

## 4.9 NOISE

This section describes the existing ambient noise environment, including the sources of noise in the area of the proposed project and the location of noise-sensitive land uses. The relevant local noise standards and guidelines are described. The potential project-related noise sources including construction activity are discussed. The changes in estimated noise levels due to the proposed project are compared to guidelines contained in local and state planning and regulatory documents to determine the significance of the changes.

One comment about noise was received during the public scoping period. The commenter requested that the noise effect to the surrounding area from construction and operation of the proposed desalination plant be analyzed.

### 4.9.1 Environmental Setting

#### 4.9.1.1 *Fundamental Concepts of Environmental Acoustics*

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher-pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, several noise measurement scales are used to describe noise in a particular location. The *decibel (dB)* is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a tenfold increase in acoustic energy, while 20 decibels is 100 times more intense, and 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as an approximate doubling of loudness over a fairly wide range of intensities. Technical terms are defined in **Table 4.9-1**.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level* or *dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in **Table 4.9-2**.

Because sound levels can vary over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. 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  $L_{eq}$ . The most common averaging period is hourly, but  $L_{eq}$  can describe any series of noise events of arbitrary duration.

**Table 4.9-1  
Definitions of Acoustical Terms**

Term	Definitions
Decibel (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, which is 20 micropascals (20 micronewtons per square meter).
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels 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 reactions to noise. All sound levels in this report are A-weighted.
L01, L10, L50, L90	The A-weighted noise levels that are exceeded 1 percent, 10 percent, 50 percent, and 90 percent of the time during the measurement period.
Equivalent Noise Level ( $L_{eq}$ )	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level ( $L_{dn}$ )	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
$L_{max}$ , $L_{min}$	The maximum and minimum A-weighted noise level during the measurement period.
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	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

**Table 4.9-2  
Typical Sound Levels Measured in the Environment and Industry**

At a Given Distance From Noise Source (feet)	A-Weighted Sound Level (Decibels)	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100)	130		
Jet Takeoff (200)	120		Pain Threshold
	110	Rock Music Concert	
Pile Driver (50)	100		Very Loud
Ambulance Siren (100)			
	90	Boiler Room	
Freight Cars (50)		Printing Press Plant	
Pneumatic Drill (50)	80	In Kitchen With Garbage Disposal Running	
Freeway (100)			
	70		Moderately Loud
Vacuum Cleaner (10)	60	Data Processing Center	
		Department Store	
Light Traffic (100)	50	Private Business Office	
Large Transformer (200)			
	40		Quiet
Soft Whisper (5)	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance of the receptor from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night – because excessive noise interferes with the ability to sleep – 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (CNEL) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. to 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. The *Day/Night Average Sound Level* ( $L_{dn}$ ) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

## 4.9 NOISE

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### 4.9.1.2 Existing Noise Environment

A site visit was conducted on May 6, 2004, to identify noise-sensitive receivers in the vicinity of project facilities that would create noise during operation and to measure noise levels at the proposed desalination plant site. The major noise source at the proposed desalination plant site is traffic noise generated along Interstate 580 and local roadways. Other noise sources include commercial activities and boats. Commercial and light industrial uses border the site to the north, west, and south; San Rafael Bay is east of the site. At the time of the site visit, construction noise from grading of a site across the street was audible. Typical ambient daytime noise levels (without construction noise) at the proposed desalination site were measured to be approximately 45 to 50 dBA.

The major noise source in the vicinity of both the Larkspur Landing and Jacoby pumping stations is traffic along US 101. The Jacoby Street Pumping Station is also located near the Marin Resource Recovery Center, which includes noise generated by a solid waste recycling plant, a garbage disposal plant, and waste haul traffic.

Noise would result from the construction of the facilities mentioned above as well as the pipelines associated with the proposed project. These facilities and their locations are described in Section 3.

### 4.9.1.3 Regulatory Background

The proposed project includes elements located at several sites in southern and central Marin County. The desalination plant, and the Jacoby Street Pumping Station, the San Quentin Ridge tanks and Reaches 1 and 3 of the pipeline would be located in the City of San Rafael, and the Larkspur Landing Pumping Station would be in the City of Larkspur. Reach 2 of the pipeline passes through the Town of Corte Madera, and the Ridgecrest A tank site would be in open space land owned by the Town of Tiburon. Alternate tank sites and pipeline routes (see Section 6.3.7) would traverse the City of Mill Valley. These jurisdictions and Marin County have established regulations, plans, and policies designed to limit noise exposure at noise-sensitive land uses, as described below. Noise standards set forth in Appendix G of the CEQA Guidelines are presented in Section 4.9.2.1.

### Marin County

~~Section VI of the Noise Element~~The noise section of the 1994-2007 Marin Countywide Plan (Section 3.10 of the Built Environment Element) contains policies and programs to maintain appropriate noise levels and protect noise-sensitive land uses such as residences and schools from excessive noise. The plan establishes noise limits of 65 dBA for commercial areas and 70 dBA for industrial areas. In addition, the following subpart of Objective N-2 (“Prevent Significant Noise Impacts from New Development in Existing Developed Areas”) would apply to the proposed project:

~~Program N-2.4a Limit Construction Hours. The Community Development Agency reserves the right to set hours for construction-related activities involving the use of machinery, power tools or hammering. The type of construction, site location and noise sensitivity of nearby land uses will determine the hours of construction. The conditions of approval will specify hours for staging and type of construction activities. Special consideration shall be given to homeowners who perform their own work.~~

~~The 2007 Draft Marin Countywide Plan, which may be adopted in November 2007 and would supersede the 1994 plan, applies slightly different noise benchmarks for new development. The plan describes noise levels of up to 70 dB CNEL for business/commercial areas and 75 dB CNEL for industrial/utilities areas as ‘normally acceptable.’ In addition, the following implementing program would apply to the proposed project:~~

~~NO-1.i Regulate Noise Sources. Sections 6.70.030(5) and 6.70.040 of the Marin County Code establish allowable hours of operation for construction-related activities. As a condition of permit approval for projects generating significant construction noise impacts during the construction phase, construction management for any project shall develop a construction noise reduction plan and designate a disturbance coordinator at the construction site to implement the provisions of the plan.~~

Section 6.70.030(5) of the Marin County Code limits hours of construction activities to 7 a.m. to 6 p.m. Monday through Friday and 9 a.m. to 5 p.m. on Saturday. Construction is prohibited on Sundays and holidays. According to Section 6.70.030(5), loud noise-generating construction-related equipment (e.g., backhoes, generators, and jackhammers) can only be operated from 8 a.m. to 5 p.m. on Monday through Friday at construction sites for permits administered by the Community Development Agency. Special exceptions to these limitations may occur for construction projects of city, county, state agencies; other public agency; or a public utility.

### City of San Rafael

The Noise Element of the San Rafael General Plan guides development of land uses to be compatible with the noise environment. This element establishes noise and land use compatibility guidelines for proposed land uses and sets goals to minimize noise throughout the community.

Exhibit 31 of the San Rafael General Plan establishes Land Use Compatibility Standards for New Development as a guide for evaluating noise impacts. In industrial and agricultural areas, the land use is considered ‘normally acceptable’ if the noise levels are below 70 dBA  $L_{dn}$ . In office and commercial uses, the land use is considered ‘normally acceptable’ if the noise levels are below 65 dBA  $L_{dn}$ . The following subpart of General Plan Policy N-4 applies to the proposed project:

**b. Performance Standards for Uses Affecting Nonresidential and Mixed Use Districts.** New nonresidential projects shall not increase noise levels in a nonresidential or mixed-use district by more than  $L_{dn}$  5 dB, or create noise impacts that would increase noise levels to more than  $L_{dn}$  65 dB (Office, Retail) or  $L_{dn}$  70 dB (Industrial), at the property line of the noise receiving use, whichever is the more restrictive standard.

The following City of San Rafael noise ordinances would also apply to the proposed project:

**8.13.050 Standard Exceptions to General Noise Limits:** On any construction project on property within the city, construction, alteration, demolition, maintenance of construction equipment, deliveries of materials or equipment, or repair activities otherwise allowable under applicable law will be allowed between the hours of 7 a.m. and 6 p.m. Monday through Friday, and 9 a.m. and 6 p.m. on Saturdays, provided that the noise level at any point outside of the property plane of the project will not exceed 90 dBA. All such activities will be precluded on Sundays and holidays.

## 4.9 NOISE

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For any construction project involving the construction of one or more new buildings or residences within the city, or when required by the planning commission or city council as part of their development review for the property, the property owner or occupant will post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, material men and all other persons at the construction site, of the basic requirements of this chapter.

- Said sign(s) will be posted in a conspicuous place visible from the public ROW near the entrance to the job site, at least 5 feet above ground level, and will be of a white background, with legible black lettering, which lettering will be a minimum of one and one-half inches in height.
- Said sign will read as follows (or as consistent with other hours approved by the planning commission or city council):

<b>Construction Hours</b>	<b>(includes any and all deliveries)</b>
Monday–Friday	7:00 a.m. to 6:00 p.m.
Saturday	9:00 a.m. to 6:00 p.m.
Sunday/Holidays	Prohibited

**8.13.060 Exceptions Allowed with Permit:** In addition to the standard exceptions permitted pursuant to Section 8.13.050 of this chapter, the Director of Community Development or his designee may grant a permit allowing an exception from any or all provisions of this chapter where the applicant can show that a diligent investigation of available noise abatement techniques indicates that immediate compliance with the requirements of this chapter would be impractical or unreasonable. Any such permit will be issued with appropriate conditions to minimize the public detriment caused by the permitted exceptions. Any such permit will be of such duration as approved by the Director of Community Development or his designee, up to a maximum period of six (6) months, but will be renewable upon a showing of good cause, and will be conditioned by a schedule for compliance and details of methods therefore in appropriate cases. In the discretion of the Director of Community Development or his designee, an exception permit may be issued and reissued for successive short periods of time in order to allow monitoring of the adverse noise impacts of the excepted activity, and additional conditions may be imposed upon reissuance of the permit, if the Director of Community Development or his designee determines that such additional conditions are necessary to mitigate noise impacts from the excepted activity to a level he deems acceptable under all the circumstances.

### **City of Larkspur**

The City of Larkspur General Plan addresses noise in Chapter 7, Health and Safety, and presents Land Use Compatibility Standards in Figure 7-9. The plan describes noise levels of up to 70 dB CNEL for business/commercial areas and industrial/utilities areas as ‘normally acceptable.’

The following noise ordinance would apply to the proposed project:

**9.54.060 Exemptions:** Noise sources associated with construction, repair, remodeling, demolition, or paving of any real property, provided said activities will only occur between the hours of 7 a.m. and 6 p.m. Monday through Friday (excluding legal

holidays) and 9 a.m. and 5 p.m. Saturday, Sunday, and legal holidays. All powered construction equipment will be equipped with intake and exhaust mufflers recommended by the manufacturers thereof; pavement breakers and jackhammers will also be equipped with acoustical attenuating shields or shrouds recommended by the manufacturers thereof.

### **Town of Corte Madera**

Noise is addressed in Chapter 7 of the Town of Corte Madera General Plan. The following policy and programs apply to the proposed project:

- 7.1.e.** Minimize impact of loud trucks by requiring that maximum noise levels due to single events be controlled to 50 dB in bedrooms and 55 dB in other habitable spaces. Enforce California vehicle noise laws.
- 7.1.f.** Consider including in the noise ordinance the regulating of stationary noise sources, such as construction and property maintenance activity, and mechanical equipment.
- 7.1.g.** A project that would create an increase of five dB or more annualized CNEL beyond a right-of-way should provide mitigation necessary to maintain existing noise levels.
- 7.1.h.** Limit hours for all construction work audible beyond the boundary of the site to weekdays between 7:30 a.m. and 5:30 p.m., with the exception of holidays. Establish routes for trucks serving construction sites for projects larger than a single-family home as a condition of project approval.
- 7.1.i.** In making a determination of impact under the California Environmental Quality Act (CEQA), consider the following impacts to be “significant”:
  - A noise exposure of four or more dB if the resulting noise level would exceed that described as normally acceptable for the affected land use in *Table 8*.
  - Any increase of six dB or more, due to the potential for adverse community responses.

In addition, Section 9.36.030(a) of the Corte Madera Municipal Code Specific sets maximum noise levels for different zoning districts of the town and different times. Exceptions are listed in Section 9.36.030(c), which states:

The provisions of subsection (a) shall not apply to construction or demolition work performed during the following times: Monday through Fridays from 7 a.m. to 5 p.m.; and Saturdays and Sundays from 10 a.m. to 5 p.m.; provided, that all powered construction equipment is equipped with intake and exhaust mufflers recommended by the manufacturers thereof; and provided, further, pavement breakers and jackhammers shall also be equipped with acoustical attenuating shields or shrouds recommended by the manufacturers thereof. In lieu of or in the absence of manufacturer's recommendations, the town engineer shall have the authority to prescribe such means of accomplishing maximum noise attenuation as he deems to be in the public interest, considering the available technology and economic feasibility.

### **Town of Tiburon**

Section 7.2 of the Noise Element of the General Plan sets noise compatibility guidelines for different land use categories. In industrial areas, the land use is considered ‘normally acceptable’

## 4.9 NOISE

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if the noise levels are below 70 dBA  $L_{dn}$ . In office and commercial uses, the land use is considered 'normally acceptable' if the noise levels are below 65 dBA  $L_{dn}$ . The following noise policies would apply to the proposed project:

N-6: Hours of use of recreation and commercial facilities should be regulated to minimize offensive noise to ensure compatibility between such facilities and nearby residential areas.

N-10: Standard quiet construction methods shall be used where feasible and when construction activities take place within 500 feet of noise-sensitive areas.

Tiburon does not have a Noise Ordinance, but the Municipal Code requires waste management trucks to coordinate with the Town Planner on changes to routes and times (Municipal Code Section 26-18).

### **City of Mill Valley**

The Mill Valley General Plan includes noise standards in the Public Health and Safety Element. Guideline 2, Exterior Noise Standards, sets noise thresholds for different land uses at different times. Noise levels in commercial zones are not to exceed 65 dBA from 7 a.m. to 9 p.m. or 55 dBA from 9 p.m. to 7 a.m. The following parts of Guideline 4, Special Noise Limits, would apply to project construction:

D. Construction projects. The noise levels produced by construction projects shall not exceed 60 dBA plus the adjustments described above without issuance of a special permit. Said special permit shall not be issued by the authorized City department unless the applicant demonstrates that the equipment to be used produces noise levels that are the lowest of currently available equipment. However, no permit shall be required to perform emergency work approved by the City.

H. Noise arising from activities in recreation areas. Activity noise levels in any recreation area shall not exceed 70 dBA between 7:00 a.m. and 9:00 p.m. on any day. The limits of Table A shall apply between 9:00 p.m. and 7:00 a.m.

The Mill Valley Municipal Code establishes noise control laws in Chapter 7.16. The following would apply to the proposed project:

**7.16.080 Exemptions.** C. Noise sources associated with or vibration created by construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided such activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, or at any time on Saturday, Sunday or a legal holiday, and provided the noise level created by such activities does not exceed the noise standard of 60 dBA plus the adjustments specified in subsection B of Section 7.16.060, as measured on residential property, and any vibration created does not endanger the public health, welfare and safety. Heavy equipment and power tools are restricted to weekdays between the hours of 8 a.m. and 5 p.m. Owner/occupant builders are exempt from the time and heavy equipment and power tools restrictions on Saturdays between the hours of 9 a.m. and 5 p.m. Construction noise sources exceeding the above limits shall be allowed only upon issuance of a special permit under Subsection D of Section 7.16.090. Nothing in this Chapter shall be construed to prohibit construction activities that do not exceed the ambient noise level by more than 10 dBA, such as painting or interior work. (Ord. 899, Sec. 1 (part), September 19, 1977; Ord. 1174, Sec. 1 (part), February 5, 2001.)

**7.16.090 Special noise limits.** D. Construction projects. The noise levels produced by construction projects shall not exceed sixty (60) dBA plus the adjustments of Subsection B. of Section 7.16.060 without issuance of a special permit. The special permit shall not be issued by the authorized City department unless the applicant demonstrates that the equipment to be used produces noise levels that are the lowest of currently available equipment. Exception: No permit is required to perform emergency work. Contractors shall be required to prominently display a notice of the date of commencement of construction noise at least three days prior to actual commencement. Such notice shall be located on the construction site and shall be readable from the closest adjacent street.

## 4.9.2 Impacts and Mitigation Measures

### 4.9.2.1 Standards of Significance

CEQA includes qualitative guidelines for determining significance of adverse environmental noise impacts. A project would typically have a significant impact if it would:

- Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies;
- Expose people to or generate excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without 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 projects within an area covered by an airport land use plan or within 2 miles of a public airport or public use airport when such an airport land use plan has not been adopted, or within the vicinity of a private airstrip, expose people residing or working in the project area to excessive aircraft noise levels; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

The first, second, third, and fourth checklist items are relevant to the proposed project. There are no airports in the project's vicinity. Therefore, the fifth and sixth checklist items are not carried forward for further analysis.

For the purposes of this EIR, the project would have a significant impact with regard to noise if it would result in any of the following:

- **Noise and Land Use Compatibility:** A significant noise impact may be identified if exterior noise levels on the project site would exceed 70 dBA  $L_{dn}$ . The 70 dBA threshold reflects the land use compatibility standards for the cities of San Rafael and Larkspur (Section 4.9.1.3).
- **Substantial Permanent Increase to Noise Levels:** The impact would be considered significant if project-generated noise were to increase the noise levels at noise-sensitive receivers by 5 dBA  $L_{dn}$  or create noise impacts that would increase noise levels to more than

## 4.9 NOISE

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65 dBA  $L_{dn}$  (Office, Retail) or 70 dBA  $L_{dn}$  (Industrial) at the property line of the noise receiving use.<sup>1</sup>

- **Construction Noise:** Construction activities produce temporary noise impacts at any single location (pipeline construction would occur primarily along existing streets and the activity would move along the streets as construction progresses). Since these impacts would be short-term and vary considerably day-to-day, they are evaluated somewhat differently than operational impacts. When construction activities are predicted to generate noise levels greater than 60 dBA  $L_{eq(hr)}$ , exceed ambient noise levels by 5 dBA or more, and cause prolonged interference with normal activities in noise-sensitive areas, the impact would be considered significant.

### 4.9.2.2 *Impacts and Mitigation Measures*

**Impact 4.9-1:** The proposed project is located in a noise environment that is compatible with its use.

**Significance:** Less than significant

**Mitigation:** No mitigation required

**Discussion:**

The major noise source at the proposed desalination plant site and the pumping station sites is traffic noise. Other noise sources include commercial activities and boats. Traffic noise at the proposed desalination plant site is generated from traffic on Interstate 580 and local roadways. The major noise source in the vicinity of the pumping stations is traffic along US 101. The Jacoby Street Pumping Station site is also located near the Marin Resource Recovery Center, which includes noise generated by a solid waste recycling plant, a garbage disposal plant, and waste haul traffic. Ambient daytime noise levels at the desalination plant site are approximately 50 dBA. At the time of the site visit, construction noise was also heard at the site location (50 dBA). The project sites are generally isolated from noise sources, and noise levels at all locations would not approach the 70-dBA  $L_{dn}$  standard. Noise levels in the project area are assumed to remain similar in future years.

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**Impact 4.9-2:** Operation of the proposed desalination plant would result in an increase in noise levels surrounding the location. However, noise levels would not exceed the ‘normally acceptable’ noise level limit of 65 dBA  $L_{dn}$  for industrial noise sources adjacent to commercial use areas. Operation of the proposed project would not result in excessive groundborne vibration.

**Significance:** Less than significant

**Mitigation:** No mitigation required

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<sup>1</sup> Performance standards from the City of San Rafael General Plan 2020 reflect uses affecting nonresidential and mixed-use districts, as described in Section 4.9.1.3.

**Discussion:**

Under the San Rafael General Plan, the performance standard for mixed use districts is 65 dB  $L_{dn}$  for office and retail uses or 70 dB  $L_{dn}$  for industrial uses, measured at the property line of the noise receiving use, whichever is the more restrictive standard. In this case, both commercial and light industrial uses border the proposed desalination facility site to the north, west, and south; therefore, the more restrictive threshold of 65 dB applies.

The predicted noise levels at the facility boundary (assumed to be 50 feet from each building) are listed in **Table 4.9-3**.

**Table 4.9-3  
Predicted Pump-Generated Noise Levels**

Site Name	Noise Level at 50 feet from Building (dB)	$L_{dn}$ Noise Level at 50 feet from Building (dB)
Pelican Way Desalination Plant	39–44	45–50
Larkspur Landing Pumping Station	37–42	43–48
Jacoby Street Pumping Station	33–38	39–44

Noise levels were predicted by estimating steady-state sound pressure levels attributable to the fixed source machinery within the building housing. The building construction was assumed to be solid 6-inch concrete with interior sound absorption, insulated louvers (doors, ventilation, etc.), and typical vibration isolation mounting, so that airborne and structural paths are controlled. Noise levels outside of mechanical equipment structures are directional depending on the receiver's proximity to the acoustically weaker portions of the building (such as doors or ventilation openings). This directionality is indicated by the range of noise levels in **Table 4.9-3**. The predicted noise levels at 50 feet from the site noise sources are well below the normally acceptable noise level of 65 dBA  $L_{dn}$  for industrial noise sources adjacent to commercial use areas. Assuming the equipment is enclosed and the interior noise levels adhere to occupational health and safety requirements for exposure of workers to noise sources, noise levels would not exceed standards.

Operation of the pumps associated with the desalination facility could potentially create some groundborne vibration. However, pumps will be designed and installed in such a fashion as to minimize the vibration since this condition is not desirable from an operational standpoint since excessive vibration can cause damage to the equipment. Therefore, operation of the proposed project is not anticipated to result in excessive groundborne vibration.

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**Impact 4.9-3:** Project construction would temporarily increase ambient noise levels during the construction period.

**Significance:** Significant

**Mitigation 4.9-3(a):** Limit construction to daytime hours (8:00 a.m. to 5:00 p.m.) Monday through Friday (except construction of the pipeline across Second Street, which would occur at night to comply with the City of San Rafael's roadway construction policies,

## 4.9 NOISE

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and when the effects of construction on congestion would be minimal). No construction activities within 500 feet of residences should occur on Saturdays, Sundays, or holidays.

**Mitigation 4.9-3(b):** All powered construction equipment will be equipped with intake and exhaust mufflers recommended by the manufacturers thereof.

**Mitigation 4.9-3(c):** Locate all stationary noise-generating construction equipment, such as air compressors and portable power generators, as far as practical from existing noise-sensitive receptors.

**Mitigation 4.9-3(d):** Foundation pile holes should be pre-drilled where possible to reduce the number of impacts required to seat the pile. Consider using multiple pile drivers to reduce the number of days of pile-driving activity. Use of multiple pile drivers would slightly increase noise levels during construction but would reduce the construction duration.

**Mitigation 4.9-3(e):** Notify active land uses within 500 feet of pile driving activities of construction schedule.

**Mitigation 4.9-3(f):** Designate a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and would require that reasonable measures warranted to correct the problem be implemented. Conspicuously post the construction schedule and telephone number for the disturbance coordinator at the construction site.

**Residual Significance:** Significant

### **Discussion:**

It is anticipated that the 5 MGD desalination facility would take approximately 24 months to construct. The highest maximum noise levels generated by the project construction would be associated with pile driving and would typically range from about 100 to 105 dBA at a distance of 50 feet from the pile driver. Typical noise levels for construction trucks range from 82 to 93 dB at a distance of 50 feet from the source. Earth-moving tractors typically generate noise levels ranging from 76 to 95 dB at a distance of 50 feet from the source. Large pieces of earth-moving equipment, such as graders, scrapers, and bulldozers, generate maximum noise levels of 85 to 90 dBA at a distance of 50 feet. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding by buildings or terrain often results in much lower construction noise levels at distant receptors. The following construction activities would be associated with each component of the project:

**Desalination Plant:** Construction activities for the desalination plant would include site clearing and grading; installation of underground piping and utilities; pile driving and placement of foundations; walls, and roofs; installation of desalination process components; piping, pump, and electrical installation; testing and commissioning; and finishing work. Construction activities at

the site would occur during an approximately 24-month period. The highest noise levels would be generated during grading of the site and during periods of pile driving. Pile-driving activities typically range from about 100 to 105 dBA at a distance of 50 feet from the pile driver and would drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. The buildings nearest the construction site are approximately 100 to 200 feet away, so expected sound levels at these locations could range from 88 to 99 dBA. The Shoreline Park (Bay Trail) recreational facility, located on the levee adjacent to San Pablo Bay, is approximately 500 feet away from the plant site. Sound levels at this location would be lower than those expected at the nearest buildings. Surrounding land includes commercial and light industrial facilities, and San Rafael Bay to the east of the site. The nearest residences to the desalination plant site are located across San Rafael Bay.

Noise from pile-driving activities would be noticeable to businesses directly adjacent to the construction site, and some vibration may be perceptible but not damaging to buildings.

If needed, subsequent phases could add up to an additional 10 MGD capacity to the 5 MGD facility. Each of the two possible subsequent 5 MGD expansions which would take up to 18 months to complete and would involve primarily the installation of incremental desalination process equipment. These construction activities are not expected to generate high noise levels.

**On-shore Construction:** Construction activities for on-shore pipelines, tanks, and pumping stations would include clearing and grading, trenching, pipe installation, backfilling and compaction, hydrostatic testing, and cleanup and restoration. The highest noise levels would be generated during the clearing and grading of the site, and would range from 76 to 95 dBA at a distance of 50 feet from the source.

**Offshore Construction:** Off-shore construction would include the removal of the existing pier, the driving of 175 concrete piles to bedrock, the installation of the bridge deck on these piles, and the installation of the intake structure at the end of the pier. The highest maximum airborne noise levels generated by the project construction would be associated with pile driving and would typically range from about 100 to 105 dBA at a distance of 50 feet from the pile driver. Patrons of the Marin Rod & Gun Club would experience noise impacts during pier rebuilding, but impacts would be short-term and during daylight weekday hours.

Construction activities for the desalination facility, such as pile driving, generate high noise levels and noise that would be considered intrusive. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise sensitive land uses, or when construction durations last over extended periods of time. Limiting the hours when construction can occur to daytime hours is often a simple method to reduce the potential for noise impacts. In areas immediately adjacent to construction, controls such as constructing temporary noise barriers and using “quiet” construction equipment can also reduce the potential for noise impacts. There are no noise-sensitive receivers (i.e., residences) within 200 feet of the project sites. Most components of the project are in isolated areas, so the construction noise would be generally unnoticed. Patrons of the Marin Rod & Gun Club would experience construction noise impacts from the pier rebuilding. Construction noise impacts would also be experienced by commercial and light industrial uses in the vicinity of the desalination plant site and the Jacoby Street Pumping Station. The open space area specified as

## 4.9 NOISE

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the Ridgecrest A tank site is large, and this noise assessment assumes the tank would be constructed away from the residences bordering the Tiburon Ridge Preserve.

**Conclusion:** Although construction-related noise would be short-term and temporary, construction noise levels will at times exceed the impact significance criteria described in Section 4.9.2.1 even with the mitigation measures applied. Therefore, construction-related noise is considered significant and unavoidable.

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