whistles, alarms, and bells will be for safety warning purposes only. Use of smart back-up alarms, which automatically adjust the alarm level based on the background noise level shall be utilized, or back-up alarms shall be turned off and replaced with human spotters.

The above conditions shall be implemented by the construction contractor(s) via a designated health, safety and environmental (HSE) coordinator or a similar person. The details of the construction noise mitigation plan, including those listed above, shall be included as part of the permit application drawing set and as part of the construction drawing set. Verification shall be performed by the City building inspection staff.

MM NOI-2 Where feasible, erect a temporary noise barrier/curtain as close as possible to the drilling rig and pumping units as practical. The term "feasible" is defined in CEQA to mean "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."[14]

These temporary noise barriers/curtains shall be between the drilling rig and all residential receptors that are within 500 feet of the wellhead and shall be relative to all directions from the wellhead that have direct line-of-site access to the drilling equipment; to the extent feasible. For Well Site 1 (Well No. 12), this shall be along the entire well site perimeter. For Well Site 2 (Well No. 13), this shall be along the western, northern, and eastern boundaries of the well site. For Well Site 3 (Well No. 14), this shall be along the entire well site perimeter.

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5. Environmental Impacts

The temporary sound barrier shall have a minimum height of 16 feet. The barrier can be implemented via:

(a) a 1-inch-thick plywood wall

OR

(b) a hanging blanket/curtain with a surface density or at least 2 pounds per square foot. For this configuration, the construction side of the barrier shall have an exterior lining of sound absorption material with a Noise Reduction Coefficient (NRC) rating of at least 0.7.

OR

(c) a stacked arrangement of two standard shipping containers (which would yield a height of 17 feet).

For all the above alternatives, the entire barrier system shall be continuous along the noted site boundaries such that there shall be no holes, gaps, and discontinuities. For all the above alternatives, the entire barrier system, as implemented in the field, shall achieve a Sound Transmission Class (STC) of 35 or greater.

The above conditions shall be implemented by the construction contractor(s) via a designated health, safety and environmental (HSE) coordinator or a similar person. The details of the construction noise mitigation plan, including those listed above, shall be included as part of the permit application drawing set and as part of the construction drawing set. Verification shall be performed by the City building inspection staff.

Impacts with Mitigation Measures

With these mitigation measures, drilling rig noise emissions are expected to be reduced by increments between 20 to as much as 30 dB; depending on the orientation, distance to given receptors, and the intervening pathways (for sound propagation).[15] Late night drilling operations at the three well sites can be expected to be audible above the existing ambient conditions, except for those residences within approximately 300 feet of the I-405 freeway. At times and under heavy load conditions, there may be excursions of the effective Municipal Code limits (as presented in Table 9 above); particularly during the most restrictive period on Sunday mornings (i.e., for the seven hours between midnight and 7 AM). However, because it would only be seven hours out of a weekly set of 168 hours, other periods of drilling are expected to be at or below the 50 dBA nighttime limit, and the mitigation measures would reduce drilling noise to the extent that is reasonably feasible, the implementation of these measures would reduce drilling construction noise to levels that would be less than significant.

[15] More precise numerical benefits that could be expected at individual receptor locations would require complicated and extensive sound propagation modeling efforts, coupled with detailed evaluations of ambient conditions, both of which are beyond the scope and extent of this assessment.

e. For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

No Impact. None of the well or pipeline sites are within an airport land use plan or within two miles of a public use airport. The nearest airports are Hawthorne Municipal Airport, Torrance Municipal Airport, Los Angeles International Airport, and Long Beach International Airport, and all of these are more than two miles from the Van Ness Avenue water wells transmission mains and well sites. Relatedly, the project would not result in changes to the usage at any of these public airport facilities. Therefore, no impacts related to an airport land use plan or a public/public use airport would occur and no mitigation measures would be required.

f. For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

No Impact. There are no private airstrips in the vicinity of the well or pipeline project sites. The nearest private airport/heliport to the project area is the Carson Sheriff Station Heliport, approximately 3.5 miles to the east. Relatedly, the project will not result in changes to the usage at any of these private airport facilities. Therefore, no impacts related to private airstrips would occur, and no mitigation measures would be required.

5. Environmental Impacts

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