4.13 NOISE AND VIBRATION

4.13.1 INTRODUCTION

This section describes and analyzes the current noise environment in the areas where project facilities will be located, and evaluates the potential impacts associated with the construction and operation of these facilities. The analysis in this section is based on the Noise Impact Analysis prepared for the project by Urban Crossroads (2016), which is provided in Appendix F. In addition, the General Plans and Municipal Codes of the jurisdictions in which the project will occur have been reviewed and analyzed in the context of the proposed project.

4.13.2 ENVIRONMENTAL SETTING

4.13.2.1 Noise Fundamentals

Noise is defined as "unwanted sound." Unwanted sound includes noise that interferes with normal activities, inflicts physical harm on individuals, or causes adverse effect on health. Excessive noise or prolonged exposure to noise can contribute to temporary and permanent impairments, such as hearing loss, fatigue, stress, sleep deprivation, anxiety and annoyance. Although noise has been accepted as a necessary by-product of urban development, it can become an environmental hazard. A variety of components of the urban environment generate noise; these include construction equipment and activities, motor vehicles, air traffic, mechanical equipment, household appliances, and other sources.

Noise sources can result from "line sources" or "point sources." Line sources include linear sources of noise, such as a freeway or busy street. Point sources are generally stationary, such as HVAC units, air compressors or the treatment equipment proposed as part of the project.

Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

The logarithmic nature of the decibel means that a doubling of sound energy of a noise source results in an increase in the decibel rating of only 3 dBA. For example, the doubling of traffic noise on a busy street will generally only increase sound levels by 3 dBA. Changes of 3 dBA are barely perceptible to the human ear. In order for a human ear to perceive a sound as being twice as loud, the sound must increase by nearly 10 dBA.

Noise levels are measured in several ways. In this analysis, two common measurement tools are utilized:

- Equivalent sound levels (Leq) are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). Leq represents a steady state sound level containing the same total energy as a time varying signal over a given sample period, and is commonly used to describe the "average" noise levels.

- The Community Noise Equivalent Level (CNEL) is a weighted average of the intensity of a sound, with adjustments for time of day, and averaged over 24 hours. The adjustments are made to account for the noise sensitive time periods during the evening and night hours, when sound appears louder. CNEL does not represent the actual sound level heard at any particular time, but rather represents the total sound exposure in a 24 hour period. It is most commonly used in city and county General Plans to describe acceptable, conditionally acceptable and unacceptable noise levels for different types of land uses.

Noise transmission is affected by a variety of factors, such as temperature, wind speed and direction, as well as the type of ground surface. Soft ground surfaces tend to reduce sound levels better than hard surfaces. This reduction of sound intensity caused by surfaces, walls, vegetation or other material is called attenuation. A drop off rate of 4.5 dBA per doubling distance is typical across soft ground. In comparison, hard ground, such as concrete, stone, and hard packed earth reduce sound by 3.0 dBA per doubling distance. Effective noise barriers, such as walls or berms, can help reduce noise levels by 10 to 15 decibels. These types of barriers can provide relief from traffic noise. Vegetation, on the other hand, is less effective for reducing noise levels. For a noise barrier to work, walls need to be high enough and long enough to block the view of a road.

4.13.2.2 Existing Noise Conditions at Project Sites

The proposed project will occur across multiple jurisdictions in the Coachella Valley These local jurisdictions focus their noise attenuation and control on traffic noise barriers. In the cities of Desert Hot Springs, Rancho Mirage, Palm Desert and La Quinta, development is primarily residential and resort oriented, with commercial nodes on major arterials. In the City of Indio, residential development dominates with industrial development areas which have developed around railroad lines, Interstate 10 (I-10) and State Highway 86. The unincorporated community of Thermal is primarily agricultural and rural residential in character.

With the exception of lands immediately adjacent to major arterials, highways, freeways and railroad lines, noise levels in the affected jurisdictions are generally low, and controlled by noise attenuating walls surrounding residential communities and neighborhoods.

The noise impact analysis included 24-hour monitoring at six representative sensitive receptors within the project area. All six monitoring sites were selected for their proximity to existing or proposed project sites and their ability to represent the typical noise characteristics in the vicinity of project sites. Representative sites chosen best characterize the noise environment for sensitive receptors within the project area.

The six noise monitoring locations are shown on Figure 4.13-1.

The results of the noise monitoring at representative sites are provided in Table 4.13-1.

As shown in the table, the current noise environment adjacent to project sites is generally quiet, and meets the standards for residential outdoor noise levels.

TABLE 4.13-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location Number [1]	Date of Noise Measurements	Distance To Nearest Project Site	Location Description	Energy Average Hourly Noise Level (dBA Leq)[2]		CNEL
				Daytime	Nighttime	
L1	9/28-9/29/2015	106'	Located north of Dillon Road near the existing WBA well sites and residential homes in Desert Hot Springs. This location is also north of the proposed ID8 WBA Water Treatment Facility.	53.6	51.4	58.5
L2	9/28-9/29/2015	140'	Located in the City of Palm Desert, south of Frank Sinatra Road and west of Cook Street adjacent to SBA Well 5677-1 and an existing golf course and residential homes.	56.4	45.0	56.3
L3	9/28-9/29/2015	160'	Located in the City of Indio at the northwest corner of Adams Street and Avenue 38 adjacent to an existing barrier for residential homes, near SBA Well 4720-1.	62.6	57.5	65.3
L4[3]	9/28/2015	540'	Located in the City of La Quinta, north of Airport Boulevard near an existing golf course and residential homes. The proposed La Quinta WBA Water Treatment Facility would be located south of this location on Airport Boulevard.	45.9	n/a	n/a
L5[4]	9/28-9/29/2015	655'	Located south of the City of Coachella and south of Airport Boulevard near SBA Wells 6805-1 and 6808-1 and existing residential homes.	53.4	48.2	n/a
L6	9/28-9/29/2015	3,120'	Located south of Avenue 62 near existing residential homes. The proposed CRRF site is located southwest of this measurement location.	45.2	45.1	51.9

[1] See Exhibit 4-A and Appendix 4.1 for the noise level measurement locations.
[2] The long-term 24-hour measurement worksheets are included in Appendix F.
[3] A total of 6 hours of data were collected at location L4, per standard methodology
[4] A total of 16 hours of data were collected at location L5 per standard methodology
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "n/a" = See footnote for individual measurement location.

The noise monitoring results are reported using Leq noise levels. The findings of the noise monitoring are briefly summarized below.

- Location L1 is north of Dillon Road, near the existing WBA well cluster and residential homes south of the City of Desert Hot Springs. Location L1 is located north of the proposed ID8 WBA Water Treatment Facility site. The noise measurements show an overall 24-hour exterior noise level of 58.5 dBA CNEL. The average daytime noise level was 53.6 dBA Leq with an average nighttime noise level of 51.4 dBA Leq.

- Location L2 is in the City of Palm Desert, south of Frank Sinatra Drive, and west of Cook Street. This monitoring location is adjacent to SBA well 5677-1, an existing golf course, and existing homes. The noise measurements show an overall 24-hour exterior noise level of 56.3 dBA CNEL. The average daytime noise level was calculated at 56.4 dBA Leq, with an average nighttime noise level of 45.0 dBA Leq.

- Location L3 is in the City of Indio, at the northwest corner of Adams Street and Avenue 38. This monitoring location is adjacent to an existing barrier for homes near SBA well 4720-1. The 24-hour CNEL exterior noise level is 65.3 dBA CNEL. The average daytime noise level was 62.6 dBA Leq, and the average nighttime noise level was 57.5 dBA Leq.

- Location L4 is in the City of La Quinta, north of Airport Boulevard near the Greg Norman Golf Course, within the residential community situated there. The proposed La Quinta WBA Water Treatment Facility is located south of this location beyond the golf course fairway on Airport Boulevard. Six hours of data were collected at measurement location L4 per standard methodology. The hourly noise levels measured at location L4 ranged from 43.4 to 49.3 dBA Leq during the daytime hours. The average daytime noise level was calculated at 45.9 dBA Leq.

- Location L5 is south of the City of Coachella in the unincorporated community of Thermal, and south of Airport Boulevard, near SBA well sites 6805-1 and 6808-1 and existing homes. A total of 16 hours of data were collected per standard methodology. The average daytime noise level was calculated at 53.4 dBA Leq, and the average nighttime noise level was 48.2 dBA Leq.

- Location L6 is south of Avenue 62, near existing residential homes. The proposed CRRF site is located southwest of this measurement location. The 24-hour CNEL indicates that the overall exterior noise level is 51.9 dBA CNEL. The average daytime noise level was 45.2 dBA Leq, and the average nighttime noise level was 45.1 dBA Leq.

4.13.3 REGULATORY FRAMEWORK

4.13.3.1 Federal

No federal regulations pertaining to noise would be applicable to the proposed project.

4.13.3.2 State

Chapter 12 of the California Building Code

Chapter 12 of the California Building Code establishes guidelines for appropriate noise level ranges for a variety of land uses within a community. The range of allowable exterior noise levels for various land uses is shown in Figure 4.13-1. This matrix is used to ensure noise compatibility of proposed land uses and helps predict the future noise environment. Where sensitive land uses will be exposed to noise levels of 60 dBA CNEL or higher, an acoustical study may be required. In residential areas in California, the standard is a CNEL of 65 dBA. Mitigation measures are required where sensitive land uses will be exposed to noise levels greater than 65 dBA CNEL. As shown in Figure 4.13-2, the normally acceptable noise level for utility facilities, including those proposed by the project, is 75 dBA CNEL. According to the Code, interior noise levels from exterior sources must not exceed 45 dB in any habitable room.

4.13.3.3 Local

Project facilities will occur in several jurisdictions in the Coachella Valley: the cities of Desert Hot Springs, Rancho Mirage, Palm Desert, La Quinta, Indio, and the unincorporated community of Thermal. Each of these jurisdictions has established standards for acceptable noise levels for various land uses in their General Plans and Municipal Codes. Each of the jurisdictions' General Plan noise policy or standards are briefly summarized below.

Desert Hot Springs General Plan

The City of Desert Hot Springs General Plan Noise Element uses the Community Noise Equivalent Level (CNEL) depicted in Figure 4.13-2 to guide noise levels in the City. The Noise Element identifies noise levels in the community as generally quiet, with the primary source of noise generation being motor vehicles. The Goal and key policies of the General Plan include:

> *Goal:* A noise environment providing peace and quiet that complements and is consistent with the City's spa resort and residential character and the various mix of land uses comprising the community.
>
> *Policy 2:* Protect noise sensitive land uses, including residences, resorts and community open space, schools, libraries, churches, hospitals and convalescent homes from high noise levels from both existing and future noise sources.
>
> *Program 2 B:* On a project-specific basis, require the installation of sound walls, earthen berms, wall and window noise insulation and other mitigation measures in areas exceeding the City's noise limit standards.

Rancho Mirage General Plan

The City of Rancho Mirage General Plan Noise Element sets policy for the City's noise environment. The City uses the CNEL standard to establish an acceptable noise environment. The primary noise source in the City is vehicle noise on city streets. Key policies of the Noise Element include:

> *Policy 2:* Noise sensitive land uses, including residences, resorts, community open space, schools, libraries, churches, hospitals, and convalescent homes shall be protected from high noise levels emitted by both existing and future noise sources.

Program 2.A: On a project-specific basis, apply noise mitigating site planning and require the installation of soundwalls, earthen berms, wall and window noise insulation, and/or other mitigation measures in areas exceeding the City's noise limit standards.

Palm Desert General Plan

The City of Palm Desert General Plan Noise Element relies on the CNEL standards depicted in Figure 4.13-2 above. As with other cities in the Coachella Valley, the City's primary noise source is vehicular traffic. The Element also identifies the Union Pacific Railroad lines in the northern part of the City as a noise source. Key goals and policies of the Noise Element include:

Goal: A noise environment that respects community residents and reflects the community's appreciation for a sense of place, with the peace and quiet that is in balance with the City' resort residential character, sensitive receptors and natural wildlife habitats.

Policy 1: Noise sensitive uses, including residential neighborhoods, schools, congregate care facilities, libraries, churches, resorts, wildlife habitat, and community open space shall be protected from potentially significant sources of community noise.

Program 1.C: Where noise mitigation measures are required to achieve the City's noise limit standards, the emphasis of such measures shall be placed upon site planning and project design. On a project-specific basis, the use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project building.

La Quinta General Plan

As with the other cities in the Valley, La Quinta relies on CNEL standards to quantify its noise environment. The Noise Element identifies traffic noise as the most common noise source, and also acknowledges overflights from both the Bermuda Dunes and Jacqueline Cochran Regional airports. Key policies of the Noise Element include:

Policy N-1.1: Noise standards in the City shall be consistent with the Community Noise and Land Use Compatibility scale described in this Element.

Program N-1.1.a: Propose to City Council an amendment to the Municipal Code (Section 9.100.210) to allow 65 dBA CNEL for sensitive land uses.

Indio General Plan

The Indio General Plan Noise Element contains key policies relating to noise, including:

Policy NOI-1.1: **Sensitive Receptors** Prohibit the development of new commercial, industrial, or other noise-generating land uses adjacent to existing residential uses and sensitive noise receptors such as schools, health care facilities, libraries and churches if noise levels are to exceed 65 dBA CNEL (decibels on A-weighted scale Community Noise Equivalent Level).

Policy NOI-1.2: **Sleep Interference** Ensure that excessive noise levels do not interfere with sleep through the implementation of land use requirements.

Policy NOI-1.3: **Protect Residential Areas** Ensure that exterior noise levels for dwellings in residential areas no not exceed exterior noise levels of 65 dBA CNEL and interior noise levels of 45 dBA CNEL.

County of Riverside General Plan

The County's General Plan Noise Element relies on CNEL standards, consistent with other jurisdictions in the Coachella Valley. Relevant policies of the Noise Element include:

Policy N 1.5: Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

Policy N 1.8: Limit the maximum permitted noise levels that cross property lines and impact adjacent land uses, except when dealing with noise emissions from wind turbines.

Policy N 2.3: Mitigate exterior and interior noises to the levels listed in the table below to the extent feasible, for stationary sources.

Table 4.13-2: Stationary Source Land Use Noise Standards [1]

Land Use	Interior Standards	Exterior Standards
Residential		
10:00 p.m. to 7:00 a.m.	40 L_{eq} (10 minute)	45 L_{eq} (10 minute)
7:00 a.m. to 10:00 p.m.	55 L_{eq} (10 minute)	65 L_{eq} (10 minute)

[1]These are only preferred standards; final decision will be made by the Riverside County Planning Department and Office of Public Health.

Policy N 4.3: Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed, and ensure that the recommended mitigation measures are implemented.

Municipal Code Standards

Jurisdictions address the noise levels that are acceptable on an ongoing, daily basis, and noise levels during construction. Daily operational noise standards are shown in Table 4.13-3, below.

TABLE 4.13-3: LOCAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Exterior Noise Level Standards[8]						
			Leq (Hourly)	L_{50} (30 mins)	L_{25} (15 mins)	L_{17} (10 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (<1 min)
County of Riverside[1]	Residential	7:00 a.m. to 10:00 p.m.	65	-	-	-	-		-
		10:00 p.m. to 7:00 a.m.	45	-	-	-	-		-
Desert Hot Springs[2]	Residential	Anytime	65	-	-	-	-		-
Rancho Mirage[3]	Residential (Low Density)	7:00 a.m. to 6:00 p.m.	-	55	58	60	65	70	75
		6:00 p.m. to 10:00 p.m.	-	50	53	55	60	65	70
		10:00 p.m. to 7:00 a.m.	-	45	48	50	55	60	65
	Residential (Medium, High Density, Hospital, Open Space)	7:00 a.m. to 6:00 p.m.	-	60	63	65	70	75	80
		6:00 p.m. to 10:00 p.m.	-	55	58	60	65	70	75
		10:00 p.m. to 7:00 a.m.	-	50	53	55	60	65	70
Palm Desert[4]	Residential (All Zones)	7:00 a.m. to 10:00 p.m.	55	-	-	-	-	-	-
		10:00 p.m. to 7:00 a.m.	45	-	-	-	-	-	-
La Quinta[5]	Residential, Schools, Hospitals & Churches	7:00 a.m. to 10:00 p.m.	-	60	65	-	70	75	80
		10:00 p.m. to 7:00 a.m.	-	50	55	-	60	65	70
Indio[6]	Any Other Property	Permitted Hours[7]	65	-	-	-	-	-	-
		Any Other Time	45	-	-	-	-	-	-
		10:00 p.m. to 6:00 a.m.	45	-	-	-	-	-	-

[1] Source: County of Riverside General Plan Noise Element, Table N-2.
[2] Source: City of Desert Hot Springs Municipal Code, Section 17.40.180 (A).
[3] Source: City of Rancho Mirage Municipal Code, Section 8.45.030 (A) & (B).
[4] Source: City of Palm Desert Municipal Code, Section 9.24.030 (A).
[5] Source: City of La Quinta Municipal Code, Section 9.100.210 (B) & (C).
[6] Source: City of Indio Municipal Code, Section 159.107 (H) (1).
[7] City of Indio permitted operation hours for Pacific Standard Time: Monday-Friday 7:00 a.m. - 6:00 p.m., Saturday 8:00 a.m. - 6:00 p.m., Sunday 9:00 a.m. - 5:00 p.m.; for Pacific Daylight Time: Monday - Friday 6:00 a.m. - 6:00 p.m., Saturday 7:00 a.m. - 6:00 p.m., Sunday 9:00 a.m. - 5:00 p.m.; for Government Holidays: 9:00 a.m. 5:00 p.m.
[8] Leq represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{25} is the noise level exceeded 25% of the time.

Finally, governmental facilities are exempt from noise level limitations in Riverside County's Municipal Code, Section 9.52.020(A). This exemption applies to CVWD facilities. This exemption is also found in the Municipal Codes of the cities of Desert Hot Springs, Rancho Mirage, Palm Desert, La Quinta, Indio, and Coachella.

4.13.3.3 Stationary Source Standards

The cities and Riverside County have established standards in their Municipal Codes for stationary sources of noise. In general, these standards are associated with generators, pool pumps and HVAC equipment associated with residential, commercial and industrial development. Equipment as specialized as that proposed for the project is not explicitly addressed in local ordinances. Generally, however, the County of Riverside's standard of 65 dBA Leq for daytime hours, and 45 dBA Leq for nighttime periods, is consistent with the cities' standards, and the more general State requirements.

4.13.3.4 Construction Standards

Each local jurisdiction establishes exemptions to their noise standards, primarily associated with governmental activities or private and public sector construction activities during prescribed time periods. Generally, local jurisdictions exempt construction activities during the less sensitive daytime hours. During Standard Tim periods, construction hours are from 7 AM to 6 PM, and during Daylight Savings Time periods, from 6 AM to 7 PM. Most jurisdictions exclude holidays and/or Sundays from the construction exemption, except for emergency governmental activities. If construction activities occur during the prescribed hours, they are exempt from noise standards.

4.13.3.5 Construction Vibration Standards

Vibration levels with peak particle velocity of 0.787 inches per second are considered readily perceptible. Levels above 0.1968 in/sec are considered annoying to people in buildings. The County of Riverside identifies a vibration perception threshold of 0.01 in/sec. For vibration levels expressed in velocity, the human body responds to the average vibration amplitude often described as the root-mean-square (RMS). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a one-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to reduce the range of numbers used to describe human response to vibration. Therefore, the vibration standard of 0.01 in/sec in RMS velocity levels was used in this analysis to assess the human perception of vibration levels associated with the project's construction activities.

4.13.4 IMPACTS AND MITIGATION MEASURES

4.13.4.1 Significance Criteria

Based on the State CEQA Guidelines, Appendix G, the proposed project would have a significant effect relating to noise, if it were to:

a. Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b. Expose persons to or generate excessive ground-borne vibration or ground-borne noise levels.

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

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

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

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

4.13.4.2 Approach to Analysis

Construction Noise

Construction of the project would require the demolition of certain existing facilities within the CVWD well sites (e.g. screening walls and buildings), the grading and excavation of sites, the building of new facilities, and the application of architectural coatings. The construction activities associated with the proposed project would result in noise from heavy equipment, power tools and portable generators. When used concurrently, construction equipment can generate high noise levels.

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) was used to analyze construction noise associated with the proposed project. The RCNM includes a database of construction equipment noise emission levels, providing a comprehensive list of the noise generating characteristics for a wide range of construction equipment. In addition, the database provides an acoustical usage factor to estimate the time during which each piece of construction equipment is operating at full power. The usage factor is critical to calculate the average Leq noise levels using the Lmax noise levels measured at a distance of 50 feet.

According to the RCNM, noise levels generated by heavy construction equipment can range from approximately 86 dBA to 92 dBA when measured at 50 feet. Distance from the construction site reduces the noise levels by 6 dBA per doubling of distance. For example, a noise level of 92 dBA measured at 50 feet from the source is reduced to 86 dBA at 100 feet, and further reduced to 80 dBA at 200 feet from the source.

While some existing CVWD facilities would require less equipment and construction activity than others, the peak number of construction equipment by phase was used to evaluate the construction activities for each of the CVWD facilities to represent worst-case construction noise levels.

Operational Noise

In order to estimate the potential impacts associated with operational noise from the project's facilities, noise measurements were made at existing CVWD facilities which currently include mechanical equipment. These measurements were used to establish anticipated noise levels from the proposed project's equipment. The results of the measurements are shown in Table 4.13-4.

TABLE 4.13-4: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Well Site Number	Duration (h:mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Reference Noise Level (dBA Leq)
Well Pump Activity[1]	5676-2	0:02:00	3'	5'	69.8
Well Pump Activity[2]	5678-1	0:00:52	3'	5'	64.2
Generators[3]	n/a	n/a	23'	9'	51.2

[1] As measured by Urban Crossroads, Inc. on 9/29/2015 at the existing CVWD well site no. 5676-2 located at 38-130 Portola Avenue in the City of Palm Desert.
[2] As measured by Urban Crossroads, Inc. on 9/29/2015 at the existing CVWD well site no. 5678-1 located at 74-885 Frank Sinatra Drive in the City of Palm Desert.
[3] Source: CAT XQ 350 Portable Generator Specification Sheet, Noise Rating at 100% of generator load at 60 Hz. Sound Power Level of 76 dBA at 23 feet converted to a sound pressure level (Leq).

SBA well 5676-1, located at 38-130 Portola Avenue in the City of Palm Desert, was measured to describe the well pump activity which can be expected at project facilities. Well pump activity generates noise levels of 69.8 dBA Leq at a distance of 3 feet. A second well pump activity measurement was taken at CVWD well site number 5678, located at 74-885 Frank Sinatra Drive in the City of Palm Desert. A noise level of 64.2 dBA Leq was measured at that location. In order to provide a conservative analysis, a noise level of 69.8 dBA Leq has been used in this analysis to represent peak well pump activity associated with the project facilities.

To estimate the operational noise levels associated with the expected generators that would be used at some of the project facilities, the noise level specifications of a CAT XQ 350 generator, when running at 100% capacity in standby mode at 60 Hz, was obtained from the Caterpillar, Inc. website (Caterpillar, Inc., July 2013). The noise level specifications are 51.2 dBA Leq at a distance of 23 feet is the highest of all the noise levels provided on the CAT XQ 350 generator specification sheet. For purposes of this analysis, this most conservative noise level was used to represent the worst-case operational conditions of the generators to be used for the proposed project.

Vibration

Vibration would be generated by vehicle traffic and equipment during the construction of the proposed project. Vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity. The vibration resulting from construction equipment, however, has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized in Table 4.13-5.

TABLE 4.13-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT	
Equipment	**PPV (in/sec) at 25 feet**
Small bulldozer	0.003
Loaded Trucks	0.076
Large bulldozer	0.089
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.	

Areas of No Project Impact

The proposed project would have no impact on the following two impact criteria for the reasons identified below:

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

The project includes a two SBA well sites (6805-1 and 6806-1) located approximately 1.5 miles west of the Jacqueline Cochran Regional Airport. The 65 dBA noise contours for the Airport are contained within airport property. The noise levels from the airport at the SBA well sites will be well outside the airport noise contour, and no impact will occur.

There are no private airstrips in the vicinity of any of the proposed project facilities. No impacts associated with noise from private airstrips will occur.

4.13.4.3 Construction Impacts and Mitigation Measures

Impact NV-1: Project construction would result in noise levels in excess of local standards. (Less than Significant with Mitigation)

Riverside County and the cities have established limits to the hours of operation for construction activities, as shown in Table 4.13-3, Local Noise Standards. All the affected jurisdictions have implemented these limitations, which result in construction activities between the prescribed hours being considered exempt from the noise standards of the ordinance.

Neither the County nor the affected cities have vibration standards for temporary construction, but the County's General Plan Noise Element does contain the human reaction to typical vibration levels. Vibration levels with peak particle velocity of 0.787 inches per second are considered readily perceptible and above 0.1968 in/sec are considered annoying to people in buildings. County General Plan Policy 15.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz. For purposes of this analysis, the perception threshold of 0.01 in/sec was used to assess the potential impacts associated with construction of the proposed project at nearby sensitive receptor locations.

Using the stationary-source RCNM noise prediction model and the equipment mix proposed for the project, the project's construction activity noise level impacts for each phase were completed. Table 4.13-6 provides a summary of construction noise levels for each stage of construction activity. Detailed tables for each phase of construction are provided in Appendix F, Noise Impact Analysis.

TABLE 4.13-6: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Construction Phase	Construction Phase Hourly Noise Level At 50 Feet (dBA Leq)[1]	Distance To 65 dBA Leq Noise Level Contour[2]
Demolition	86.2	573'
Grading/Excavation	87.4	657'
Building Construction	91.7	1,076'
Paving	85.9	557'
Architectural Coating	86.0	561'

[1] Construction equipment noise levels by phase are shown on Tables 7-1 to 7-6 of the Noise Impact Analysis.
[2] Estimated distance to the 65 dBA Leq noise level contour for each phase of construction activity. Exhibits for each CVWD well facility's construction noise level contours are provided in Appendix 7.1 of the Noise Impact Analysis.

As shown in Table 4.13-6, the highest construction noise level impacts would occur during building construction activities, when the unmitigated peak construction noise levels are expected to range as high as 91.7 dBA Leq at a distance of 50 feet from the site boundaries of each location. The distance to the 65 dBA Leq noise level contour would range from 557 to 1,076 feet. High noise levels would also result from all construction activities, whether associated with specific facilities on specific sites, or with the extension pipelines to and from these sites. Sensitive receptors within the unmitigated 65 dBA Leq noise contour boundaries may perceive a noise level impact when construction activities occur. As shown in Table 4.13-7, residential receptors adjacent to the proposed project's well facilities have existing 6-foot high perimeter walls that will reduce the noise levels from project construction activities.

All of the affected jurisdictions rely on limited construction hours to mitigate construction impacts. In addition to this mitigation measure, included below, additional mitigation measures designed to further lower the noise levels of construction activities are provided below. With the implementation of Mitigation Measure NV-1, noise levels due to construction activities will be less than significant.

Mitigation Measure NO-1: The following measures shall be implemented as part of project construction:

- The contractor shall require that Project construction activities only occur between the hours prescribed in each affected jurisdiction's Municipal Code. The project construction supervisor shall ensure compliance.

- The contractor shall require all construction equipment, fixed or mobile, be equipped with properly operating and maintained mufflers, consistent with manufacturers' standards.

- The construction supervisor shall place all stationary construction equipment so that emitted noise is directed away from the noise-sensitive receptors nearest the project site.

- The construction supervisor shall locate equipment staging in areas that would create the greatest distance between construction-related noise sources and noise-sensitive receptors (i.e., on the access roads or at the center of each facility).

- The construction supervisor shall limit haul truck deliveries to the same hours specified for construction equipment.

- The construction supervisor shall require truck trips be limited to the hours of construction activity.

- The construction supervisor shall maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.

- The construction supervisor shall require the truck access gates and loading areas be posted with signs which state:
    - Truck drivers shall turn off engines when not in use;
    - No music or electronically reinforced speech from workers shall be audible at noise-sensitive properties.

Impact NO-2: Project construction would not result in excessive groundborne vibration. (Less than Significant)

Vibration can result from the operation of construction equipment, and can impact surrounding sensitive receptors. The level of impact is highly dependent on the equipment used, the distance to the affected structures, and soil type. The project's construction activities would result in vibration from the use of heavy equipment. The equipment to be used for the proposed project, and the distance from buildings would not, however, result in the potential for damage to nearby structures.

Grading activities at each project location would have the potential to generate low levels of ground-borne vibration. Using the vibration source level of construction equipment provided in Table 4.13-5, Vibration Source Levels for Construction Equipment, and the construction vibration assessment methodology published by the FTA, project-related vibration impacts were estimated. Trucks and heavy equipment transiting on project sites, including sites located in proximity to existing residential development, such as the La Quinta WBA Water Treatment facility, would be travelling at very low speeds so it is expected that construction equipment vibration impacts at nearby residential homes would not exceed the vibration threshold of 0.01 in/sec (RMS). Because the vibration levels would be below the threshold established by the County for vibration levels, impacts are expected to be less than significant.

4.13.4.3 Operational Impacts and Mitigation Measures

Impact NO-3: Operation of the project would not result in exposure of people to noise levels in excess of local noise standards or result in a substantial permanent increase in ambient noise levels in the project vicinity. (Less than Significant)

As described in Section 4.13.3, State and local standards require that outdoor noise levels for sensitive receptors be 65 dBA CNEL or less. The analysis evaluated the noise levels anticipated for each new facility, and considered whether it would result in noise levels in excess of 65 dBA CNEL. A noise impact of more than 65 dBA CNEL would result in a potentially significant impact that would require mitigation. It is important to note that the operational noise contour boundaries below do not account for any additional attenuation provided by existing barriers or topography.

As described in Section 4.13.2 and Table 4.13-4, operational noise levels at SBA well sites are expected to range from 51.2 dBA Leq for generators to 69.8 dBA Leq for well pumps. As shown in Table 4.13-7. the distances to the 65 dBA Leq noise level contour boundaries of each noise source would be 5 feet from the source.

TABLE 4.13-7: UNMITIGATED OPERATIONAL NOISE LEVEL

Reference Noise Source	Reference Hourly Noise Level (dBA Leq)[1]	Reference Measurement Distance To Source	Distance To 65 dBA Leq Noise Level Contour[2]
Well Pump Activity	69.8	3'	5'
Generators	51.2	23'	5'

[1] Reference noise levels as previously shown on Table 5-1.
[2] Estimated distance to the 65 dBA Leq noise level contour for each source.

Based on these assumptions, the operational noise activities would generate 65 dBA Leq noise level contour boundaries that will largely be located within the boundaries of each well facility. The exact location of each 65 dBA Leq noise level contour for each CVWD well facility would depend on the location of each noise source, existing noise barriers in the area, and the topographic differences between the sources and receiver locations.

Governmental facilities are exempt from noise level limitations in Riverside County's Municipal Code, Section 9.52.020(A). This exemption applies to CVWD facilities. This exemption is also found in the Municipal Codes of the cities of Desert Hot Springs, Rancho Mirage, Palm Desert, La Quinta, Indio, and Coachella. Therefore, the operational noise levels of the proposed project will be exempt from the noise standards. However, notwithstanding this exemption, the noise levels at the existing SBA well sites after project equipment is installed would be the same as those associated with the existing CVWD well sites, and would result in minimal changes to the operational noise environment of each existing facility.

The project would also include three new treatment facilities (ID8 WBA Water Treatment Facility, La Quinta WBA Water Treatment Facility, and the CRRF). The operational noise levels will be 65 dBA Leq at a distance of 5 feet from the equipment used by the proposed project, as shown in Table 4.13-6. As shown in Table 4.13.7, where project facilities occur near residential land uses, the distance to these land uses exceeds 5 feet. Therefore, the operational noise sources resulting from the proposed project are expected to be consistent with those at nearby existing facilities at each location, and will not exceed local standards of 65 dBA CNEL for sensitive receptors..

The distances from the property line of each of the proposed facilities to the closest noise source are shown on Table 4.13.8. The Table shows that the operational noise levels at only one well site, 5677-1, may extend to an adjacent residential land use. However, these noise levels would be reduced by the proposed screen wall between the well site and residential land use. The screen wall is a project design feature and therefore is a required project component.

The operational noise level impacts related to the project will be less than significant.

TABLE 4.13-8: OPERATIONAL NOISE LEVEL COMPLIANCE

Well Site (Number/Name)[1]	Distance from Property Line To Closest Noise Source (Feet)[2]	Adjacent to Residential Land Uses?[3]	Does the Noise Contour Extend Beyond the Property Line?[4]	Planned or Existing Screen Wall?[5]
3405-1 (inactivate)	n/a	n/a	n/a	n/a
3408-1	5'	No	No	No
3409-2	5'	Yes	No	No
3410-1	6'	No	No	No
4510-1	14'	No	No	Yes
4610-1	14'	No	No	Yes
4628-2 (inactivate)	n/a	n/a	n/a	n/a
4720-1	3'	No	Yes	Yes
4721-1	3'	No	Yes	Yes
4722-1	9'	No	No	Yes
5632-2	3'	No	Yes	Yes
5657-2	10'	No	No	Yes
5664-1	3'	No	Yes	Yes
5676-2	3'	No	Yes	Yes
5677-1	4'	Yes	Yes	Yes
5678-1	8'	No	No	Yes
5679-1	3'	No	Yes	Yes
5711-2	2'	No	Yes	Yes
5717-1	6'	No	No	Yes
5718-1	5'	No	No	Yes
5719-1	29'	Yes	No	Yes
5720-1	7'	No	No	Yes
6701-1	3'	No	Yes	No
6723-1	8'	Yes	No	No
6724-1	6'	No	No	Yes

TABLE 4.13-8: OPERATIONAL NOISE LEVEL COMPLIANCE				
Well Site (Number/Name)[1]	**Distance from Property Line To Closest Noise Source (Feet)[2]**	**Adjacent to Residential Land Uses?[3]**	**Does the Noise Contour Extend Beyond the Property Line?[4]**	**Planned or Existing Screen Wall?[5]**
6725-1	6'	No	No	Yes
6726-1	3'	No	Yes	Yes
6728-1	5'	No	No	Yes
6734-1	13'	No	No	Yes
6805-1	33'	No	No	No
6808-1	23'	No	No	No
Central Resin Regeneration Facility	n/a	No	No	No
ID8 WBA Water Treatment Facility	20'	No	No	No
La Quinta WBA Treatment Facility	28'	No	No	Yes

[1] Well site and noise source locations as shown in Appendix F.
[2] Distance to the nearest noise source based on the site plans for each well site provided in Appendix F.
[3] Well site locations in relation to adjacent land uses as shown in Appendix F.
[4] Is the distance from the property line to the closest noise source less than the reference 65 dBA Leq noise level contours at 5 feet?
[5] Based on the site plans for each well site provided in Appendix F and existing conditions observed in the Project study area.
"n/a" = The well site is indicated as abandoned. No new operational noise levels are expected.

4.13.5 SIGNIFICANCE AFTER MITIGATION

With the implementation of the mitigation measures described herein, the potential noise impacts associated with construction and operation of the proposed project will be reduced to less than significant levels.

4.13.6 CUMULATIVE IMPACTS

The geographic scope for the analysis of potential cumulative noise impacts includes both the land and land uses immediately adjacent to each project site and the noise environment in each affected jurisdiction. Consistent with CEQA Guidelines Section 15130(b)(1)(B), the cumulative impacts analysis was performed using growth projects in the affected jurisdictions. The project would contribute to cumulative noise impacts if the proposed project, when added to the noise levels in the vicinity of each project site, would exceed the standards in Table 4.13.2 at build out of each jurisdiction.

The project SBA and WBA wells sites are expected to operate at noise levels that are essentially the same as current conditions. As shown in Table 4.13-7, the new project's treatment facilities would not generate unmitigated noise levels that exceed 65 dBA Leq at 5 feet from project facilities for any sensitive receptor, which would be within the site boundaries of these facilities. Operational noise levels resulting from the proposed project would not exceed city or county standards for sensitive receptors, nor would they result in substantial permanent increases in ambient noise levels in the project vicinity

above levels existing without the project. Therefore, noise impacts associated with the proposed project would not be cumulatively considerable.

4.13.7 REFERENCES

City of Desert Hot Springs. 2000. *City of Desert Hot Springs Comprehensive General Plan*.

City of La Quinta. 2013. *2035 La Quinta General Plan*.

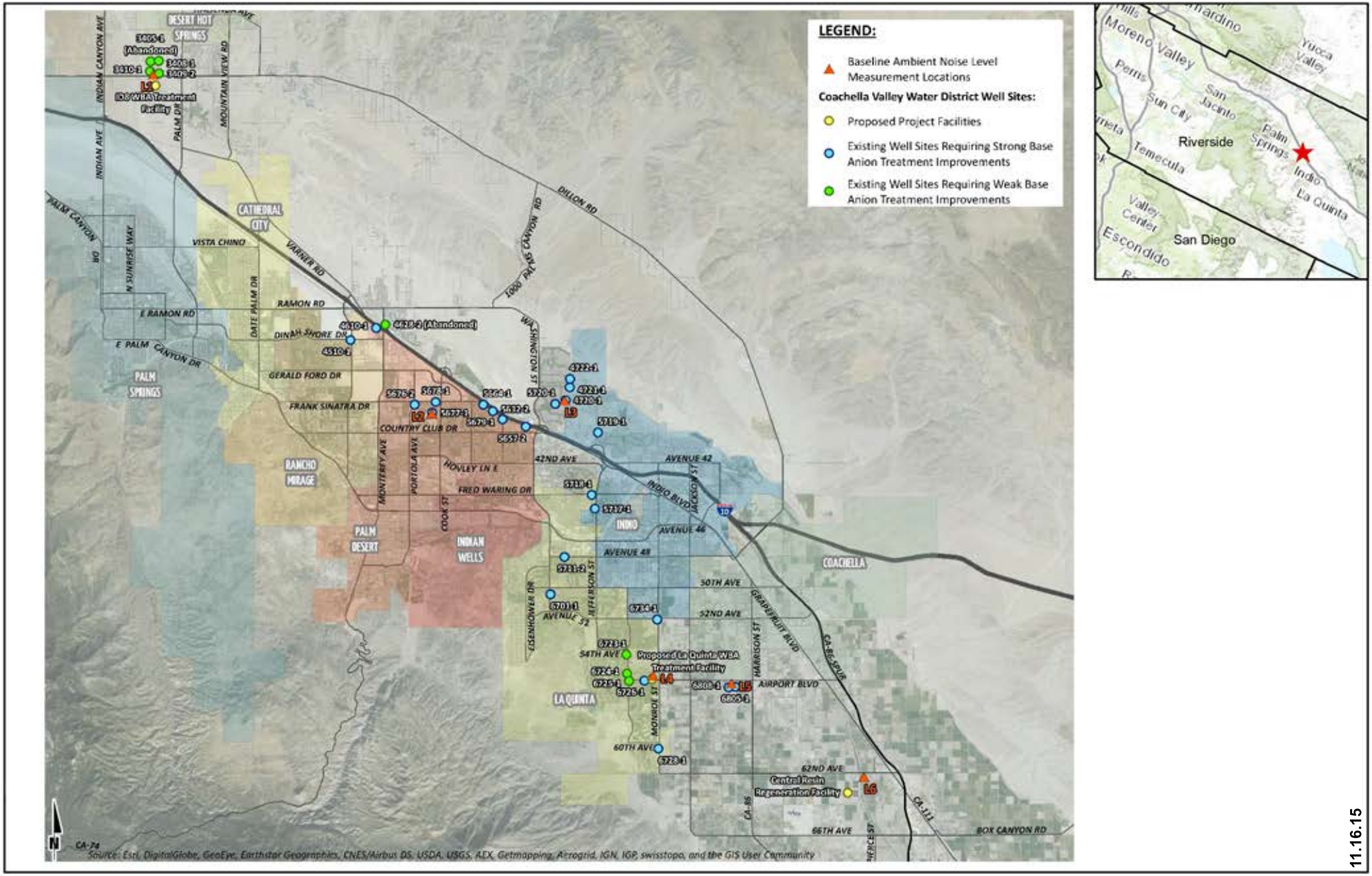
City of Palm Desert. 2004. *City of Palm Desert Comprehensive General Plan*.

City of Rancho Mirage. 2005. *City of Rancho Mirage General Plan*.

City of Indio. 1994. *Indio General Plan*.

Riverside County. 2014*. Riverside County General Plan*.

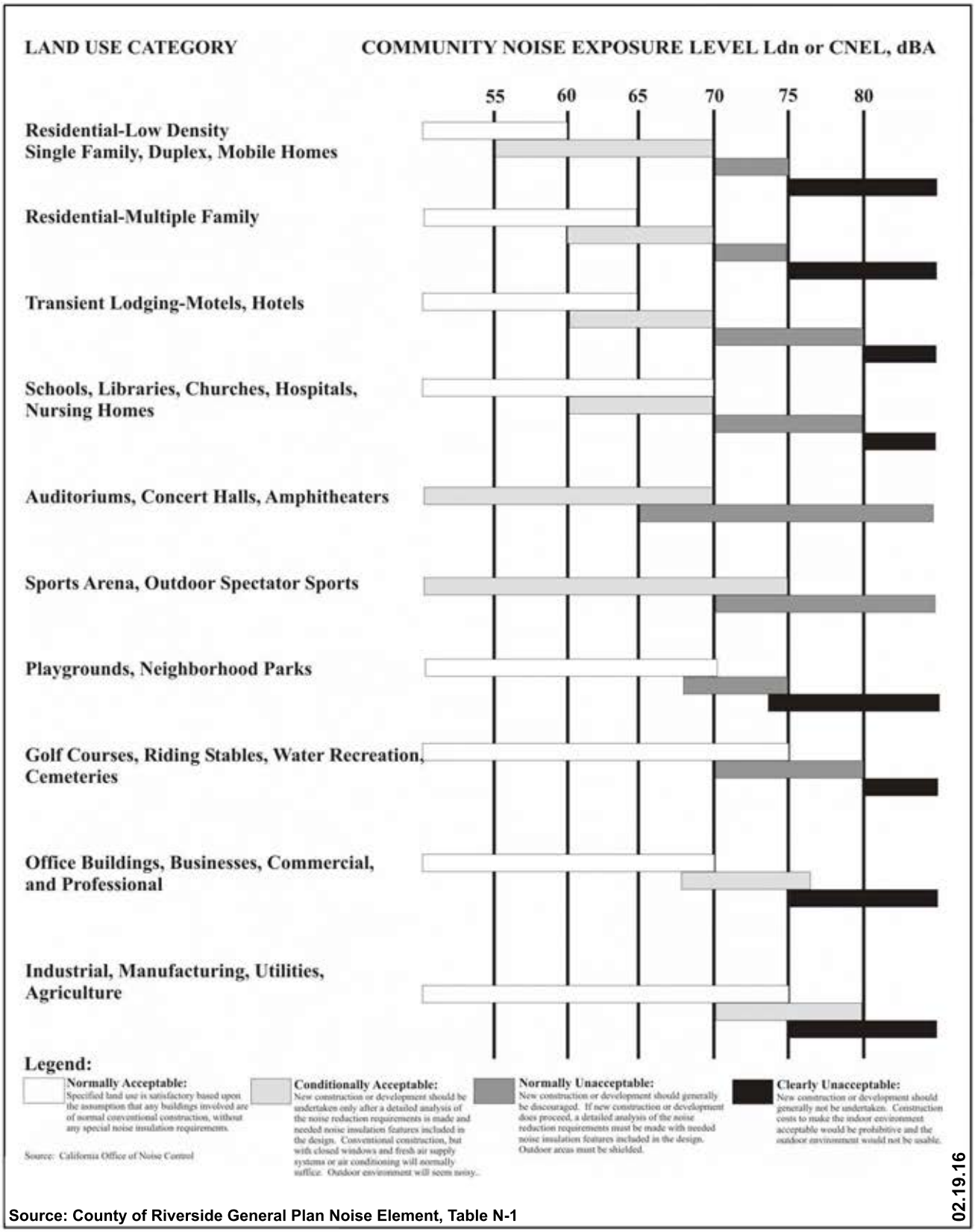
Urban Crossroads, Inc. *CVWD Cr6 Water Treatment Facilities Noise Impact Analysis.* February, 2016.



Source: Urban Crossroads, 2015

Figure 4.13-1

Noise Measurement Location Map



Source: County of Riverside General Plan Noise Element, Table N-1

Figure 4.13-2

Land Use Compatibility for Community Noise Exposure