4.10 NOISE

The environmental setting, regulatory framework, potential impacts, and mitigation measures concerning noise are discussed in 2016 PEIR Section 4.10.1 and hereby incorporated by reference. The additions/changes to those analyses necessary to make the 2016 PEIR applicable to the revised Project are presented below.

The section identifies the existing environmental conditions in the affected area, identifies and analyzes the Project's potential noise impacts, and recommends measures to avoid/reduce the construction and operational potentially significant impacts.

4.10.1 EXISTING ENVIRONMENTAL SETTING

2016 PEIR

The existing environmental setting concerning noise discussed in 2016 PEIR Section 4.10.1 (page 4.10-1). Ambient noise levels were measured throughout the City to characterize the variability of noise throughout the Project area. Because the City is largely developed and no significant new development has occurred since the noise measurements, no appreciable change in the area's noise environment has occurred, since the 2016 PEIR was prepared. Therefore, the existing environmental setting concerning noise discussed in 2016 PEIR applies to the revised Project and no additions/changes are necessary.

ADDITIONS/CHANGES SINCE 2016 PEIR

No additions/changes are necessary.

4.10.2 REGULATORY FRAMEWORK

2016 PEIR

The regulatory framework concerning noise, which is discussed in 2016 PEIR Section 4.10.2 (page 4.10-6), applies to the revised Project and no additions/changes are necessary.

ADDITIONS/CHANGES SINCE 2016 PEIR

No additions/changes are necessary. For reference, Encinitas General Plan (EGP) goals and policies and Encinitas Municipal Code (EMC) containing relevant noise standards are provided below.

Encinitas General Plan

Goal 1: Provide an acceptable noise environment for existing and future residents of the City of Encinitas.

Policy 1.1: Review actions or projects that may have noise generation potential to determine what impact they may have on existing land uses. If a project would cause an increase in traffic noise levels, the policy of the City of Encinitas is to accept an increase up to an Ldn of 55 dB in outdoor residential use areas without mitigation. If a project would increase the traffic noise level by more than 5 dB and the resulting Ldn would be over 55 dB, then mitigation measures must be evaluated. If the project, or action, would increase traffic noise levels by

3 dB or more and the resulting Ldn would exceed 60 dB ln outdoor use areas in residential development, noise mitigation must be similarly evaluated.

The impact of non-transportation projects must generally be evaluated on a case-by-case basis. The following guidelines will aid in evaluating the impacts of commercial and industrial projects.

Policy 1.2: An Ldn of 60 dB is the maximum acceptable outdoor noise level in residential outdoor use areas. The City recognizes that there are residential areas in which existing noise levels exceed an acceptable level. The City will adopt a Noise Wall/Barrier Installation Policy for determining which areas should receive sound walls along the major street system and to evaluate possible cost participation programs for constructing these soundwalls.

Encinitas Municipal Code

The EMC Sections containing relevant noise standards are: EMC § 9.32.410, *Construction Equipment*; and EMC § 30.40.010, *Purpose*.

4.10.3 SIGNIFICANCE DETERMINATION THRESHOLDS

Consistent with the 2016 PEIR and in substantial conformance with State CEQA Guidelines Appendix G, impacts related to noise would be significant if the Project would:

- Result in a substantial permanent increase in ambient traffic noise levels in the project vicinity above levels existing without the project (see Issue 1);
- Result in exposure of persons to or generation of noise levels in excess of limits established in the noise ordinance (see Issue 2);
- Result in a substantial temporary or periodic increase in ambient noise levels above levels existing without the project (see Issue 3); or
- Result in the generation of excessive groundborne vibration or groundborne noise levels in the project vicinity above levels existing without the project (see Issue 4).

4.10.4 IMPACTS AND MITIGATION MEASURES

4.10.4 - Issue 1: Ambient Noise Levels
Would the project result in a substantial permanent increase in ambient traffic noise levels in the project vicinity above levels existing without the project?

IMPACTS:

2016 PEIR

The potential impacts concerning noise/ambient noise levels are discussed in 2016 PEIR Section 4.10.5 (Issue 1, page 4.10-14). The 2016 PEIR concluded that future housing development would not directly or indirectly conflict with the City's noise-related policies or regulations. The 2016 PEIR also concluded that future buildout of the housing sites would increase traffic compared to existing conditions. Given the City's largely developed nature, buildout of an individual housing site alone was determined to not likely double the traffic volume on a roadway. Traffic volumes were modeled on a strategy-wide basis. Further,

increases in existing ambient noise levels would occur regardless of project buildout due to on-going regional growth. Impacts were assessed by comparing future noise levels with and without implementation of each of the three housing strategies. The analysis concluded that compared to the no project condition, the increases in ambient noise associated with the three housing strategies would be less than 3 dB adjacent to all study roadway segments. The 2016 PEIR concluded impacts would be less than significant and no mitigation was required.

The additions/changes necessary to make the 2016 PEIR applicable to the revised Project are presented below.

REVISED PROJECT

As previously noted, the 2016 PEIR assessed ambient traffic noise impacts for the three housing strategies, including Housing Strategy 3 (MMUP) which involved the greatest maximum realistic yield (MRY) and would generate the greatest traffic volumes; see 2016 PEIR Table 4.10-9. Table 4.2-4, *Maximum Realistic Yield & Trip Generation Comparison*, compares the proposed Project's MRY and trip generation to the MMUP strategy's MRY and trip generation. As compared to the MMUP strategy's MRY, the Project's MRY represents a net decrease of 767 dwelling units (DU) (-24 percent DU) and a net decrease of 1,610,066 SF of non-residential uses (-100 percent SF). As also shown in Table 4.2-4, as compared to the MMUP strategy's trip generation, the proposed Project would result in a 50.4 percent trip reduction. Since the 2016 PEIR concluded that MMUP would result in a less than significant impact concerning ambient traffic noise, and the proposed Project's MRY and trip generation are significantly less than the MMUP strategy, it can be deduced that the proposed Project's increase in ambient noise levels due to mobile noise sources would be below the MMUP levels. Therefore, the Project would not increase ambient traffic noise levels such that the City's standards would be exceeded and a less than significant impact would occur in this regard. As concluded in the 2016 PEIR, the future increases in existing ambient noise levels would occur with or without the HEU, due to the anticipated increase in regional growth. Therefore, the Project would not result in a substantial permanent increase in ambient traffic noise levels in the Project vicinity above existing levels, and a less than significant impact would occur in this regard. Refer to Figure 4.10-1, *Future Vehicle Traffic Noise Contours*.

GENERAL PLAN POLICIES AND MITIGATION MEASURES:

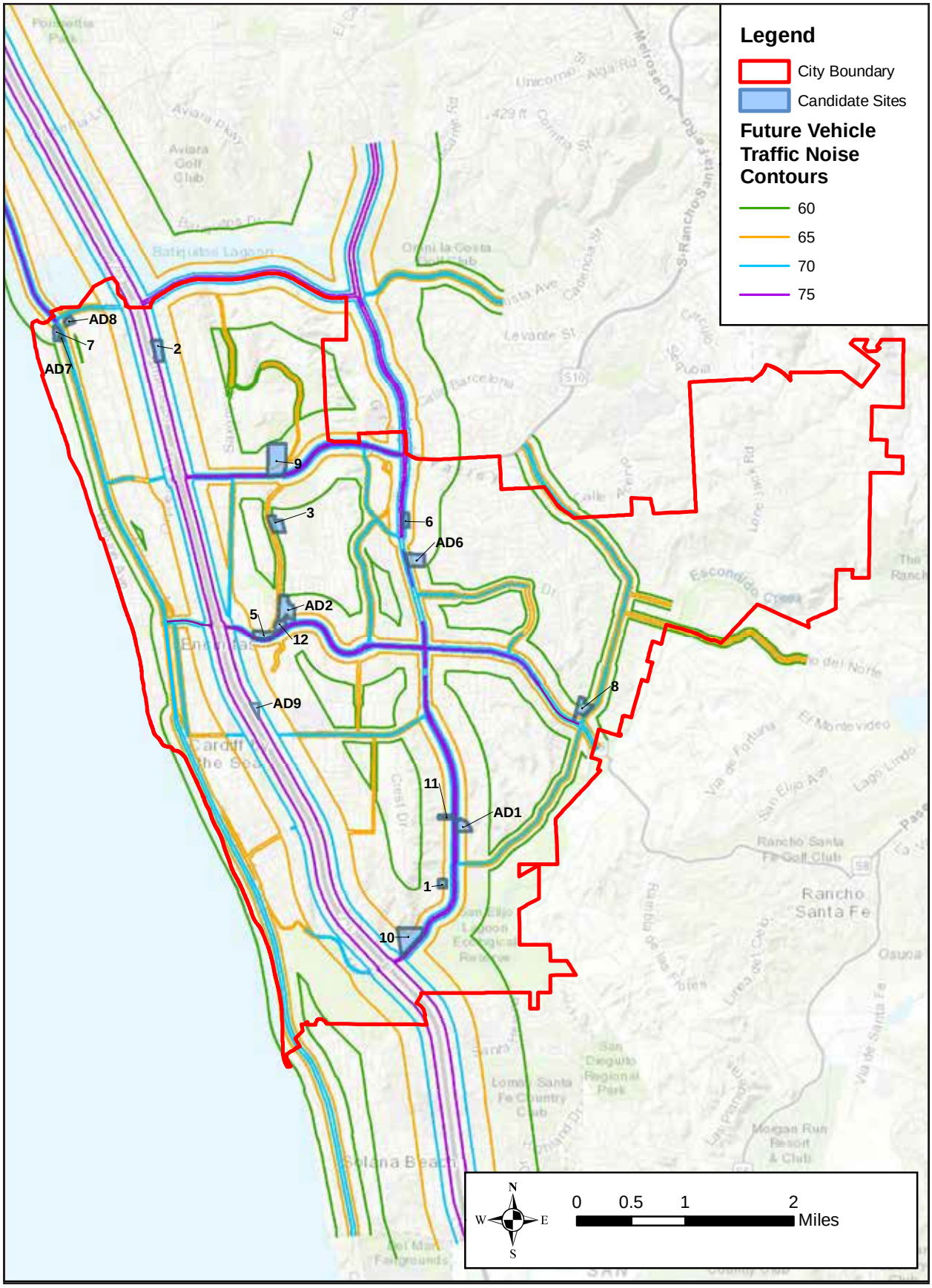
GENERAL PLAN POLICIES:

- NE Policy 1.1
- NE Policy 1.2
- NE Policy 1.4
- NE Policy 1.7
- NE Policy 1.8
- NE Policy 3.1
- NE Policy 4.1

MITIGATION MEASURES:

No mitigation measures concerning noise/ambient noise levels were identified in 2016 PEIR Section 4.10.5 and none are necessary for the revised Project.

LEVEL OF SIGNIFICANCE: Less than Significant Impact



Source: City of Encinitas, GIS.

4.10.4 - Issue 2: On-Site Generated Noise
Would the project result in exposure of persons to or generation of noise levels in excess of limits established in the noise ordinance?

4.10.4 - Issue 3: Temporary Noise
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?

IMPACTS:

2016 PEIR

The potential impacts concerning temporary noise/on-site generated noise are discussed in 2016 PEIR Section 4.10.6 (Issue 2, page 4.10-39). A significant impact would occur if future development would exceed the property line noise limits established in the City's Noise Abatement and Control Ordinance (EMC § 9.32). Noise sources associated with future development include typical residential activities (i.e., vehicles arriving and leaving, children at play and landscape maintenance machinery). The 2016 PEIR concluded that none of these noise sources would violate EMC standards or result in a substantial permanent increase in existing noise levels.

The 2016 PEIR concluded that heating, ventilation, and air conditioning (HVAC) equipment with exterior fans or condensers mounted on the ground or roofs have the potential to produce noise levels in excess of the City's limits. Commercial and retail components of mixed-use developments would also generate noise from commercial-related mechanical equipment, loading docks, deliveries, trash-hauling activities and customer and employee use of commercial facilities. The analysis concluded that future onsite generated noise sources have the potential to exceed the property line noise level limits established in the City's Noise Abatement and Control Ordinance. Therefore, impacts were considered significant. The 2016 PEIR concluded that implementation of Mitigation Measure NOS-1, which requires that residential development proposed adjacent to commercial uses be subject to a site-specific noise study prior to the issuance of any permit, would reduce impacts to a less than significant level.

The additions/changes necessary to make the 2016 PEIR applicable to the revised Project are presented below.

REVISED PROJECT

Approximately 7 dwelling units (DU) and approximately 793,757 square feet (SF) of non-residential land uses are located on the candidate sites. These existing land uses would be replaced by future residential development.

Short-Term Construction

Construction activities have a short and temporary duration, lasting from a few days to a period of several months. For analysis purposes, the construction period associated with each future development is assumed to be 12 months, which is considered a reasonable/typical duration based on the candidate sites' sizes and development potential (between 8 and 296 DU). Ground-borne noise and other types of construction-related noise impacts would typically occur during the initial site preparation, which can create the highest noise levels. Generally, site preparation has the shortest duration of all construction phases. Activities that occur during this phase include earthmoving and soils compaction. High ground-borne noise levels and other miscellaneous noise levels can be created by heavy-duty truck, backhoe, and

other heavy-duty construction equipment operations. Noise from construction activities is generated by two primary sources: (1) the noise related to active construction equipment; and, (2) the transport of workers and equipment to construction sites. These noise sources can be a nuisance to residents, businesses, and sensitive noise receptors (i.e., residential, hospital, hotel/motel, schools, parks, and places of worship). The Federal Transit Administration (FTA) has compiled data regarding noise generating characteristics of specific types of construction equipment and typical construction activities. These data are presented in Table 4.10-1, *Construction Equipment Noise Emission Levels*. Noise levels decrease rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling distance.

TABLE 4.10-1: CONSTRUCTION EQUIPMENT NOISE EMISSION LEVELS

Type of Equipment	Acoustical Use Factor[1]	L_{max} at 50 Feet (dBA)
Crane	16	81
Dozer	40	82
Excavator	40	81
Generator	50	81
Grader	40	85
Other Equipment (greater than five horse power)	50	85
Paver	50	77
Pile Driver (impact)	20	101
Pile Driver (sonic)	20	96
Roller	20	80
Tractor	40	84
Truck	40	80
Welder	40	73

NOTE:
1. Acoustical use factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

Source: Federal Highway Administration, Roadway Construction Noise Model (FHWA-HEP-05-054), January 2006.

Operating cycles for these types of construction equipment used may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Construction activities associated with future development accommodated through Project implementation would occur in incremental phases over time based on market demand, economic, and planning considerations. All construction activities associated with future development would be subject to compliance with EGP policies and the Noise Abatement and Control Ordinance (EMC § 9.32).

The Noise Abatement and Control Ordinance limits the operation of construction equipment to Mondays through Saturdays between the hours of 7:00 a.m. and 7:00 p.m. EMC § 9.32 limits construction noise at a residential property line to a sustained level of 75 dB for no more than eight hours during a 24-hour period. Construction activity is required to comply with these limits. Typical residential construction activities are subject to limited duty cycles having intermittent durations. In addition, heavy construction equipment is not typically stationary and moves throughout a development site. Future development would be subject to compliance with EMC § 9.32. For these reasons, construction activity associated with

future development would avoid significant construction noise effects. A less than significant impact would occur in this regard.

LONG-TERM OPERATIONS

Future developments' stationary noise sources (e.g., HVAC equipment with exterior fans or condensers mounted on the ground or roofs) could generate noise levels exceeding Noise Abatement and Control Ordinance limits. Additionally, where future development is proposed adjacent to a non-residential land use, future development could be exposed to noise levels exceeding Noise Abatement and Control Ordinance limits. However, all future development would be subject to compliance with EMC Chapter 30.40, which establishes performance standards to minimize the adverse impacts of certain nuisance factors and provides methods of determining compatibility between uses of land and buildings. The Noise Abatement and Control Ordinance requires that every use be operated such that generated noise does not exceed established levels at or beyond the lot line and does not exceed the limits of any adjacent zone. Following compliance with the Noise Abatement and Control Ordinance, the Project would result in a less than significant impact concerning exposure of persons to or generation of noise levels that exceed Noise Abatement and Control Ordinance limits.

GENERAL PLAN POLICIES AND MITIGATION MEASURES:

GENERAL PLAN POLICIES:

- NE Policy 1.1
- NE Policy 1.2
- NE Policy 1.3
- NE Policy 1.4
- NE Policy 1.7
- NE Policy 1.8
- NE Policy 2.1
- NE Policy 3.1
- NE Policy 4.1

MITIGATION MEASURES: No mitigation is required.

LEVEL OF SIGNIFICANCE: Less Than Significant Impact

4.10.4 - Issue 4: Groundborne Noise and Vibration
Would the project result in the generation of excessive groundborne vibration or groundborne noise levels in the project vicinity above levels existing without the project?

IMPACTS:

2016 PEIR

The potential impacts concerning groundborne vibration are discussed in 2016 PEIR Section 4.10.8 (Issue 4, page 4.10-50). The analysis focused on vibration impacts during construction activities, which included demolition of existing structures, site preparation work, excavation of parking and subfloors, foundation work, and building construction. Typical construction techniques were assumed and no blasting was contemplated. Other heavy-duty construction equipment would generate a limited amount of ground borne vibration during construction activities, but would be limited to a few hours each day. Jack hammers and other high-power tools used for foundation work would also be limited for short periods of time for each individual project. The 2016 PEIR assumed no tools capable of generating ground borne vibration would be used during operational buildout, therefore operational vibration impacts were concluded to be less than significant. The 2016 PEIR analysis concluded a less than significant impact

concerning ground borne vibration impacts. The additions/changes necessary to make the 2016 PEIR applicable to the revised Project are presented below.

ADDITIONS/CHANGES SINCE 2016 PEIR

Short-Term Construction

Removal of existing uses and construction of additional residential uses would generate short-term vibration impacts. Typical construction techniques are assumed, and no blasting or pile-driving is contemplated. Construction activities can generate varying degrees of groundborne vibration, depending on the construction procedure and equipment used. Construction equipment operations would generate vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located near a construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). Groundborne vibrations from construction activities rarely reach levels that damage structures.

Table 4.10-2, *Typical Vibration Levels for Construction Equipment*, identifies vibration velocity levels for various construction equipment types published by the Federal Transit Administration (FTA). The architectural damage criterion for continuous vibrations (i.e., 0.2 inch/second) is generally considered conservative, including for sustained pile driving.

TABLE 4.10-2: TYPICIAL VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Approximate Peak Particle Velocity At 25 Feet (Inches/Second)	Approximately Peak Particle Velocity At 50 Feet (Inches/Second)
Large bulldozer	0.089	0.031
Loaded trucks	0.076	0.027
Small bulldozer	0.003	0.001
Auger/drill rigs	0.089	0.031
Jackhammer	0.035	0.012
Pile driver	0.644	0.228
Vibratory hammer	0.035	0.012
Vibratory compactor/roller	0.003	0.001

Notes:
1. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006. Table 12-2.
2. Calculated using the following formula:
   $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$
   where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
   PPV (ref) = the reference vibration level in in/sec from FTA *Transit Noise and Vibration Impact Assessment Guidelines,* Table 12-2.
   D = the distance from the equipment to the receiver

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006.

The types of construction vibration impacts include human annoyance, which occurs when construction vibration rises significantly above the threshold of human perception for extended periods, and building damage, which can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 25 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction

equipment. Construction activities associated with future development have the potential to generate low levels of groundborne vibration.

As with noise, groundborne vibration attenuates with distance. Construction-related groundborne vibration would primarily impact vibration sensitive land uses (i.e., non-engineered timber and masonry buildings) located adjacent to or near a construction site. The force of vibrations reaching an adjacent structure would depend upon the variables described above. Assuming the vibration velocity levels provided in Table 4.10-2, vibration velocities from typical heavy construction equipment operations, as are anticipated with the proposed Project, would range from 0.003 to 0.089 inch-per-second PPV at 25 feet from the activity source. Vibration velocities from typical heavy construction equipment operations at 25 feet from the activity source would not exceed the 0.2 the inch/second threshold. Therefore, Project construction activities would not generate excessive groundborne vibration and a less than significant impact would occur in this regard.

LONG-TERM OPERATIONS

No changes are necessary to make the 2016 PEIR applicable to the proposed Project. No tools capable of generating ground borne vibration would be used during future developments' operations. Therefore, Project operations would not generate excessive groundborne vibration and a less than significant impact would occur in this regard.

GENERAL PLAN POLICIES AND MITIGATION MEASURES:

GENERAL PLAN POLICIES:

- NE Policy 1.1
- NE Policy 1.2
- NE Policy 1.8

MITIGATION MEASURES:

No mitigation measures concerning noise/ground borne noise and vibration were identified in 2016 PEIR Section 4.10.8 and none are necessary for the revised Project.

LEVEL OF SIGNIFICANCE: Less than Significant Impact

4.10.5 SIGNIFICANT UNAVOIDABLE IMPACTS

No significant unavoidable impacts concerning noise have been identified following compliance with the established regulatory framework.

4.10.6 SOURCES CITED

Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006.
Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Guidelines*, May 2006.