3.9 NOISE

3.9.1 Introduction

This section describes the environmental setting for noise within the PMPU area, identifies applicable regulations, and analyzes the potential impacts that could result from implementing the proposed Program. Mitigation measures and the significance of impacts after mitigation also are described.

The analyses in this section focus on impacts to humans and noise-sensitive land uses. The primary discussion of noise conditions, including underwater noise, and impacts on non-human species is presented in Section 3.3, Biological Resources.

3.9.1.1 Noise Fundamentals

Noise may be described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. The nature of sound can be characterized by its *pitch* or its *loudness*. *Pitch* depends on the relative rapidity (frequency) of the vibrations produced by the source. *Loudness* describes the amplitude or intensity of sound waves combined with the reception characteristics of the ear. Amplitude may be compared with the height of an ocean wave: the higher the amplitude, the louder the sound. In general, intermediate pitched signals sound louder to humans than sounds with a lower or higher pitch. Technical acoustical terms commonly used in this section are defined in Table 3.9-1.

Table 3.9-1. Definitions of Acoustical Terms

Term	*Definition*
Sound	A vibratory 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
dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

Table 3.9-1. Definitions of Acoustical Terms

Term	*Definition*
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dB(A))	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective human reactions to noise.
Equivalent Sound Level (L_{eq})	The average A-weighted sound level during the measurement period. The hourly L_{eq} used for this report is denoted as dB(A) $L_{eq[h]}$.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 dB to sound levels in the evening from 7:00 P.M. to 10:00 P.M. and after addition of 10 dB to sound levels in the night between 10:00 P.M. and 7:00 A.M.
L_{dn} (Day/Night Noise Level)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 dB to levels measured in the night between 10:00 P.M. and 7:00 A.M.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive noise	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

3.9.1.1.1 Noise Descriptors

In addition to the concepts of pitch and loudness, several measurement scales are used to describe noise. The dB is a unit of measurement, used herein, that indicates the relative amplitude (loudness) of a sound. Zero on the dB scale is based on the lowest sound pressure that a healthy, unimpaired human ear can detect. It is important to understand that sound levels expressed in dB are calculated on a logarithmic rather than a linear basis and are not additive.

Frequency relates to the number of pressure oscillations per second, or Hertz (Hz). The range of sound frequencies that can be heard by healthy human ears varies from about 20 Hz at the low frequency end to 20,000 Hz (20 kilohertz) at the high frequency end. Sensitivity of the human ear to very high or very low frequencies on this scale is less than for intermediate frequencies.

There is also a relationship between the subjective loudness of a sound and its level. Each 10-dB (tenfold) increase in sound pressure level is perceived as an approximate doubling of loudness over a wide range of amplitudes. If two sounds of equal sound pressure level are added together at the same location, the result is a sound pressure level that is 3 dB higher (that is, a doubling of sound pressure level results in a 3 dB increase in measured sound, which is barely audible to the human ear). For example, the noise from two sources of 70 dB and 70 dB at the same location would result in a sound level measuring 73 dB. In the same way, for construction equipment, when two pieces of equipment are operating simultaneously, the incremental sound pressure level contributed by the second piece of equipment depends on the difference between the

two noise levels. If there is a difference of 0-1 dB between the two pieces of equipment (that is, they are nearly the same), the resultant sound pressure level would be 3 dB above the noise level of the louder piece of equipment. A difference of 2-3 dB would cause the total sound pressure level to be 2 dB above the higher noise level, and a difference of 4-9 dB would cause the total sound pressure level to be 1 dB above the higher noise level. A 10 dB difference or more would result in a total sound pressure level of 0 dB above the higher noise level — the difference added by the second piece of equipment would not be audible in most cases.

There are several methods of characterizing sound. The most common is the A-weighted sound level or dB(A). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Studies have shown that the A-weighted level is closely correlated with annoyance to traffic noise. Other frequency weighting networks, such as C weighting or dB(C), have been devised to describe noise levels for specific types of noise (e.g., explosives), but are not applicable to this analysis. Table 3.9-2 shows typical A-weighted noise levels that occur in human environments.

Table 3.9-2. Typical Noise Levels in the Environment

Common Outdoor Noise Source	*Noise Level (dB(A))*	*Common Indoor Noise Source*
	120 dB(A)	
Jet fly-over at 1,000 feet		Rock concert
	110 dB(A)	
Pile driver at 100 feet - L_{max}	100 dB(A)	
		Night club with live music
	90 dB(A)	
Large truck passes by at 50 feet		
	80 dB(A)	Noisy restaurant
		Garbage disposal at 3.3 feet
Gas lawn mower at 100 feet	70 dB(A)	Vacuum cleaner at 9.8 feet
Commercial/Urban area daytime		Normal speech at 3.3 feet
Suburban expressway at 300 feet	60 dB(A)	
Suburban daytime		Active office environment
	50 dB(A)	
Urban area nighttime		Quiet office environment
	40 dB(A)	
Suburban nighttime		
Quiet rural areas	30 dB(A)	Library
		Quiet bedroom at night
Wilderness area	20 dB(A)	
	10 dB(A)	Quiet recording studio
Threshold of human hearing	0 dB(A)	Threshold of human hearing

Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called equivalent sound level (L_{eq}). A common averaging period is hourly, but L_{eq} can describe any series of noise events of any duration. The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within approximately plus or minus 1 dB(A). Two metrics describe the 24-hour average, L_{dn} and community noise equivalent level (CNEL). Both include penalties (i.e., disproportionate weighting) for noise during the nighttime, and CNEL also penalizes noise during the evening. CNEL and L_{dn} are normally within 1 dB(A) of each other.

3.9.1.1.2 Sound Propagation

When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise is reduced with distance depends on the following important factors.

- *Geometric spreading from point sources.* Sound from a single source (i.e., a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of 6 dB(A) for each doubling of distance (intensity drops to one-quarter of the previous level with each doubling of distance).
- *Geometric spreading from line sources.* Some sound generators are not point sources. Highway noise, for example, is not a single stationary point source of sound. The movement of vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a "line" source) rather than from a point. This results in cylindrical spreading rather than the spherical spreading resulting from a point source. The change in sound level from a line source is 3 dB(A) per doubling of distance (intensity drops to one-half of the previous level with each doubling of distance).
- *Ground absorption.* Usually the noise path between the source and the observer is very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation because of geometric spreading. Traditionally, the *excess* attenuation over geometric spreading is also expressed in terms of attenuation per doubling of distance. This approximation is done for simplification only; for distances of less than 200 feet, prediction results based on this scheme are sufficiently accurate. For acoustically "hard" sites (i.e., sites with a reflective surface, such as a parking lot or a smooth body of water, between the source and the receiver), no excess ground attenuation is assumed. For acoustically absorptive or "soft" sites (i.e., sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB(A) per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation for a soft site results in an overall drop-off rate of 4.5 dB(A) (3 + 1.5) per doubling of distance for a line source and 7.5 dB(A) (6 + 1.5) per doubling of distance for a point source. Although some ground attenuation is expected, it is often ignored, as here, for a noise analysis to ensure conservatism and is very difficult to characterize accurately in any event.
- *Atmospheric effects.* Research by Caltrans and others has shown that atmospheric conditions can have a major effect on noise levels within 200 feet of a highway. Wind has been shown to be the single most important meteorological factor within approximately 500 feet, whereas vertical air temperature gradients are more important over longer distances. Other factors, such as air temperature, humidity, and turbulence, also have major effects. Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels. Increased sound levels can also occur because of temperature inversion conditions (i.e., increasing temperature with elevation) which cause reflection of sound from the inversion layer back to the ground. As with ground absorption, atmospheric effects are often ignored, as here, in the interest of a conservative analysis.

- *Shielding by natural or human-made features.* A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by this shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. A higher barrier may provide as much as 20 dB of noise reduction. Lightly built barriers or vegetation provide less attenuation.

3.9.1.1.3 Human Response to Noise

Studies have shown that under controlled conditions in an acoustics laboratory, a healthy human ear is able to discern changes in sound levels of 1 dB(A). In a quiet environment with average background noise, a healthy human ear can detect changes of about 2 dB(A). However, it is widely accepted that changes of 3 dB(A) in the normal environment are just noticeable to most people, and that an increase of 3 dB(A) is perceived as approximately a 25 percent increase in noise level. A change of 5 dB(A) is readily perceptible and an increase of 10 dB(A) is perceived as being twice as loud even though it results from a tenfold increase in sound pressure level.

A number of studies have linked increases in noise with health effects, including hearing impairment, sleep disturbance, cardiovascular effects, psychophysiological effects, and potential impacts to fetal development (Babisch 2005). Potential health effects appear to be caused by both short and long term exposure to very loud noises and long term exposure to lower levels of sound (chronic exposure). Acute exposure to sound levels greater than 120 dB can cause mechanical damage to hair cells of the cochlea (the auditory portion of the inner ear) and hearing impairment (Babisch 2005). As noted in Table 3.10-2, sound levels greater than 120 dB are equivalent to a rock concert or a jet plane flying overhead at 1,000 feet.

The World Health Organization (WHO) and the USEPA consider L_{eq} = 70 dB(A) to be a safe daily average noise level for the ear. Some research has suggested that even this "ear-safe" level may cause disturbance to sleep and concentration and may be linked to chronic health impacts such as hypertension and heart disease (Babisch 2006). A number of studies have looked at the potential health effects from the sound of chronic lower noise levels, such as traffic, especially as these noise levels affect children. In a study of school children in Germany, blood pressure was found to be 10 millimeters of mercury higher in a group of students exposed to road traffic noise from high traffic transit routes (Babisch 2006). A study by Kawada (2004) showed that in pregnant women, exposure to airplane noise was found to be associated with decreased fetal body weight.

However, an analysis of 43 epidemiological studies of the association between noise exposure and blood pressure and ischemic heart disease (van Kempen et al. 2002) found no statistically significant correlation between community exposure and heart disease, although small but statistically significant correlations were found for occupational exposures. The study also found a positive correlation between high blood pressure and elevated noise exposure in the workplace. It was not, however, able to identify a threshold above which significant health effects could be expected

to occur in the general population. The analysis concluded that "epidemiological evidence on noise exposure, blood pressure, and IHDs [ischemic heart diseases] is still limited" (van Kempen et al. 2002).

In conclusion, there appears to be a relationship between exposure to higher than normal noise levels and some health effects, though the evidence is inconsistent at this time. Recent research has not unequivocally identified community noise levels above which specific health effects may occur. In the absence of more definitive research, a sound level of 120 dB(A) may be a suitable threshold above which acute exposure would be health threatening. Similarly, chronic exposures above the 70 dB(A) threshold used by the WHO and USEPA may potentially be health threatening.

3.9.1.2 Vibration Fundamentals

Ground vibration is commonly measured as "VdB", which is the dB quantification of the average (designated as the root mean square [RMS]) vibration velocity relative to a standard reference level). Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceptible vibration levels inside residences are usually attributed to the operation of heating and air conditioning systems, door slams, and foot traffic. Construction activities, train operations, and street traffic are some of the most common external sources of vibration that can be perceptible inside residences. Table 3.9-3 summarizes common sources of vibration and the association to human perception or the potential for structural damage. Note that pile driving, as would be used for some of the proposed appealable/fill projects under the proposed Program, represents one of the highest levels of vibration.

Table 3.9-3. Typical Levels of Groundborne Vibration

Typical Events (50 foot setback)	*Velocity Level, VdB (re 1µinch/sec, RMS)*	*Human/Structural Response*
Blasting, pile driving, vibratory compaction equipment	**100**	Threshold, minor cosmetic damage
Heavy tracked vehicles (Bulldozers, cranes, drill rigs)	**90**	Difficulty with tasks such as reading a video or computer screen
Freight rail, typical Commuter rail, upper range		
Rapid transit, upper range	**80**	Residential annoyance, infrequent events
Commuter rail, typical Bus or truck over bump or on rough roads		Residential annoyance, frequent events
Rapid transit, typical	**70**	
Buses, trucks and heavy street traffic	**60**	Limit for vibration sensitive equipment. Approximate human threshold of perception to vibration
Background vibration in residential settings in the absence of activity	**50**	Lower limit for equipment ultra-sensitive to vibration

Source: Illingworth & Rodkin, Inc. and USDOT 2006

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. Rattling sounds can give rise to vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise that causes induced vibration in exterior doors and windows.

3.9.2 Environmental Setting

Existing ambient (background) noise levels in the PMPU area are primarily the result of vehicular traffic on local street networks and the freeways, railroad train movements along the various railroad lines in the area, industrial noise sources, and other activities at the Port. In general, average noise levels in an area are directly determined by local noise generating activity. Unless such activity in the area changes dramatically, average noise levels also do not change appreciably over time. For example, a doubling of noise generating activity of the same or similar type (e.g. traffic with the same or similar distribution of vehicular types) results in a 3 dB(A) increase in noise levels which, as discussed above, would be considered just noticeable to most people. Therefore, background noise measurements will tend to be reasonably consistent over time provided there has been no substantial change in noise generating activity.

3.9.2.1 Regional Setting

The PMPU area includes areas south and east of the communities of Wilmington and San Pedro, respectively. The PMPU area is characterized by industrial and Port facilities, visitor-serving commercial areas, marine service and support facilities, and open space and recreational areas. Noise-sensitive uses are defined in the *Los Angeles Department of City Planning Noise Element* to include single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodgings and other residential uses; houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves, and parks (City of Los Angeles 1999). Noise-sensitive uses in the PMPU vicinity include single- and multi-family residences located in San Pedro and Wilmington as well as liveaboards in marinas at various locations within the Port. Noise-sensitive uses are also located along the rail corridors in the Port region.

3.9.2.2 PMPU Area Existing Noise Environment

The proposed Program is located in the Wilmington and San Pedro Districts of the City of Los Angeles. Noise levels in the area primarily result from the vehicular traffic, railroad, and industrial noise sources and activities at the Port noted in Section 3.9.2, Environmental Setting. The noise environment at any particular location depends on proximity to the various noise sources. Noise-sensitive uses are also located along the rail corridors in the Port region. Noise-sensitive uses in the PMPU vicinity include single- and multi-family residences located in San Pedro and Wilmington as well as liveaboards in marinas at various locations within the Port.

3.9.2.3 PMPU Area Existing Vibration Environment

Vibration-sensitive receivers comprise vibration sensitive commercial uses; single- and multi-family residences; institutional uses such as fire stations, schools, and child development facilities; and, adult education centers. Ground-borne vibration at the sensitive receivers in the study area would be generated primarily by heavy trucks and trains. The amount of vibration experienced at each receiver is dependent on the source type, source to receiver distance, soil characteristics, vehicle type/weight, pavement type/condition, and rail type/condition.

3.9.3 Applicable Regulations

The only regulations that apply to noise are federal and local. There are no applicable state regulations.

3.9.3.1 Federal Regulations

3.9.3.1.1 Federal Highway Administration Noise Standards

The Federal Highway Administration (FHWA) has adopted noise standards, regulations, and policies related to traffic noise. Caltrans discusses these standards in detail and provides guidance in the Traffic Noise Analysis Protocol (Caltrans 2011). Federal regulations addressing highway noise are defined in 23 CFR Part 772. However, these standards are not directly applicable to the proposed Program because it is not a Type 1 federally funded highway improvement project.

3.9.3.1.2 Federal Transit Authority Transit Noise and Vibration Impact Assessment

The Federal Transit Authority (FTA) includes in its guidance a methodology to evaluate construction noise and rail vibration impacts. The methodology is included in Chapters 8, 9, and 12 of the FTA assessment guidance and has been incorporated into this section to evaluate rail vibration and construction noise impacts (Illingworth & Rodkin, Inc. and USDOT 2006).

3.9.3.2 Local Regulations

The City of Los Angeles has defined questions to be addressed in the IS to assess the potential for noise impacts (*L.A. CEQA Thresholds Guide*, Appendix I):

- Would the project result in 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?
- Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

- Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the PMPU area to excessive noise levels?
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the PMPU area to excessive noise levels?

3.9.3.2.1 Los Angeles Municipal Code

Noise regulations applicable to Port activities are contained in the LAMC. Section 41.40 of the code prohibits construction work that involves certain types of heavy equipment, and most support activities, between the hours of 9 P.M. and 7 A.M. Chapter 11, Section 112.05 of the code establishes maximum noise levels and hours or operation for powered equipment or powered hand tools.

3.9.3.2.2 City of Los Angeles General Plan Noise Element

The Noise Element of the *City of Los Angeles General Plan* contains a number of goals, objectives, and policies pertaining to the noise environment of the city (City of Los Angeles 1999). The goal of the General Plan is to achieve "A city where noise does not reduce the quality of urban life." The plan includes a number of objectives focused on reducing noise from Port operations. Specific programs under the Noise Element that are directly relevant to Port operations include P2 (noise abatement measures), P3 (noise compatibility measures), P11 (mitigation measures), P13 (noise minimization design and construction), and P18 (Use of Alameda Corridor).

3.9.4 Impacts and Mitigation Measures

3.9.4.1 Methodology

Potential impacts to sensitive receptors as a result of the proposed appealable/fill projects under the proposed Program are assessed through a comparison of data presented in references (including applicable noise standards) and results from past projects in the Port to estimated noise levels and other consequences of the proposed Program using scientific expertise of the preparers. Because sound attenuates rapidly with distance, noise is generally a localized phenomenon, dependent on local noise-generating activities. While traffic growth may contribute over long periods to increases in noise levels, it would take a doubling of traffic to result in a readily audible change in noise level of 3 dB. Thus, over long periods, average noise levels in an area tend to remain fairly constant absent a significant increase in local noise-generating activities. Therefore, no upward trend in general ambient noise levels over time is assumed from baseline conditions.

The impacts of noise levels resulting from implementation of the proposed Program were estimated based on the proximity of sensitive uses to construction and operation

activities associated with the proposed appealable/fill projects and associated land use changes. Construction and operations involving equipment that would produce noise levels exceeding impact criteria at specific distances from sensitive receptors would have significant impacts.

Noise levels for various sources used in the analysis were based on levels reported in Table I.1-1 of the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006), previous data collected at the Port, previous environmental documents, and/or from the available literature. Future transportation noise exposure and increases in transportation noise levels relative to existing noise conditions were estimated based on a comparison of existing and future project-generated traffic volumes on the main roadways in proximity to sensitive uses.

Impacts to the existing noise environment are evaluated both in the context of land use designation changes and with respect to the proposed appealable/fill projects that are identified under the proposed Program.

3.9.4.2 Thresholds of Significance

The *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) is the basis for the following significance criteria and for determining significance of impacts on noise resulting from the proposed Program. The NOP/IS (Appendix B) concluded that the proposed Program would have no impact under the following thresholds; therefore, these significance criteria were not carried forward for detailed analysis:

- For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?
  - The proposed appealable/fill projects and land use changes associated with proposed Program would not be located within an airport land use plan area or within 2 miles of a public airport or public use airport. The closest public airport, Long Beach Airport, is located approximately 9 miles from the PMPU area. Therefore, the proposed Program would not result in a safety hazard to people working or residing in the PMPU area.
- For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?
  - The proposed appealable/fill projects and land use changes associated with proposed Program would not be located within the vicinity of a private airstrip. The closest private use airport is the Torrance Municipal Airfield located approximately 6.5 miles from the PMPU area. Therefore, the proposed Program would not result in a safety hazard to people working or residing in the PMPU area.

Noise impacts would be significant under the following conditions.

NOI-1: Daytime construction activities lasting more than 10 days in a 3-month period would produce noise levels that exceed existing ambient exterior noise levels by 5 dB(A) or more at a noise-sensitive use.

NOI-2: Construction activities would produce noise levels that exceed the ambient noise level by 5 dB(A) at a noise-sensitive use between the hours of 9:00 P.M. and 7:00 A.M. Monday through Friday, before 8:00 A.M. or after 6:00 P.M. on Saturday, or at any time on Sunday.

NOI-3: Construction or operation would expose persons to or generate excessive groundborne vibration or groundborne noise levels.

NOI-4: The ambient noise level measured at the property line of affected uses would increase by 3 dB(A) in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or any 5 dB(A) or greater noise increase, as defined by City thresholds, described in Table 3.9-4.

Table 3.9-4. Land Use Noise Compatibility Guidelines

Land Use	*Community Noise Exposure CNEL, dB*			
	Normally Acceptable	*Conditionally Acceptable*	*Normally Unacceptable*	*Clearly Unacceptable*
Single Family, Duplex, Mobile Homes	50-60	55-70	70-75	above 70
Multi-Family Homes	60-65	60-70	70-75	above 70
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	above 80
Transient Lodging — Motels, Hotels	50 – 65	60 - 70	70-80	above 80
Auditoriums, Concert Halls, Amphitheaters	---	50 - 70	---	above 65
Sports Arena, Outdoor Spectator Sports	---	50 - 75	---	above 70
Playgrounds, Neighborhood Parks	50-70	---	67-75	above 72
Golf Courses, Riding Stables, Water, Recreation, Cemeteries	50 - 75	---	70-80	above 80
Office Buildings, Business and Professional Commercial	50-70	67 - 77	above 75	---
Industrial, Manufacturing, Utilities, Agriculture	50 - 75	70 - 80	above 75	---
Normally Acceptable: Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements. *Conditionally Acceptable:* New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice. *Normally Unacceptable:* New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. *Clearly Unacceptable:* New construction or development should generally not be undertaken.				
Source: City of Los Angeles 2006				

3.9.4.3 Impacts and Mitigation

Impact NOI-1: Daytime construction activities lasting more than 10 days in a 3-month period would produce noise levels that

exceed existing ambient exterior noise levels by 5 dB(A) or more at a noise-sensitive use.

The impact criterion relates only to construction, so operational impacts are not discussed in the analyses for this criterion.

Table 3.9-5 lists the noise levels for a range of construction equipment at a reference distance of 50 feet representing levels that would occur during the noisiest construction activities (i.e., L_{max}). The noise levels used in the analysis are identified in Table 3.9-6 and include pile driving, grading and paving associated with site preparation, and trenching.

Table 3.9-5. Construction Equipment Noise Emission Levels

Equipment Type	*Typical Noise Level (L_{max}) (dB(A)) 50 feet from Source*
Front Loader	73-86
Trucks	82-95
Cranes (moveable)	75-88
Cranes (derrick)	86-89
Vibrator	68-82
Saws	72-82
Pneumatic Impact Equipment	83-88
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Back Hoe	73-95
Pile Driving (peaks)	95-107
Tractor	77-98
Scraper/Grader	80-93
Paver	85-88
Source: L.A. CEQA Thresholds Guide (City of Los Angeles 2006), Appendix I, Table I.1-1	

Table 3.9-6. Noise Emission Levels used in Construction Impact Assessment

Equipment Type	*Typical L_{max}*	*L_{eq} (one hour)**
Aggregate of typical construction equipment @ 50 feet	91 dB(A)	87 dB(A)
Pile driver @ 50 feet	107 dB(A)	100 dB(A)
Note:* Calculated based on hourly average equipment utilization.		

During construction, the overall average noise levels vary with the level of construction activity, the types of equipment that are onsite and operating at a particular time, and the proximity of the construction equipment to noise-sensitive land uses. Hourly average noise levels presented in Table 3.9-6 are estimates based on typical construction equipment that would be expected to be onsite during

construction of the proposed appealable/fill projects and development associated with the proposed land use changes.

Construction of the proposed appealable/fill projects and development associated with the proposed land use changes would likely involve a range of heavy equipment for excavating and pile driving, along with associated truck and vehicle traffic. Noise levels generated by construction equipment would vary depending on factors such as the type of equipment, engine type, horsepower, the specific model, the activity being performed, and the condition of the equipment. The L_{eq} of the construction activities also depends on the fraction of time that the equipment is active over the time period of construction. Few pieces of construction equipment operate all the time; most only operate some fraction of a typical hour (in the range of 20 to 40 percent). This fraction is taken into account in the impact analyses. The dominant source of noise from most construction equipment is engines, although the noise generated by impact pile-driving or pavement-breaking can be dominant when these activities are occurring.

As noted in Section 3.0, Environmental Analysis, project-level details are not available for many of the proposed appealable/fill projects and fewer details are known regarding development associated with the proposed land use changes. Consequently, project requirements for installing pilings are uncertain. Pile driving is included in these assessments as worst case conditions because it represents the highest noise emission levels associated with construction activities.

It is likely that construction activities would last more than 10 days in any 3-month period under the proposed Program. An impact would be considered significant if noise from these activities would cause the existing ambient exterior L_{eq} noise levels to increase by 5 dB(A) or more at a sensitive receptor. Near-Port communities that could be affected by construction include portions of San Pedro within 1,650 feet of pile driving operations (for construction occurring in the vicinity of the Main Channel, Terminal Island, and Pier 400) and liveaboards in the East Basin/Berth 200 area within 1,650 feet of pile driving operations.

Traffic Noise

During construction of the proposed appealable/fill projects or construction associated with proposed land use changes, workers would be distributed among various sites and trucks would be delivering building supplies to each site. Trucks typically would deliver supplies and equipment during non-peak hours. Construction worker based vehicle trips would represent a small fraction of the A.M. and P.M. peak hour traffic volumes in the PMPU area since typical construction schedules start and end earlier in the day than most business shifts. This small fraction of vehicles compared to the overall traffic in the PMPU area would not result in a noticeable increase in noise levels. A doubling of traffic would be required for a minimally audible 3 dB(A) increase in L_{eq} noise levels to occur (FHWA 1995).

Marine Terminal and Commercial Construction Noise

A noise emission level, representing a combined L_{max} level of 91 dB(A) at 50 feet (Table 3.9-6), was used as the source noise level consistent with FHWA model recommendations for general construction (FHWA 2006). For pile driving, a noise

emission level of 107 dB(A) at 50 feet was used based on the large size of piles typically used for wharf construction and the noise levels that driving such piles can produce (Table 3.9-6). Noise levels from construction would likely exceed ambient levels (assumed generally to be 65 dB(A) L_{eq}) by more than 5 dB at distances of 400 feet or less for either pile driving or general construction. At distances of more than 400 feet, pile driving would still exceed ambient L_{eq} levels by more than 5 dB, but general construction noise would be below 5 dB at that distance. At distances of 1,650 feet or more, neither pile driving nor general construction noise would exceed the City of Los Angeles threshold.

Planning Area 2

Proposed appealable/fill projects in Planning Area 2 include the Berths 187-189 Liquid Bulk Relocation, Yang Ming Terminal Redevelopment, and China Shipping Fill. The Berths 187-189 Liquid Bulk Relocation Project and associated land use changes would involve relocating bulk liquid storage from Slip 5 to Berths 191-194 in the East Basin. The Yang Ming Terminal Redevelopment Project would involve 6 acres of fill and 3 acres of cut (designated container areas), as well as eliminating the Kinder Morgan liquid bulk facility at Berths 118-120. The China Shipping Fill Project would involve 16 acres of fill at Berth 102 to expand the container area. Land use changes in Planning Area 2 would include converting break bulk to liquid bulk at a location on Mormon Island.

Construction

Construction related to the proposed appealable/fill projects and associated land use changes noted above would likely involve a range of heavy equipment for excavating and pile driving, along with associated truck and vehicle traffic. The Berths 187-189 Liquid Bulk Relocation Project may involve pile driving at the face of Berths 191-194, as well as possible pile driving for upland foundations, to make the facility MOTEMS compliant. Liveaboards in the East Basin marinas are less than 1,650 feet from the face of Berths 191-194 and would be exposed to pile driving noise from construction at L_{eq} levels greater than 5 dB(A) above ambient. The Yang Ming Terminal Redevelopment Project may involve pile diving to create 3,400 feet of new container wharf. Sensitive receptors in the Community of San Pedro are more than 1,650 feet from the face of the Yang Ming container terminal. General construction not mentioned herein could occur within 400 feet of sensitive receptors and would potentially result in sensitive receptors being exposed to noise at L_{eq} levels greater than 5 dB(A) above ambient.

Planning Area 3

The proposed appealable/fill project in Planning Area 3 is the Berth 300 Development Project involving 18 acres of fill to be designated for container uses. Proposed land use changes in Planning Area 3 would include: changing the institutional area between Seaside Avenue and Reeves Avenue to maritime support; changing vacant land south of Reeves Avenue to maritime support; changing vacant land along Ferry Street to maritime support; changing existing liquid bulk area north of the TIWRP to container area; changing vacant land, commercial fishing, and industrial areas near Fish Harbor to container area; changing the break bulk and vacant area at Berths 206-212 to container areas with options for dry bulk; and

converting Berth 301, an optional use site, from maritime support to liquid bulk or container. The Berth 301 upgrades could involve structures and infrastructure, including wharf upgrades per the MOTEMS and an underground pipeline for transferring product to the LAXT rail loop. Container area on Pier 400 would be converted to maritime support. The institutional area south of Pier 400 would be changed to open space (least tern habitat) although this would be a definition change, not a land use change, and would involve no change in noise generating activities.

Construction

Construction of the Berth 300 Development Project would likely involve a range of heavy equipment for excavating and pile driving, along with associated truck and vehicle traffic. Conversion of Berth 301 to a liquid bulk facility also could require pile driving and excavation. Currently, there are liveaboards within the Al Larson Marina that are within 1,650 feet of the sites of the Berth 300 Development Project and the Berth 301 land use change. Pile driving noise at L_{eq} levels greater than 5 dB(A) above ambient would occur at the Al Larson Marina site. However, liveaboards would be removed from the marina as a result of proposed appealable/fill projects within Planning Area 4. Thus, noise impacts potentially would occur at the Al Larson Marina if either of the Berth 300 Development Project or Berth 301 land use change occurred before the Al Larson Marina project was initiated. These impacts would be analyzed further when project-specific information becomes available. Construction would not occur close enough to other sensitive noise receptors to experience construction noise exceeding ambient levels by more than 5 dB(A). General construction not mentioned herein could occur within 400 feet of sensitive receptors and would potentially result in sensitive receptors being exposed to noise at L_{eq} levels greater than 5 dB(A) above ambient.

Planning Area 4

Proposed appealable/fill projects for Planning Area 4 include the Tri Marine Expansion, 338 Cannery Street Adaptive Reuse, and Al Larson Marina projects. The Al Larson Marina would involve a land use change from recreational boating to maritime support. In addition, vacant land at Southwest Marine Shipyard would be changed to maritime support and break bulk, and vacant land, commercial fishing, liquid bulk, and institutional land uses at Fish Harbor would be replaced with commercial fishing, and maritime support.

Construction

Construction of the proposed appealable/fill projects noted above would likely involve a range of heavy equipment for excavating and pile driving, along with associated truck and vehicle traffic. As noted for Planning Area 3, pile driving noise at L_{eq} levels greater than 5 dB(A) above ambient would occur at the Al Larson Marina site. Thus, noise impacts potentially would occur at the Al Larson Marina if pile driving associated with any of appealable/fill projects or land use changes occurred before the Al Larson Marina project was initiated. These impacts would be analyzed further when project-specific information becomes available. General construction not mentioned herein could occur within 400 feet of sensitive receptors and would potentially result in sensitive receptors being exposed to noise at L_{eq} levels greater than 5 dB(A) above ambient.

Impact Determination

Construction

There is generally a buffer of industrial land uses between the proposed appealable/fill project sites and potential sensitive receptors, including intervening buildings and industrial facilities (tank farms, storage yards, and rail rights of way), that serve to attenuate noise from the industrial land uses. However, liveaboards in the East Basin Berth 200 area would be within 1,650 feet of possible pile driving activities associated with construction of the Berths 187-189 Liquid Bulk Relocation Project (at the face of Berths 191-194 or in the immediate upland vicinity for structure foundations) in Planning Area 2, and would likely experience noise levels greater than the 5 dB(A) threshold. Consequently, construction-related noise impacts would be potentially significant. Also, liveaboards presently reside within 1,650 feet of possible pile driving activities associated with construction of proposed appealable/fill projects and land use changes in Planning Areas 3 and 4. However, these liveaboards may be relocated as a result of the proposed Al Larson Marina Project. Therefore, the potential for significant noise impacts at these locations would depend on the relative timing of the individual projects. Other proposed appealable/fill projects and development associated with proposed land use changes in Planning Areas 2, 3, and 4 would be greater than 1,650 feet from sensitive receptors and would not cause ambient noise levels to be exceeded by more than 5 dB(A). General construction not mentioned herein could occur within 400 feet of sensitive receptors and would potentially result in sensitive receptors being exposed to noise at L_{eq} levels greater than 5 dB(A) above ambient.

Mitigation Measures

The following mitigation measures would be implemented, as applicable, for the proposed appealable/fill projects and land use changes associated with the proposed Program.

MM NOI-1: Construction Hours. Construction shall be limited to the hours of 7:00 A.M. to 6:00 P.M. on weekdays, between 8:00 A.M. and 6:00 P.M. on Saturdays, and construction equipment noise shall be prohibited anytime on Sundays and holidays.

MM NOI-2: Construction Days. Noise-generating construction activities shall not be conducted on weekends or holidays.

MM NOI-3: Construction Equipment. All construction equipment powered by internal combustion engines shall be properly muffled and maintained.

MM NOI-4: Idling Prohibitions. Unnecessary idling of internal combustion engines near noise-sensitive areas shall be prohibited.

MM NOI-5: Equipment Location. All stationary noise-generating construction equipment, such as air compressors and portable power generators, shall be located as far as practical from existing noise-sensitive land uses.

MM NOI-6: Notification. Residents adjacent to the proposed Program sites shall be notified, in writing, of the construction schedule.

MM NOI-7: Use Quiet Equipment. Contractors shall utilize the quietest equipment available, and all internal combustion powered equipment shall be equipped with properly operating mufflers and kept in tune to avoid backfires. In addition, if exposed, engines shall be fitted with protective shrouds to reduce motor noise.

MM NOI-8: Use Electrical Power when feasible. If ample local grid power is available, electricity shall be obtained from the local power grid to avoid the use of portable generators.

MM NOI-9: Disturbance Coordinator. A disturbance coordinator shall be designated for responding to noise complaints, with his/her name and telephone number to be clearly posted at the construction site.

MM NOI-10: Restricted Pile Driving Hours. In order to reduce the potential impact during construction, pile driving activities shall be limited to between the hours of 9:00 A.M and 5:00 P.M. on Monday-Friday and 10:00 A.M. to 4:00 P.M. Saturday.

MM NOI-11: Temporary Noise Barriers. Erect temporary noise attenuation barriers adjacent to stationary construction equipment directly between the equipment and sensitive receptors, where necessary and feasible. Construction equipment that is to be stationary for extended periods (e.g., compressors, generators, etc.) shall be shielded, if appropriate, by erecting temporary noise attenuation barriers. The need for and feasibility of noise attenuation barriers shall be evaluated on a case-by-case basis considering the distance to noise-sensitive receptors, the available space at the construction location, and taking account of safety and operational considerations. Noise attenuation barriers suitable for pile driving equipment shall be considered using the same criteria. If used, the barriers shall be installed directly between the equipment and the nearest noise-sensitive use to the construction site.

Residual Impacts

The above mitigation measures are not anticipated to reduce residual construction impacts of Impact NOI-1 to less than significant levels in all cases. Noise impacts from construction of the proposed appealable/fill projects at distances from sensitive receptors of less than 1,650 feet for pile driving and 400 feet for general construction would be significant and unavoidable. While noise attenuation measures, such as use of noise barriers and construction procedures, may be applicable and are likely to reduce sound levels from construction, functional constraints and uncertainties as to the effectiveness of available measures or the availability of equipment with lower noise emissions may limit the effectiveness of mitigation. In addition, even with noise attenuation devices, the noise of pile driving would be audible and may be perceived as intrusive or annoying by some individuals. While residual impacts of construction or pile driving are considered significant and unavoidable, given the limited duration of construction activities, the impacts would be short term.

Impact NOI-2: Construction activities would not produce noise levels that exceed the ambient noise level by 5 dB(A) at a noise-

sensitive use between the hours of 9:00 P.M. and 7:00 A.M. Monday through Friday, before 8:00 A.M. or after 6:00 P.M. on Saturday, or at any time on Sunday.

The impact criterion relates only to construction, so operational impacts are not discussed in the analyses for this criterion.

Planning Areas 2 - 4

Construction

LAMC Section 41.40 prohibits certain construction activities between the hours of 9 P.M. and 7 A.M.; it is assumed that construction activities associated with the proposed appealable/fill projects and development for proposed land use changes would not violate the code provision. Accordingly, no construction activities would occur within 500 feet of a residential zone before 8:00 A.M. or after 6:00 P.M. on Saturday or any time on Sunday.

Impact Determination

Construction

Proposed appealable/fill projects and land use changes would be required to comply with the limitations on construction noise as specified by Los Angeles LAMC, Section 41.40 that prohibit certain construction activities between the hours of 9 P.M. and 7 A.M. from Monday through Friday, and additionally prohibit construction activities within 500 feet of a residential zone before 8:00 A.M. or after 6:00 P.M. on Saturday or any time on Sunday. Construction would not occur during prohibited hours; therefore, no noise impacts would occur.

Mitigation Measures

No mitigation is required.

Residual Impacts

No residual impacts would occur.

Impact NOI-3: Construction or operation would not expose persons to or generate excessive groundborne vibration or groundborne noise levels.

Construction

Pile driving is the most likely source of vibration during construction, although heavy truck traffic in close proximity to receptors may also result in perceptible vibration over shorter distances. Pile driving during construction can result in two main concerns: 1) airborne noise created by the operation of the pile driver and its impact on the pile being driven (addressed above); and, 2) vibration transmitted through the earth, which results from the impact from the pile driver and subsequent transmission through the pile to the sub-surface strata. This vibration can, under some

circumstances, damage structures and create annoyance to sensitive receptors. However, in general, vibration resulting from pile driving at distances of more than 50 feet is well below the threshold of damage for even the most sensitive structure (90 VdB) as shown in Figure 3.9-1. Distances for other vibration impacts (e.g. annoyance) would be greater.

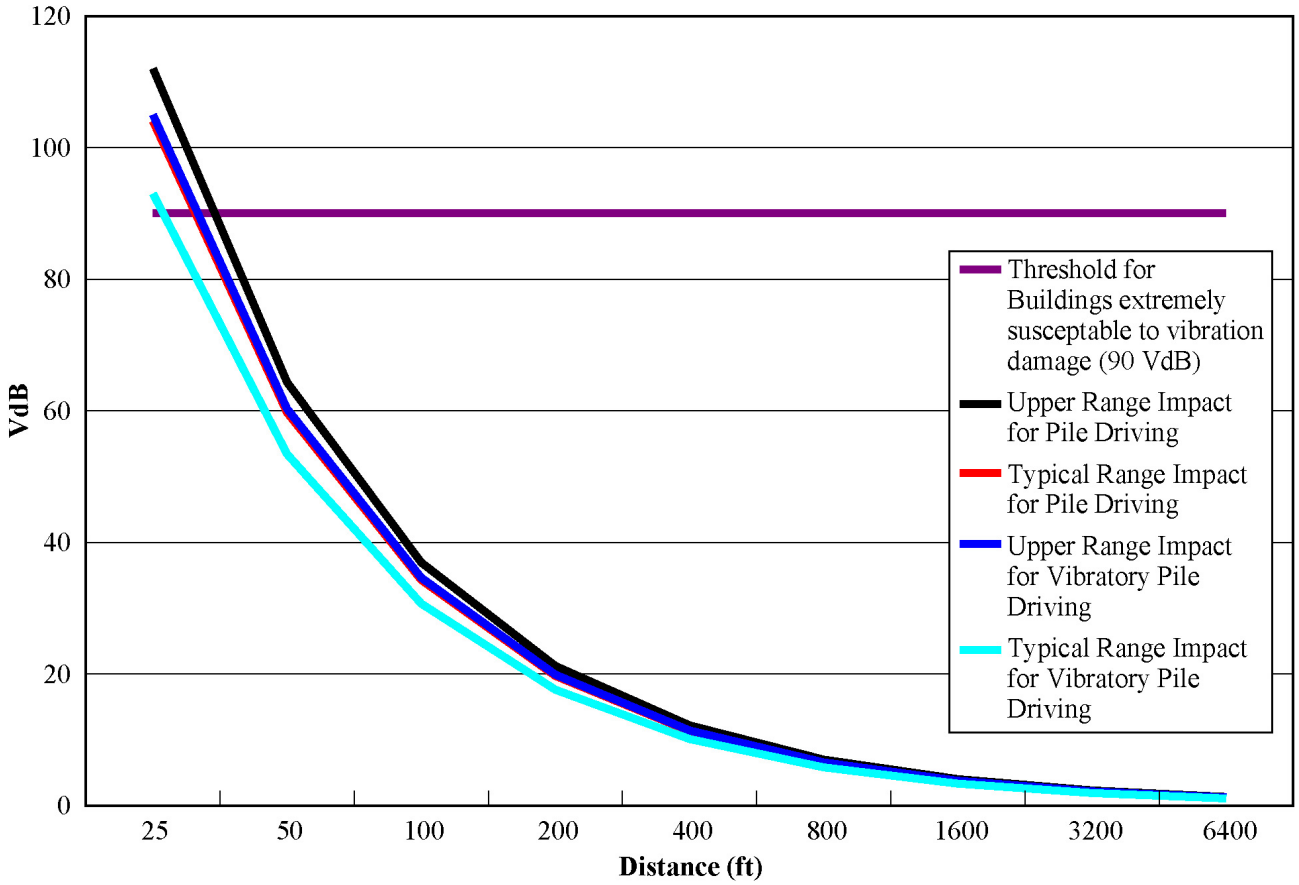

Figure 3.9-1. Potential for Structural Damage from Vibration

USDOT (2006) specifies thresholds for annoyance, the lowest being Category 1 (buildings where vibration would interfere with interior operations). In the Port area, Category 1 land uses are located well beyond the range where pile driving and other construction or operational activities would be likely in association with the proposed Program.

Operations

Principal sources of operational vibration are rail and truck traffic. The potential increase in truck traffic that would occur from the proposed appealable/fill projects and land use changes under the proposed Program would be a relatively small fraction of overall vehicular traffic (Section 3.12, Transportation and Circulation) and not likely to expose persons to excessive groundborne vibration. Rail traffic is expected to increase more than fourfold between 2011 and 2035 under the proposed

Program (Section 3.12, Transportation and Circulation). As indicated in Table 3.9-3, truck and rail vibration events can result in ground vibration levels of 70 to 90 VdB at 50 feet that could produce annoyance and disturbance at vibration sensitive uses. Considering the FTA Screening Distances for Vibration Assessment (USDOT and FTA 2006), ground vibration from freight trains may result in vibration impacts at residential uses (Category 2 land uses) within 200 feet and Category 1 land uses (buildings where vibration would interfere with interior operations) within 600 feet of the rail property line. Though the majority of rail trips (from Planning Areas 3 and 4) would pass within this distance of liveaboards in the East Basin/Cerritos Channel, ground vibration would be sufficiently damped at these locations due to the effect of groundborne to waterborne vibration transfer attenuation (that is, vibration does not readily transmit from the ground through water). Given this, no sensitive land uses within the PMPU area would be impacted by operational vibration based on the FTA Screening Distances for Vibration Assessment and the thresholds indicated in Table 3.9-3. Vibration impacts resulting from rail activity along the Alameda Corridor were analyzed and mitigated according to the Alameda Corridor Project Final EIR (ACTA 1992).

Planning Areas 2 - 4

Construction

Construction of the proposed appealable/fill projects in Planning Areas 2 through 4 would likely involve a range of heavy equipment for excavating and pile driving along with associated truck and vehicle traffic. Vibration levels generated by construction equipment would vary depending on factors such as the type of equipment, the activity being performed, and the condition of the equipment. The dominant sources of vibration from construction equipment are impact pile-driving or pavement-breaking and heavy truck traffic. Sensitive receptor locations in Planning Areas 2 through 4 are more than 50 feet from construction areas. Therefore, ground vibration from pile driving or truck traffic associated with construction of the proposed appealable/fill projects and land use changes would not exceed the FTA ground-borne criterion for buildings extremely susceptible to vibration damage, as shown in Figure 3.9-1, at sensitive receptor locations in Planning Areas 2 through 4.

Operations

The dominant sources of operational vibration would likely be haul truck traffic into and out of the Port and rail movements. The only residential uses located within the PMPU which are close to rail lines are liveaboards. Ground vibration would be sufficiently damped at these locations due to the effect of groundborne to waterborne vibration transfer attenuation. Ground vibration from truck or rail traffic associated with operations of the proposed appealable/fill projects and land use changes would not exceed FTA ground-borne vibration criteria at sensitive receptor locations in Planning Areas 2 through 4.

Impact Determination

Construction

Because pile driving would be unlikely to occur closer than 50 feet from sensitive structures such as residences, institutions, and sensitive commercial activities, such as recording studios, vibration would be unlikely to exceed established thresholds and impacts would be less than significant.

Operations

Although railway vibration sources associated with the proposed Program are within 200 feet of residential communities within the PMPU (i.e., liveaboards in East Basin/Cerritos Channel), vibration levels are not expected to exceed the FTA ground-borne significance criteria due to the effect of groundborne to waterborne vibration transfer attenuation. Therefore, impacts from operations would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Residual impacts would be less than significant.

Impact NOI-4: The ambient noise level measured at the property line of affected uses would not increase by 3 dB(A) in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or any 5 dB(A) or greater noise increase, as defined by City thresholds.

The impact criterion relates only to operations, so construction impacts are not discussed in the analyses for this criterion.

Rail Yard Noise

Noise generating railroad activities include train engines coupling and uncoupling from groups of railroad cars; shuttling the cars back and forth on different tracks; and recoupling the cars to other strings of railroad cars. Noise sources include the engines, train horns, sounds associated with the slack action of strings of cars starting and stopping, and sounds of the impacts of cars being coupled together.

Maximum and average rail yard noise levels would typically range from 59 to 72 dB(A) at 100 feet (LAHD 2011) and could occasionally reach 95 dB(A) at this distance. To calculate the CNEL, a level of activity and associated noise level is assumed for each of the three time periods discussed above (6:00 A.M. to 3:00 P.M., 3:00 P.M. to 6:00 P.M., and 6:00 P.M. to 6:00 A.M.). For this analysis, it is assumed that during the busiest activity period, the hourly average noise level would be 56 dB(A) L_{eq}. A noise level of 50 dB(A) L_{eq} would occur for the 3:00 P.M. to 6:00 P.M. period and the 6:00 P.M. to 6:00 A.M. period. After adjusting the hourly average noise levels by adding 5 dB(A) to the evening period (7:00 P.M. to 10:00 P.M.) and 10 dB(A) to the average noise levels during the nighttime (10:00 P.M. to 7:00 A.M.), based on the definition of CNEL, the calculated noise level is 58 dB(A) CNEL. The baseline ambient noise level in the East Basin marinas,

which is the closest "residential" area to Port operations, based on measurements as discussed above is 61 dB(A) CNEL. When the noise level from proposed Program-related increases in rail traffic at the Pier A rail yard is added to the ambient noise level, the noise level is calculated to increase, at most, to 63 dB(A) CNEL. This would represent a 2 dB(A) increase in the CNEL and, therefore, would be below the noise increment threshold.

Railway Noise

Noise from train horns are a part of the acoustical environment in the Port region, such as associated with the at-grade crossing at Henry Ford Avenue north of the Consolidated Slip. The proposed Program would not change the level of noise from train horns, but would result in an increase in the number of times the horns are sounded. For example, there would be about 4.4 times as many intermodal train movements per day through the Henry Ford crossing (Section 3.12, Transportation and Circulation). The significance threshold is based on increased noise above the baseline level in terms of the CNEL noise metric, and is a function of the level, duration, and time of day the noise occurs, as well as the existing noise level. There are currently about 6.6 train movements per day through this crossing distributed throughout the day and night (Section 3.12, Transportation and Circulation). The proposed Program is estimated to generate 28.9 train movements throughout the day and night. This increase is calculated to result in up to a stand-alone increase of 6 dB(A) CNEL in rail related noise at this crossing and along the rail lines leading out of the Port (from 56 to 62 dB). However, because the dB scale is logarithmic, noise levels are dominated by the loudest sources (that is, the contribution of a much lower noise level to overall noise is small). As demonstrated in Table 3.9-7, existing ambient noise levels are already high in the vicinity of the rail crossing. Therefore, considering the existing ambient CNEL noise environment in the vicinity of the Henry Ford crossing area, which currently is dominated by existing roadway traffic and, to lesser extent, rail noise sources, the contribution of increased rail operations to the increase in the overall CNEL in this area would be less than 3 dB(A) CNEL. The analysis for the Henry Ford crossing would be indicative of noise impacts resulting from train movements in and out of Terminal Island on liveaboards within the East Basin/Cerritos Channel marinas.

Noise impacts resulting from rail activity along the Alameda Corridor were analyzed and mitigated according to the Alameda Corridor Project Final EIR (ACTA 1992).

Table 3.9-7. Train Movement Noise Impacts in the Vicinity of Henry Ford Grade Crossing

Location	*Description*	*Existing CNEL dB(A)*	*Future Train Noise*	*CNEL dB(A) w/ Project trains*	*CNEL Increase*	*Significant?*
SCIG N20	East Basin, Leeward Bay Marina	80.3	62.6	80.4	0.1	No
SCIG N21	East Basin, Island Yacht Marina	79.3	62.6	79.4	0.1	No
SCIG N29	1720 Mauretania St.	71.2	62.6	71.7	0.5	No

Note: SCIG = Southern California International Gateway
Source: LAHD 2011

Cargo Terminals

The main operational noise sources associated with the proposed appealable/fill projects and land use changes would include intermittent sounds associated with loading and unloading at marine terminals, movement of ocean going and support vessels, movement of vehicles (primarily trucks) entering and exiting various terminals and commercial locations within the planning area, and rail traffic. These noise sources are common within the Port, and the operation of the proposed appealable/fill projects and land use changes in Planning Areas 2 through 4 would not result in noise levels exceeding the noise increment threshold.

Planning Areas 2 - 4

Operations

Rail yard noise sources associated with the proposed Program, when added to the ambient noise level, are expected to result in maximum noise levels of 63 dB(A) CNEL at the closest "residential" area – the East Basin/Cerritos Channel marinas. This would represent a 2 dB(A) increase in the CNEL and, therefore, would be below the noise increment threshold.

The proposed Program would result in up to a stand-alone increase of 6 dB(A) in rail related noise at the Henry Ford Avenue at-grade crossing and along the rail lines leading out of the Port (from 56 to 62 dB). This would not be indicative of noise impacts resulting from train movements in and out of Terminal Island on liveaboards within the East Basin/Cerritos Channel marinas because the dominant traffic noise sources are louder. Existing ambient noise levels are already high in the vicinity of the rail crossing, and the contribution of increased rail operations associated with the proposed Program to the overall CNEL in this area would be less than 3 dB(A) CNEL, which would be below the noise increment threshold.

Similarly, noise from cargo terminal operations associated with the proposed appealable/fill projects and land use changes in Planning Areas 2 through 4 would not exceed the noise increment threshold.

Impact Determination

Operations

Noise impacts from rail and other transportation sources would be less than the noise increment threshold of 3 dB(A) CNEL at the property line of affected uses and, therefore, would be less than significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Residual impacts would be less than significant.

3.9.5 Summary Impact Determination

Table 3.9-8 summarizes the impact determinations of the proposed Program related to noise. Identified potential impacts are based on federal, state, and City of Los Angeles significance criteria, LAHD criteria, and the scientific judgment of the report preparers.

For each type of potential impact, the table describes the impact, notes the impact determination, describes any applicable mitigation measures, and notes the residual impacts (i.e., the impact remaining after mitigation). All impacts, whether significant or not, are included in the table.

Table 3.9-8. Summary Matrix of Potential Impacts and Mitigation Measures for Noise Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impacts after Mitigation*
Construction			
NOI-1: Daytime construction activities lasting more than 10 days in a 3-month period would exceed existing ambient exterior noise levels by 5 dB(A) or more at a noise-sensitive use.	Significant	**MM NOI-1: Construction Hours**. Construction shall be limited to the hours of 7:00 A.M. to 6:00 P.M. on weekdays, between 8:00 A.M. and 6:00 P.M. on Saturdays, and construction equipment noise shall be prohibited anytime on Sundays and holidays. **MM NOI-2: Construction Days**. Noise-generating construction activities shall not be conducted on weekends or holidays. **MM NOI-3: Construction Equipment**. All construction equipment powered by internal combustion engines shall be properly muffled and maintained. **MM NOI-4: Idling Prohibitions**. Unnecessary idling of internal combustion engines near noise-sensitive areas shall be prohibited. **MM NOI-5: Equipment Location**. All stationary noise-generating construction equipment, such as air compressors and portable power generators, shall be located as far as practical from existing noise-sensitive land uses. **MM NOI-6: Notification**. Residents adjacent to the proposed Program sites would be notified, in writing, of the construction schedule. **MM NOI-7: Use Quiet Equipment**. Contractors shall utilize the quietest equipment available, and all internal combustion powered equipment shall be equipped with properly operating mufflers and kept in tune to avoid backfires. In	Significant and unavoidable

Table 3.9-8. Summary Matrix of Potential Impacts and Mitigation Measures for Noise Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impacts after Mitigation*
		addition, if exposed, engines shall be fitted with protective shrouds to reduce motor noise. **MM NOI-8: Use Electrical Power when feasible**. If ample local grid power is available, electricity shall be obtained from the local power grid to avoid the use of portable generators. **MM NOI-9: Disturbance Coordinator**. A disturbance coordinator shall be designated for responding to noise complaints, with his/her name and telephone number to be clearly posted at the construction site. **MM NOI-10: Restricted Pile Driving Hours**. In order to reduce the potential impact during construction, pile driving activities shall be limited to between the hours of 9:00 A.M and 5:00 P.M. on Monday-Friday and 10:00 A.M. to 4:00 P.M. Saturday. **MM NOI-11: Temporary Noise Barriers**. Erect temporary noise attenuation barriers adjacent to stationary construction equipment directly between the equipment and sensitive receptors, Where Necessary and Feasible. Construction equipment that is stationary for extended periods (e.g., compressors, generators, etc.) shall be shielded, if appropriate, by erecting temporary noise attenuation barriers. The need for and feasibility of noise attenuation barriers shall be evaluated on a case-by-case basis considering the distance to noise-sensitive receptors, the available space at the construction location, and taking account of safety and operational considerations. Noise attenuation barriers suitable for pile driving equipment shall be considered using the same criteria. If used, the barriers shall be installed directly between the equipment and the nearest noise-sensitive use to the construction site.	
NOI-2: Construction activities that would not exceed the ambient noise level by 5 dB(A) at a noise-sensitive use between the hours of 9:00 P.M. and 7:00 A.M. Monday through	No impact	No mitigation is required	No impact

Table 3.9-8. Summary Matrix of Potential Impacts and Mitigation Measures for Noise Associated with the Proposed Program

Environmental Impacts	*Impact Determination*	*Mitigation Measures*	*Impacts after Mitigation*
Friday, before 8:00 A.M. or after 6:00 P.M. on Saturday, or at any time on Sunday.			
NOI-3: Construction would not expose persons to or generate excessive groundborne vibration or groundborne noise levels.	Less than significant	No mitigation is required	Less than significant
NOI-4: The ambient noise level measured at the property line of affected uses would not increase by 3 dB(A) in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or any 5 dB(A) or greater noise increase, as defined by City thresholds.	No impact	No mitigation is required	No impact
Operations			
NOI-1: Daytime construction activities lasting more than 10 days in a 3-month period would exceed existing ambient exterior noise levels by 5 dB(A) or more at a noise-sensitive use.	No impact	No mitigation is required	No impact
NOI-2: Construction activities that would not exceed the ambient noise level by 5 dB(A) at a noise-sensitive use between the hours of 9:00 P.M. and 7:00 A.M. Monday through Friday, before 8:00 A.M. or after 6:00 P.M. on Saturday, or at any time on Sunday.	No impact	No mitigation is required	No impact
NOI-3: Operation would not expose persons to or generate excessive groundborne vibration or groundborne noise levels.	Less than significant	No mitigation is required	Less than significant
NOI-4: The ambient noise level measured at the property line of affected uses would not increase by 3 dB(A) in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or any 5 dB(A) or greater noise increase, as defined by City thresholds.	Less than significant	No mitigation is required	Less than significant

3.9.6 Significant Unavoidable Impacts

The above mitigation measures are not anticipated to reduce residual construction impacts under Impact NOI-1 related to general construction within 400 feet and pile driving within 1,650 feet of sensitive receptors to less than significant levels in all cases. Therefore, construction noise impacts within 400 feet of sensitive receptors and pile driving within 1,650 feet would be significant and unavoidable. While noise attenuation measures may be applicable and are likely to reduce sound levels from construction, functional constraints and uncertainties regarding the effectiveness of available measures or the availability of equipment with lower noise emissions may limit the effectiveness of mitigation. Therefore, some impacts could not be reduced to less than significant levels. In addition, even with noise attenuation devices, the noise of pile driving, if it occurs within 1,650 feet of sensitive receptors, would be audible and may be perceived as intrusive or annoying by some individuals. While residual impacts of construction or pile driving are considered potentially significant and unavoidable, the finite schedule of construction activities limits the time over which sensitive receptors would be exposed to construction noise. Noise impacts associated with all other criteria (NOI-2 and NOI-4), and operational impacts associated with groundborne vibration (NOI-3), would be less than significant.

This page left intentionally blank.