NOISE& GROUNDBORNE VIBRATION IMPACT ANALYSIS

FOR

COACHELLA AIRPORT BUSINESS PARK PROJECT

CITY OF COACHELLA, CA

NOVEMBER 2024

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INTRODUCTION

This report provides an analysis of noise and groundborne vibration associated with the Coachella Airport Business Park Project (project). This report also provides a summary of existing conditions in the project area and the applicable regulatory framework.

PROPOSED PROJECT SUMMARY

The project is located on an approximate 47.96-acre site comprised of four parcels, (Assessor's Parcel Numbers [APNs] 763-330-013, 763-330-018, 763-330-029) The proposed project site is located within Coachella city limits (City) within Riverside County, California. The proposed project site would be developed for various industrial uses including large and small warehouses, personal vehicle storage, self-storage units, small business uses, a small retail and drive-through restaurant, a billboard sign as well as a fuel station with convenience store. The proposed project would also feature landscaping, parking, lighting, and signage. The main access to the project site would be located at its signalized intersection with Airport Boulevard. The project's site and parcels are depicted in Figure 1. The project's site plan is depicted in Figure 2.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

Amplitude

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

Frequency

Frequency is the number of fluctuations in the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sounds of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, the environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA. Common community noise sources and noise levels are depicted in Figure 3.

Addition of Decibels

Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Figure 1
Project Location & Vicinity

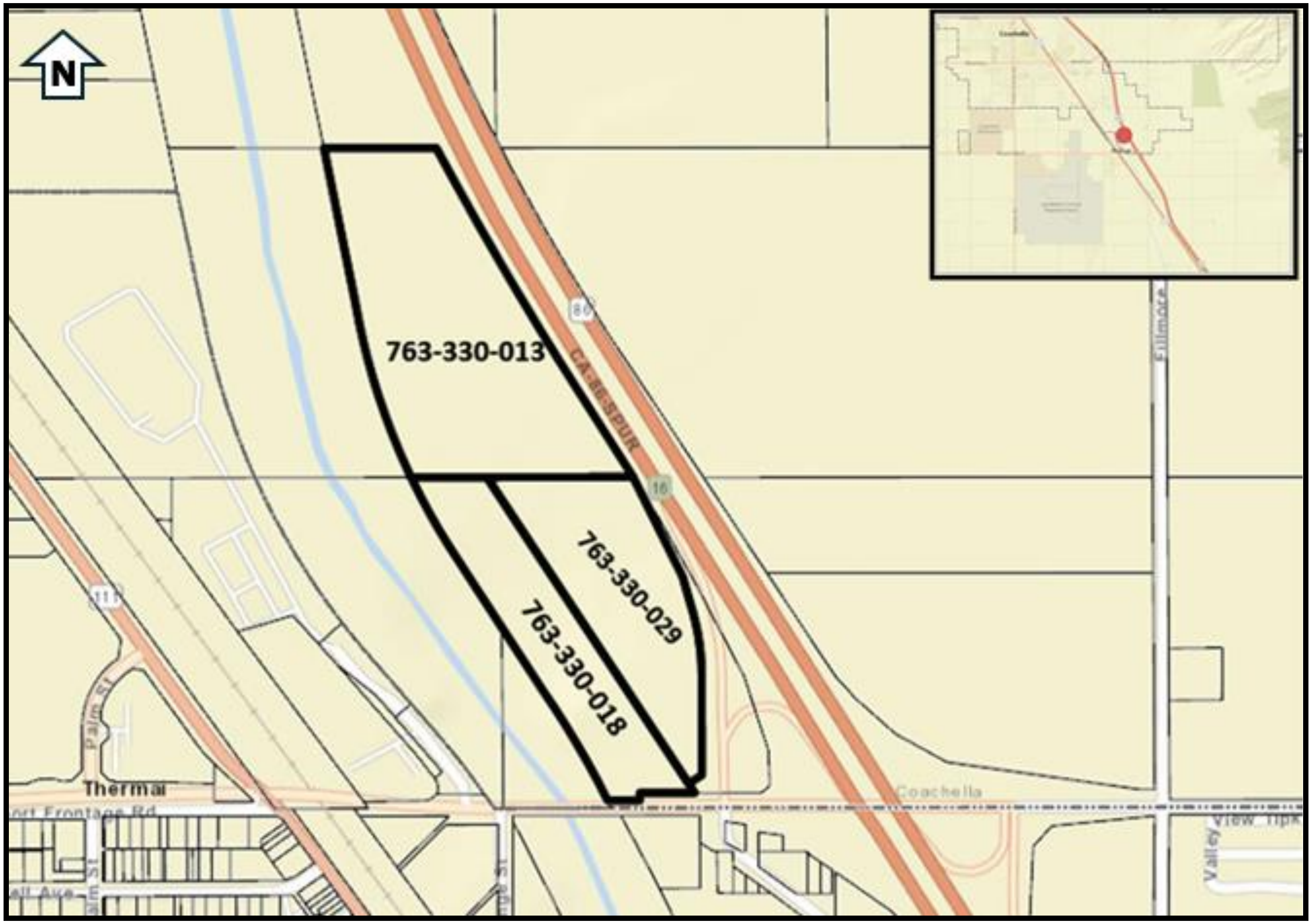


Image Source: Riverside County 2024c
Locations are approximate. Not to Scale

Figure 2
Project Site Plan

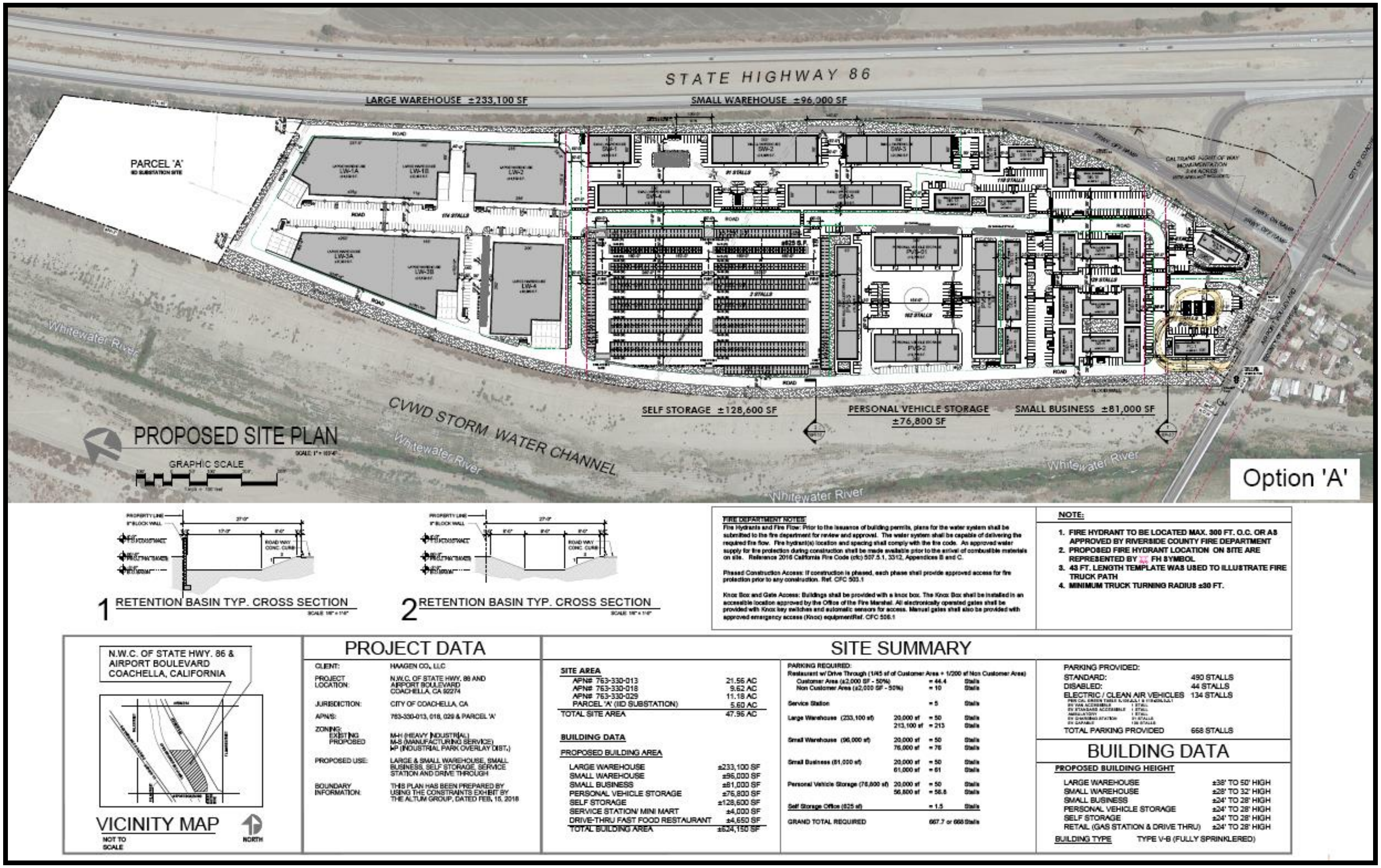
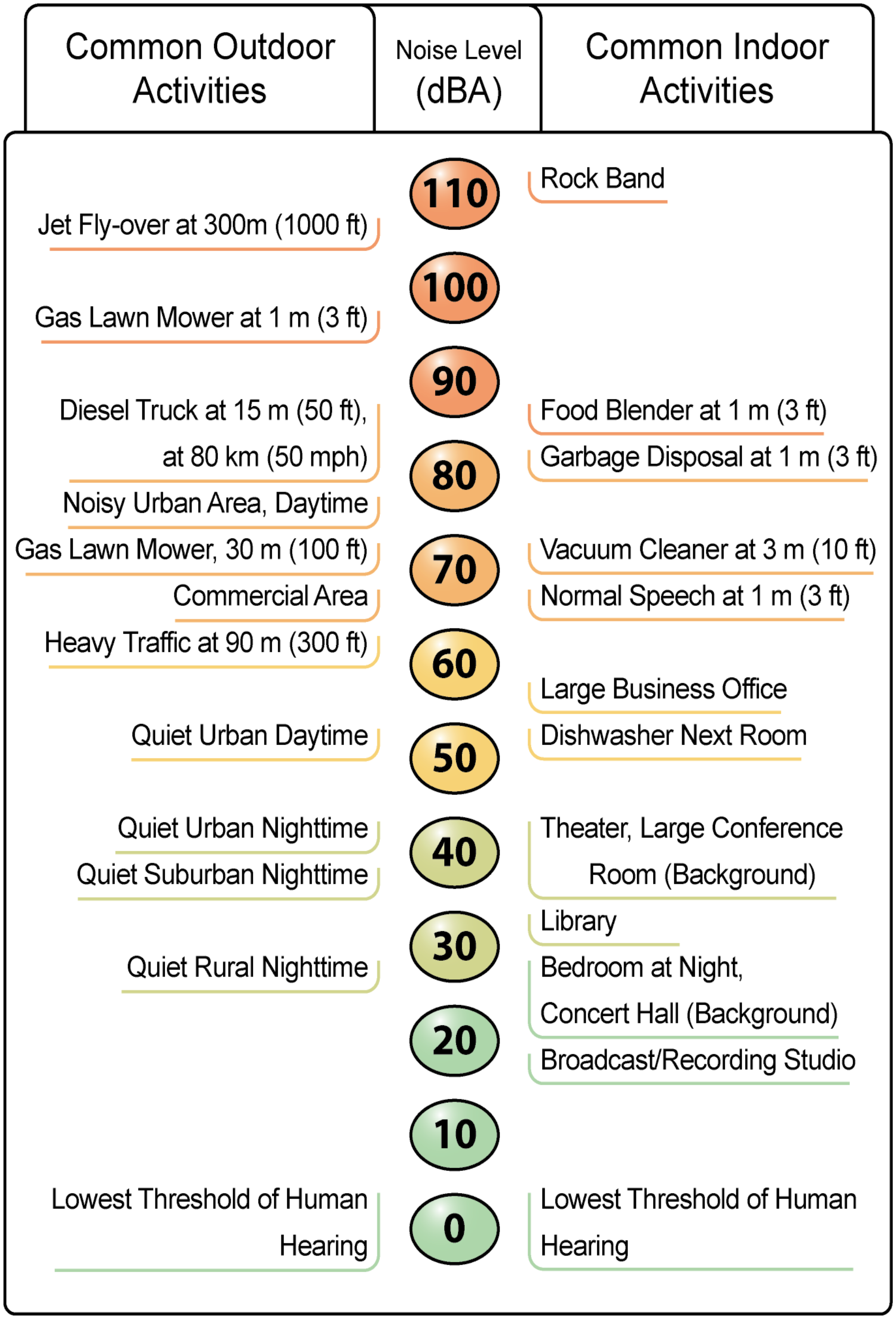


Figure 3
Typical Community Noise Levels



Source: Caltrans 2018

Sound Propagation & Attenuation

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between a line source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 dB per doubling of distance from a line source.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in an approximate 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted noise scale. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise.

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. For the evaluation of environmental noise, the most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10 dBA "penalty" added for nighttime noise (10:00 p.m. to 7:00 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds a 5 dBA penalty for evening noise (7:00 p.m. to 10:00 p.m.) Common noise descriptors are summarized in Table 1.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Table 1
Common Acoustical Terms and Descriptors

Descriptor	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to referenced sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increased sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the L_{dn} described above but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated L_{dn}.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will help understand this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference;
- A change in a level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10 dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on Human Activities

The extent to which environmental noise is deemed to result in increased levels of annoyance, activity interference, and sleep disruption varies greatly from individual to individual depending on various factors, including the loudness or suddenness of the noise, the information value of the noise (e.g., aircraft overflights, a child crying, fire alarm), and an individual's sleep state and sleep habits. Over time, adaptation to noise events and increased levels of noise may also occur. In terms of land use compatibility, environmental noise is often evaluated in terms of the potential for noise events to result in increased levels of annoyance, sleep disruption, or interference with speech communication, activities, and learning.

Speech Communication

For noise-sensitive land uses, interior noise levels of approximately 45-52 dB L_{eq} are typically identified for the protection of speech communication in order to provide 100 percent intelligibility of speech sounds. For the more noise-sensitive interior uses, such as school classrooms and habitable areas of residential dwellings, a background average-hourly noise level of 45 dBA L_{eq} is typically recommended (FHWA 2011, CARB 2016). For other somewhat less noise-sensitive uses, such as daycare centers, meeting rooms, and offices, allowable average-hourly interior noise levels of up to 52 dBA L_{eq} are often recommended (FHWA 2011, Caltrans 2020). For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (U.S. EPA 1974.) Based on this information, speech interference begins to become a problem when steady exterior noise levels reach approximately 60 to 65 dBA.

Annoyance & Sleep Disruption

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978 the research findings of Theodore J. Schultz provided support for L_{dn} as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percentage of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed.

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for the determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels more than 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance.

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against activity interference at most noise-sensitive land uses, including residential dwellings, and would also be sufficient to protect against sleep interference (U.S. EPA, 1974.) Within California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single-family dwellings). Use of the 45 dBA CNEL/L_{dn} threshold is further supported by recommendations provided in the State of California Office of Planning and Research's *General Plan Guidelines* (2017), which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity" (California Office of Planning and Research 2017).

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and trains passing by, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of single-event noise metrics, such as the SEL descriptor, may be helpful as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact.

Although the use of supplemental noise descriptors can provide an increased understanding of intermittent noise events and their relationship to the cumulative noise metrics, current environmental regulations do not identify quantitative criteria, metrics, or computation methods pertaining to single-event noise exposure for the determination of land use compatibility. However, with regard to aircraft noise exposure, FICAN has provided non-regulatory guidance for estimating the expected percentage of awakenings that may result from single aircraft noise events. For example, at an indoor sound exposure of SEL 80 dBA, the FICAN data indicates that approximately 10 percent of exposed individuals would be awakened. Although some estimates of the percentage of people expected to be awakened when exposed to specific single-event noise levels inside a home have been provided, no quantitative determination as to what frequency of awakening would be acceptable has been made by Federal, State, or local entities. Although no quantitative thresholds have yet been identified with regard to single-event noise exposure, the indication from several studies is that the noise threshold for significant occurrence of sleep disruption is higher than for speech interference.

EXISTING SETTING

Ambient Noise Environment

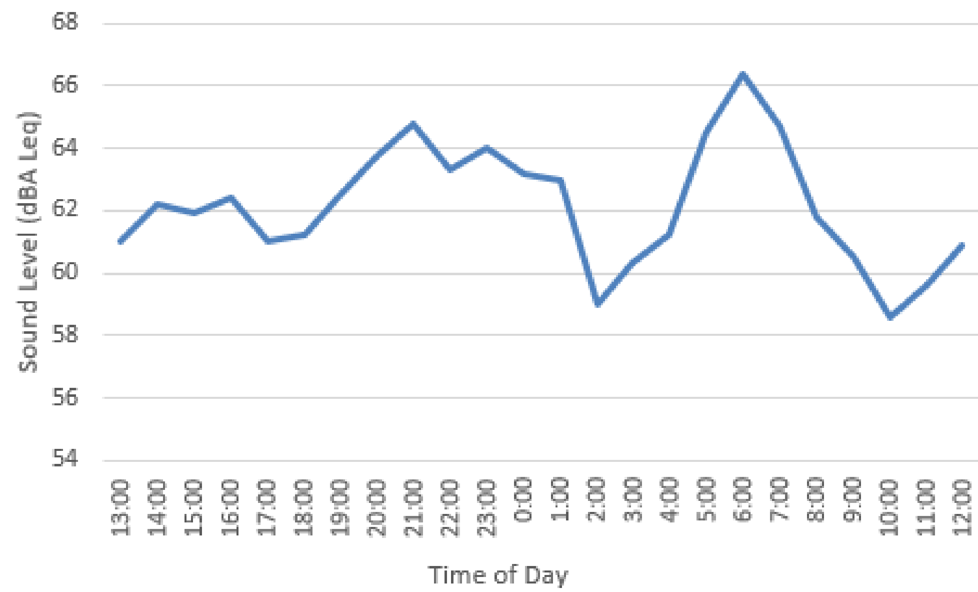
To document the existing noise environment in the project vicinity, three short-term (i.e., 10-minutes) noise measurements were conducted on January 10th, 2024, using a SoftdB Piccolo, Type 2, sound-level meter. Measurement locations are depicted in Figure 4. As noted in Table 2, measured short-term daytime average-hourly noise levels in the project area generally range from the low to high 60's (dBA L_{eq}), depending largely on distance from area roadways.

Table 2
Short-Term Noise Measurement Data

Measurement Location	Measurement Time Period	Measurement Location Description	Major Noise Sources	Noise Level (dBA)	
				L_{eq}	L_{max}
ST1	2:12 – 2:22	Western Project Site Boundary across from Rucker Homestead	Warehouse operational noise and traffic	60	71.4
ST2	2:27 – 2:37	Southern Project Site Boundary	Traffic, primarily light-duty auto with occasional heavy-duty auto	67.7	79.4
ST3	2:43 – 2:53	Desert Cactus Drive and Airport Blvd Intersection	Traffic, primarily light-duty auto with occasional heavy-duty auto	62.5	77.4
Noise measurements were conducted on January 10, 2024, using a Piccolo 2 sound-level meter. Refer to Figure 4 for measurement locations.					

A long-term measurement (LT1) (i.e., 24-hours) was conducted from October 22nd to October 23rd, using a SoftdB Piccolo, Type 2, integrating sound-level meter. The meter was calibrated before use and is certified to comply with Acoustical National Standards Institute (ANSI) specifications. The long-term noise measurement was conducted along the southern boundary of the project site. Measured ambient noise levels for LT1 are summarized in Table 3. The long-term noise measurement locations is depicted in Figure 4.

Table 3
Long-Term Measurement 1



Measurement Hour	Noise Level (L_{eq} dBA)
13:00	61
14:00	62
15:00	62
16:00	62
17:00	61
18:00	61
19:00	63
20:00	64
21:00	65
22:00	63
23:00	64
0:00	63
1:00	63
2:00	59
3:00	60
4:00	61
5:00	65
6:00	**66**
7:00	65
8:00	62
9:00	61
10:00	59
11:00	60
12:00	61
CNEL	69.5

Note: Highest noise hour is in bold

Based on the measurements conducted, daytime average-hourly noise levels in the project vicinity ranged from the high 50s to the high 60s (in dBA L_{eq}). The Measured average daily noise level at the project site were 69.5 dBA CNEL. Ambient noise levels within the project area are predominantly influenced by vehicle traffic on area roadways.

Figure 4
Noise Measurement Locations

Image Source: Riverside County 2024c
Locations are approximate. Not to Scale

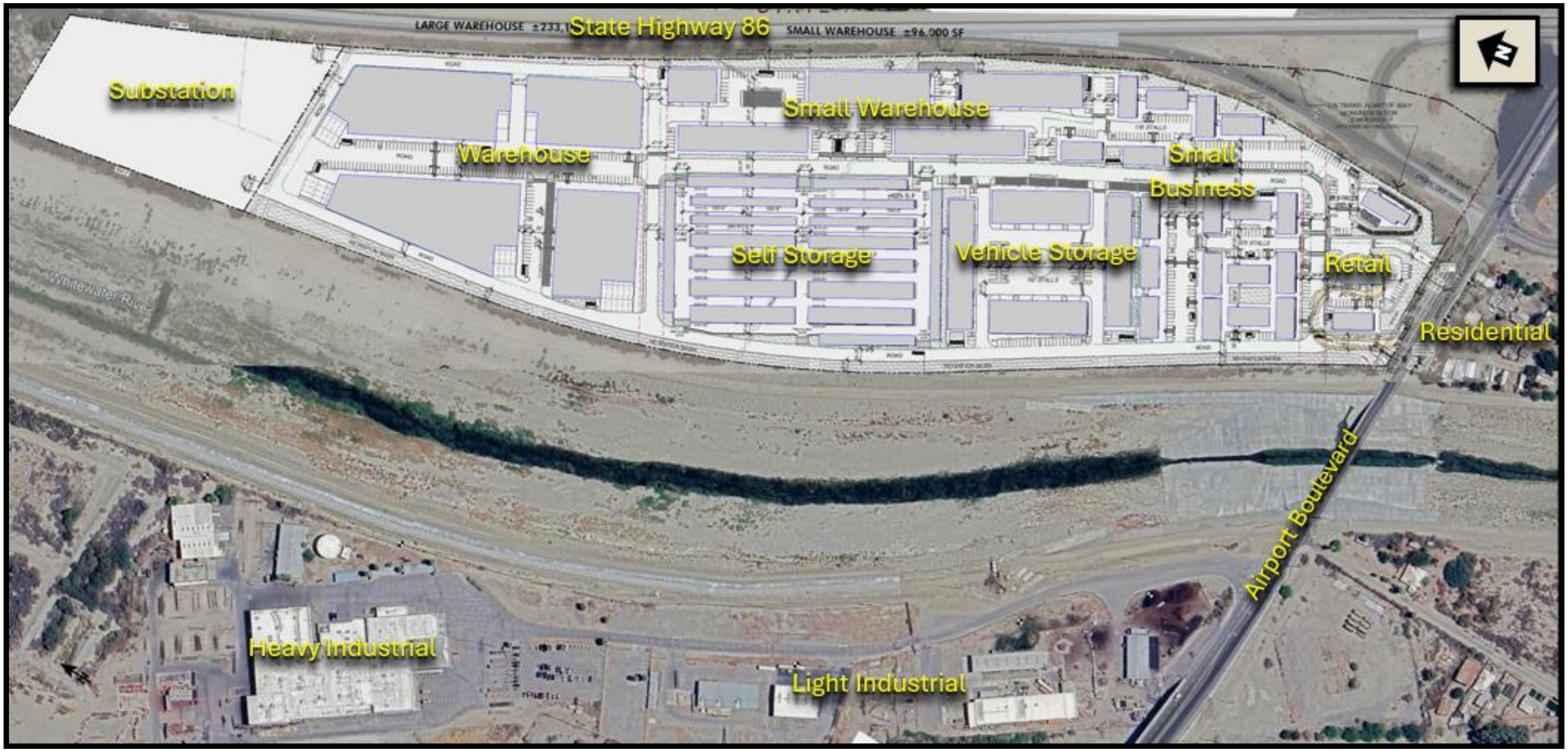
Noise-Sensitive Receptors

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. Noise-sensitive land uses in the project vicinity consist of residential land uses. The nearest residential land uses are located south of the proposed project site, across Airport Boulevard within Riverside County. Nearby noise-sensitive land uses are depicted in Figure 5.

Groundborne Vibration

No major existing sources of groundborne vibration were identified in the project area. Vehicle traffic on area roadways, particularly heavy-duty trucks, can result in increased groundborne vibration. However, groundborne vibration levels associated with vehicle traffic are typically considered minor and would not exceed applicable criteria at the project site boundaries.

Figure 5
Nearby Existing and Proposed Land Uses



Locations are approximate. Not to Scale

REGULATORY FRAMEWORK

Noise

County of Riverside General Plan

The County of Riverside General Plan provides a systematic approach to quantifying and identifying noise problems within the county. The Noise Element addresses excessive noise exposure and guides community planning for the regulation of noise. Applicable policies are summarized below (Riverside County 2015):

Noise Compatibility

N 1.2 Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors or within the projected noise contours of any adjacent airports.

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- Schools.
- Hospitals.
- Rest Homes.
- Long Term Care Facilities.
- Mental Care Facilities.
- Residential Uses.
- Libraries.
- Passive Recreation Uses.
- Places of Worship.

According to the State of California Office of Planning and Research General Plan Guidelines, an acoustical study may be required in cases where these noise-sensitive land uses are located in an area of 60 CNEL or greater. Any land use that is exposed to levels higher than 65 CNEL will require noise attenuation measures.

N 1.4 Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys.

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.

N 1.7 Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

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.

Noise Mitigation Strategies

N 2.1 Create a County Noise Inventory to identify major noise generators and noise-sensitive land uses, and to establish appropriate noise mitigation strategies.

N 2.2 Require a qualified acoustical specialist to prepare acoustical studies for proposed noise-sensitive projects within noise-impacted areas to mitigate existing noise.

N 2.3 Mitigate exterior and interior noises to the levels listed in Table 4 below to the extent feasible, for stationary sources:

Table 4.
Stationary Source Land Use Noise Standards[1]

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

1 These are only preferred standards; the Riverside County Planning Department and Office of Public Health will make final decision.
Source: Riverside County 2015

Community Noise Inventory

N 4.1 Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels:

a. 45 dBA-10-minute Leq between 10:00 p.m. and 7:00 a.m.

b. 65 dBA-10-minute Leq between 7:00 a.m. and 10:00 p.m.

Temporary Construction

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices.

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see Policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

a. Temporary noise attenuation fences;

b. Preferential location of equipment; and

c. Use of current noise suppression technology and equipment.

N 13.4 Require that all construction equipment utilizes noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

County of Riverside Municipal Code

Title 9-Public Peace, Morals, and Welfare, Chapter 9.52-Noise Regulation of the County's Municipal Code is intended to establish county-wide standards regulating noise. Chapter 9.52-Noise Regulation specifies daytime and nighttime noise standards for various land uses. As per the County's Municipal Code, "No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 5" (Riverside County 2024a). Applicable policies are summarized below:

Construction activities are exempt from these standards if they comply with hourly restrictions based on the time of year. Noise emanating from private construction projects located within one-quarter of a mile of an inhabited dwelling are exempt provided:

- Construction does not occur between the hours of 6 p.m. and 6 a.m. during the months of June through September, and
- Construction does not occur between the hours of 6 p.m. and 7 a.m. during the months of October through May;

Table 5
Sound Level Standards

GENERAL PLAN FOUNDATION COMPONENT	GENERAL PLAN LAND USE DESIGNATION	GENERAL PLAN LAND USE DESIGNATION NAME	DENSITY	MAXIMUM DECIBEL LEVEL	
				7 am—10 pm	10 pm—7 am
Community Development	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
	MDR	Medium Density Residential	2—5	55	45
	MHDR	Medium High Density Residential	5—8	55	45
	HDR	High Density Residential	8—14	55	45
	VHDR	Very High Density Residential	14—20	55	45
	H'TDR	Highest Density Residential	20+	55	45
	CR	Retail Commercial		65	55
	CO	Office Commercial		65	55
	CT	Tourist Commercial		65	55
	CC	Community Center		65	55
	LI	Light Industrial		75	55
	HI	Heavy Industrial		75	75
	BP	Business Park		65	45
	PF	Public Facility		65	45
	SP	Specific Plan-Residential		55	45
		Specific Plan-Commercial		65	55
		Specific Plan-Light Industrial		75	55
		Specific Plan-Heavy Industrial		75	75
Rural Community	EDR	Estate Density Residential	2 AC	55	45
	VLDR	Very Low Density Residential	1 AC	55	45
	LDR	Low Density Residential	1/2 AC	55	45
Rural	RR	Rural Residential	5 AC	45	45
	RM	Rural Mountainous	10 AC	45	45
	RD	Rural Desert	10 AC	45	45
Agriculture	AG	Agriculture	10 AC	45	45
Open Space	C	Conservation		45	45
	CH	Conservation Habitat		45	45
	REC	Recreation		45	45
	RUR	Rural	20 AC	45	45
	W	Watershed		45	45
	MR	Mineral Resources		75	45

Source: Riverside County 2024a.

City of Coachella General Plan

The noise element contained within the Coachella general plan aims to identify noise sources that exist within the City and establish guiding policies to address their potential impacts through both preventative and responsive measures. Applicable goals and policies contained within the City's General Plan Noise element include are provided below (City of Coachella 2015):

Goal 1. Land Use Planning and Design. A community where noise compatibility between differing types of land uses is ensured through land use planning and design strategies.

Policies:

1.1 Noise Compatibility. Use the City's Land Use/Noise Compatibility Matrix shown in Figure 6 as a guide for planning and development decisions.

1.2 Noise Analysis and Mitigation. Require projects involving new development or modifications to existing development to implement mitigation measures, where necessary, to reduce noise levels to at least the normally compatible range shown in the City's Land Use/Noise Compatibility Matrix in Figure 6. Mitigation measures should focus on architectural features, building design, and construction, rather than site design features such as excessive setbacks, berms, and sound walls, to maintain compatibility with adjacent and surrounding uses.

1.3 Mixed Use. Require mixed-use structures and areas be designed to prevent transfer of noise from commercial uses to residential uses and ensure a 45 dBA CNEL level or lower for all interior living spaces.

1.4 County and Regional Plans. Periodically review county and regional plans for transportation facilities and airport operation, to identify and mitigate the potential impact of noise on future development.

1.5 Airport Land Use Planning. Comply with all applicable policies contained in the Riverside County General Plan Noise Element relating to airport noise, including those policies requiring compliance with the airport land use noise compatibility criteria contained in the airport land use compatibility plan for Jacqueline Cochran Regional Airport; and those policies prohibiting new residential land uses, except construction of single-family dwellings on legal residential lots of record, within the 60 dB CNEL contour of this airport.

1.6 Land Use and Community Design. Except in cases where noise levels are in the clearly incompatible range as shown in the City's Land Use/Noise Compatibility Matrix shown in Figure 6, prioritize the building design and character policies in the Land Use and Community Design Element over those in the Noise Element to ensure that new development meets the design vision of the City.

Goal 2. Stationary Source Noise. A community where excessive noise from stationary sources is minimized.

Policies

2.1 Noise Ordinance. Minimize noise conflicts between neighboring properties through enforcement of applicable regulations such as the City's noise ordinance.

2.2 Noise Control. Minimize stationary noise impacts on sensitive receptors and noise emanating from construction activities, private developments/residences, landscaping activities, night clubs and bars and special events.

2.3 Industrial Uses. Require industrial uses engage in responsible operational practices that minimize noise impacts on adjacent residences and other noise-sensitive receptors require mitigation as needed for development of industrial uses near noise sensitive receptors.

Goal 3. Mobile Source Noise. A community where excessive noise from mobile sources is minimized.

Policies

3.1 Roadway Noise. Where roadway noise exceeds the normally compatible range shown in the City's Land Use/Noise Compatibility Matrix shown in Figure 6, implement policies listed under Goal 1 to reduce the impacts of roadway noise on noise-sensitive receptors.

3.2 Traffic Calming. Where roadway noise exceeds the normally compatible range shown in the City's Land Use/Noise Compatibility Matrix shown in Figure 6, consider the implementation of traffic calming measures such as reduced speed limits or roadway design features to reduce noise levels through reduced vehicle speeds and/or diversion of vehicle traffic.

Figure 6
Land Use Compatibility for Community Noise Exposure

LAND USE CATEGORIES		CNEL						
CATEGORIES	USES	55	60	65	70	75	80	
RESIDENTIAL	Single Family, Duplex, Multiple Family	Green	Green	Yellow	Yellow	Orange	Red	Red
RESIDENTIAL	Mobile Homes	Green	Green	Yellow	Orange	Orange	Red	Red
COMMERCIAL - Regional, District	Hotel, Motel, Transient Lodging	Green	Green	Yellow	Yellow	Orange	Orange	Red
COMMERCIAL - Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theater	Green	Green	Green	Green	Yellow	Yellow	Orange
COMMERCIAL INDUSTRIAL	Office Building, Research and Development, Professional Offices, City Office Building	Green	Green	Green	Yellow	Yellow	Orange	Red
COMMERCIAL - Recreation INSTITUTIONAL - Civic Center	Amphitheater, Concert Hall Auditorium, Meeting Hall	Yellow	Yellow	Orange	Orange	Red	Red	Red
COMMERCIAL - Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	Green	Green	Green	Yellow	Yellow	Red	Red
COMMERCIAL - General, Special INDUSTRIAL, INSTITUTIONAL	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	Green	Green	Green	Green	Yellow	Yellow	Yellow
INSTITUTIONAL - General	Hospital, Church, Library, School Classroom	Green	Green	Yellow	Orange	Orange	Red	Red
OPEN SPACE	Parks	Green	Green	Green	Yellow	Orange	Red	Red
OPEN SPACE	Golf Couse, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	Green	Green	Green	Green	Yellow	Orange	Orange
AGRICULTURE	Agriculture	Green	Green	Green	Green	Green	Green	Green

INTERPRETATION

ZONE A (GREEN) CLEARLY COMPATIBLE	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.
ZONE B (YELLOW) NORMALLY COMPATIBLE	New construction or development should be undertaken only after an analysis of the noise reduction requirements is made and needed noise insulation features included in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice.
ZONE C (ORANGE) NORMALLY INCOMPATIBLE	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
ZONE D (RED) CLEARLY INCOMPATIBLE	New construction or development should generally not be undertaken.

* Construction of new residential uses will not be allowed within the 65 dBA CNEL contour for airport noise.

Source: Coachella 2015

City of Coachella Municipal Code

The City's Noise Control Ordinance is contained in the Municipal Code, Title 7 Chapter 7.04. The Coachella Municipal Code established sound level limits as related to fixed noise sources. Sound level limits within the City are based on 10-minute sound level averages (L_{eq}) and are shown below in Table 6. Residential land uses have a daytime standard of 55 dBA L_{eq} and a nighttime standard of 45 dBA L_{eq}. Commercial land uses have a daytime standard of 65 dBA L_{eq} and a nighttime standard of 55 dBA L_{eq} (Coachella 2024).

Construction activities are limited based on the time of year. Between October 1st and April 30th construction during weekdays is limited to the hours of 6:00 am to 5:30 pm and from 8:00 am to 5:00 pm on weekends and holidays. From May 1st to September 30th construction is limited to the hours of 5:00 am to 7:00 pm on weekdays and from 8:00 am to 5:00 pm on weekends and holidays.

Table 6
Stationary Source Land Use Noise Standards

Land Use	Time	Applicable Ten-Minute Average Decibel Limit
Residential	6:00 a.m. – 10:00 p.m. 10:00 p.m. – 6:00 a.m.	55 45
Commercial	6:00 a.m. – 10:00 p.m. 10:00 p.m. – 6:00 a.m.	65 55

If the measured ambient noise level exceeds the applicable limit the allowable average sound level shall be the ambient noise level. The ambient noise level shall be measured when the alleged noise violation sources are not operating.
Source: Coachella 2024

Groundborne Vibration

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of amplitude and frequency. A person's perception of the vibration will depend on their sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating. Vibration can be measured in terms of acceleration, velocity, or displacement. Measurements in terms of velocity are expressed as peak particle velocity (PPV) with units of inches per second (in/sec).

The California Department of Transportation (Caltrans) has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in Table 7. The criteria apply to continuous vibration sources, which include vehicle traffic and most construction activities. All damage criteria for buildings are in terms of ground motion at the buildings' foundations. No allowance is included for the amplifying effects of structural components (Caltrans 2020).

Table 7
Summary of Groundborne Vibration Levels and Potential Effects

Vibration Level (in/sec ppv)	Human Reaction	Effect on Buildings
0.006 - 0.019	Threshold of perception; possibility of intrusion.	Vibrations unlikely to cause damage of any type.
0.08	Vibrations readily perceptible.	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected.
0.10	Level at which continuous vibrations begin to annoy people.	Virtually no risk of "architectural" damage to normal buildings.
0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relatively short periods of vibrations).	Threshold at which there is a risk of "architectural" damage to fragile buildings.
0.3 - 0.6	Vibrations become distinctly perceptible at 0.4 in/sec ppv and considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.	Potential risk of "architectural" damage may occur at levels above 0.3 in/sec ppv for older residential structures and above 0.5 in/sec ppv for newer structures.

The vibration levels are based on peak particle velocity in the vertical direction for continuous vibration sources, which includes most construction activities.
Source: Caltrans 2020

As indicated in Table 7, the threshold at which there is a risk to normal structures from continuous events is 0.3 in/sec PPV for older residential structures and 0.5 in/sec PPV for newer building construction. No existing historic or fragile structures were identified in the project area. With regard to human perception, vibration levels would begin to become distinctly perceptible at levels of 0.4 in/sec PPV for continuous events. Continuous vibration levels are considered potentially annoying for people in buildings at levels of 0.2 in/sec PPV.

IMPACT ANALYSIS

Standards of Significance

Criteria for determining the significance of noise and vibration impacts were developed based on information contained in the California Environmental Quality Act (CEQA) Guidelines (Appendix G). According to those guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or
2. Generation of excessive groundborne vibration or groundborne noise levels; or
3. Located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or private-use airport, that exposes people residing or working in the project area to excessive noise levels.

It is important to note that no standardized criteria have been developed by the State of California, County of Riverside, or City of Coachella, for assessing construction noise impacts. However, the Federal Transit Administration (FTA) has identified criteria for the assessment of construction-generated noise levels. For noise-sensitive land uses, the FTA's recommended detailed analysis of construction noise identifies daytime and nighttime noise standards of 80 dBA L_{eq} and 70 dBA L_{eq}, respectively (FTA 2018). These thresholds are based on an 8-hour average. To be conservative, these daytime and nighttime standards have been applied on an hourly basis. For the purpose of this analysis, construction-generated noise levels at nearby noise-sensitive receptors that exceed the daytime and nighttime thresholds of 80 and 70 dBA L_{eq}, respectively, would be considered to have a potentially significant impact.

Nearby existing land uses are located within the County. Therefore, operational source noise levels were compared to the applicable standards contained within the County of Riverside Municipal Code (Refer to Table 5). The County's municipal code standards are slightly more conservative than the County's general plan standards, as well as the City's municipal code standards. For the purpose of this analysis operational noise levels at nearby land uses that would exceed applicable County stationary source standards in Table 5 would be considered to have a potentially significant impact.

It is important to note that the CEQA Guidelines do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." As discussed previously in this section, a noise level increase of 3 dBA is barely perceptible to most people, an increase of 5 dBA is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. For purposes of this analysis, a substantial increase in ambient noise levels would be defined as an increase of 3 dBA, or greater. Predicted increases in traffic noise levels attributable to the proposed project that would result in a substantial increase in traffic noise levels that would also exceed applicable County noise standards in Table 5 would be considered to have a potentially significant impact. For determination of land use compatibility for proposed land uses, predicted future year roadway traffic noise levels in excess of the City's applicable land use compatibility standards for newly proposed land uses would be considered to have a potentially significant impact (refer to Figure 6).

The CEQA Guidelines also do not define the levels at which groundborne vibration levels would be considered excessive. For this reason, Caltrans' recommended groundborne vibration thresholds were used for the evaluation of impacts based on increased potential for structural damage and human annoyance, as identified in Table 7. For purposes of this analysis, risks of architectural damage (i.e., minor cracking of plaster walls and ceilings) would be considered potentially significant if construction-generated groundborne vibration levels at nearby structures would exceed 0.5 in/sec PPV. Groundborne vibration in excess of 0.2 in/sec PPV would be expected to result in a potential for significant short-term increases in levels of annoyance for occupants of nearby buildings.

Methodology

Construction Noise

Short-term noise impacts associated with construction activities were analyzed based on typical construction equipment noise levels and distances to the nearest noise-sensitive land use. Noise levels were predicted based on representative off-road equipment noise levels derived from the Federal Highway Administration's (FHWA) Roadway Construction Noise Model based on average equipment usage rates and assuming a noise-attenuation rate of 6 dB per doubling of distance from the source. Anticipated construction activity equipment was derived from the air quality emissions modeling conducted for this project. To be conservative, construction-generated noise levels at nearby land uses were calculated assuming that all construction equipment would be operating simultaneously within approximately 50 feet of the nearest project site boundary.

On-Site Operational Noise

Predicted on-site operational noise levels for stationary (non-transportation) noise sources were calculated using SoundPlan, version 9.0, computer program, based on representative noise levels for similar equipment. The locations of stationary noise sources were based on information provided by the project proponent and information derived from the proposed project site plans. The location of equipment at the proposed substation has not yet been determined. To be conservative, equipment associated with the proposed substation was placed along the substation's southern boundary, nearest existing noise-sensitive land uses. Onsite vehicle traffic was derived from the traffic analysis prepared for this project (GTS 2022). Parking lot activity was assigned based on hourly vehicle trip-generation rates and peak-hour onsite trip distribution assigned to the proposed land uses, derived from the traffic analysis prepared for this project (GTS 2022). Loading dock activity assumes that all loading docks would be in use simultaneously. In addition, each loading dock area was also assumed to include exterior mechanical equipment (e.g., compactor, generator). Operational noise levels were calculated for both daytime and nighttime operations, based on hourly operational hours for proposed onsite land use provided by the project proponent. Based on information obtained from the project proponent daytime operations for most onsite land uses, excluding the gas station minimart, would extend from 7:00 am to 9:00 pm. The gas station minimart is anticipated to operate until midnight (Altum Group 2024). The proposed substation was assumed to operate 24-hours per day. To be conservative, predicted stationary-source operational noise levels at the nearest land uses were calculated assuming the maximum representative noise levels identified for onsite noise sources and that all onsite noise sources would be operating simultaneously. In addition, it is also important to note that calculated onsite operational noise levels include onsite vehicle movement within parking areas, truck routes, and at the fast-food drive-through and gas station pumps. Predicted noise levels at nearby land uses were calculated at the nearest receiving property line and do not include shielding for intervening existing barriers. Noise modeling is included in Appendix A.

Off-Site Operational Noise

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Based on the traffic analysis prepared for this project primarily affected roadways attributable to the project would be largely limited to the adjacent section of Airport Blvd. (GTS 2022). The project's contribution to traffic noise levels along Airport Blvd. was determined by comparing the predicted noise levels with and without project-generated traffic.

Predicted onsite traffic noise levels associated with adjacent segments of State Route 86 (SR-86S) and Airport Blvd were compared to the City's general plan standards. For determination of land use compatibility for proposed onsite developments. To be conservative, the compatibility of proposed land uses were evaluated based on future-year traffic conditions derived from the City of Coachella General Plan (City of Coachella 2015), and traffic analysis prepared for this project (Refer to Appendix A). Predicted onsite traffic noise contours are depicted in Figure 6.

Groundborne Vibration

Predicted construction-generated groundborne vibration levels were based on vibration levels and evaluation criteria derived from Caltrans, as noted in Table 7 (Caltrans 2020). Predicted vibration levels are included in Appendix A.

Impacts and Mitigation Measures

Impact Noise-1:	***Generation of a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.***

Short-term Exposure to Construction Noise

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading, excavation, erection) of construction. Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with construction equipment are summarized in Table 8. As noted in Table 8, noise levels generated by individual pieces of construction equipment typically range from approximately 77 to 85 dBA L_{max} at 50 feet. Typical operating cycles may involve 2 minutes of full power, followed by 3 to 4 minutes at lower settings. Average hourly noise levels associated with construction equipment generally range from approximately 72 to 82 dBA L_{eq} at 50 feet (FHWA 2008). Although noise ranges were found to be similar for all construction phases, the grading phase tends to involve the most equipment and is typically the loudest phase (EPA 1971).

Table 8
Typical Construction Equipment Noise Levels

Equipment	Noise Level (dBA at 50 feet)	
	L_{max}	L_{eq}
Backhoes	78	74
Bulldozers	82	78
Compressors	78	74
Cranes	81	73
Concrete Pump Truck	81	74
Drill Rigs	79	72
Dump Trucks	77	73
Excavator	81	77
Generator	81	78
Gradall	83	79
Grader	85	81
Front End Loaders	79	75
Pneumatic Tools	85	82
Pumps	81	78
Rollers	80	73
Scrapers	84	80
Tractor	84	80

Based on measured instantaneous noise levels (L_{max}), average equipment usage rates, and calculated average-hourly (L_{eq}) noise levels derived from the FHWA Road Construction Noise Model (FHWA 2008)

Predicted construction-generated noise levels at the nearest sensitive receptor for each construction phase are provided in Table 9. As noted in Table 9, construction noise levels at the nearest existing residences, which are located approximately 60 feet south of the project site, could reach approximately 89 dBA L_{eq}. Predicted noise levels at these nearest residences would exceed the daytime and nighttime significance thresholds of 80 dBA L_{eq} and 70 dBA L_{eq}, respectively. With regard to residential land uses, noise levels associated with construction activities occurring during the more noise-sensitive evening and nighttime hours are also of increased concern. Because exterior ambient noise levels typically decrease during the evening and nighttime hours, as community activities (e.g., commercial activities, vehicle traffic) decrease, construction activities performed during these more noise-sensitive periods of the day may result in increased annoyance and potential sleep disruption for occupants of nearby residential dwellings. For these reasons, this impact would be considered **potentially significant.**

Table 9
Predicted Construction Noise Levels at the Nearest Sensitive Receptor

Activity[1]	Predicted Noise Level (dBA L_{eq})[2]	Threshold[3] (Daytime/Nighttime)	Exceeds? (Daytime/Nighttime)
Site Preparation	86	80/70	**Yes/Yes**
Grading	89	80/70	**Yes/Yes**
Building Construction	87	80/70	**Yes/Yes**
Paving	87	80/70	**Yes/Yes**

1. Equipment list based on project-specific information refer to appendix A.
2. Assumes the operation of all activity equipment simultaneously.
3. Thresholds derived from FTA Detailed Construction Noise Analysis.
Threshold exceedances bolded

Mitigation Measures

Noise-1: The following measures shall be implemented to reduce short-term construction noise impacts:

a. Construction activities shall be limited to the hours of 7:00 am to 6:00 pm on weekdays and 8:00 am to 5:00 pm on weekends and holidays.
b. Construction equipment shall be properly maintained and equipped with exhaust mufflers and engine shrouds in accordance with manufacturers' recommendations.
c. Construction equipment staging areas shall be located at the furthest distance possible from nearby noise-sensitive land uses.

Significance after Mitigation

Mitigation Measure Noise-1,a would limit the periods during which construction activities would occur to the daytime hours, in accordance with the City of Coachella and County of Riverside hourly restrictions on construction activities. Mitigation Measure Noise-1,b would require the use of exhaust mufflers, and engine shrouds, which would reduce construction noise levels by approximately 10 dBA, or more (U.S. EPA 1971). Mitigation Measure Noise-1,c would require construction equipment staging areas to be located the furthest distance possible from nearby noise-sensitive land uses. Assuming that staging areas were to be located near the northern boundary of the project site, predicted construction-generated noise levels associated with staging activities would be reduced by as much as approximately 32 dBA. With mitigation, predicted construction noise levels at the nearest residential dwellings would be approximately 79 dBA L_{eq}, or less, and would not exceed the applicable daytime noise standard of 80 dBA L_{eq}. For this reason and given that construction activities would be short-term, this impact would be considered **less than significant.**

Long-term Operational Noise Impacts

On-Site Stationary Noise Sources

On-site stationary source noise levels of primary concern would include a drive-thru restaurant, commercial-use HVAC units, warehouse mechanical equipment, commercial-use loading docks, on-site vehicle parking areas, and the electrical substation. Typical noise levels associated with these sources are discussed in further detail below:

Drive-Thru Restaurant

The proposed project includes a drive-thru restaurant located near the southern boundary of the project site. Noise levels associated with drive-thru restaurants would be largely attributable to the operation of the drive-thru speaker box. Based on noise measurement data obtained from similar drive-thru operations, operational noise levels associated with speaker boxes and vehicle idling typically average approximately 55 dBA L_{eq} at 30 feet from the speaker box.

Commercial-Use Air Conditioning Units

Stationary source noise levels associated with the proposed commercial development would be predominantly associated with the use of exterior air conditioning units. Commercial use air conditioning units would be located on rooftop areas and shielded from direct public exposure. Noise levels associated with commercial air conditioning units can range from 60 to 65 dBA L_{eq} at 3 feet.

Warehouse Mechanical Equipment

Noise sources commonly associated with warehouses may include mechanical equipment such as backup power generators, trash compactors, and refrigeration condensing units. Noise levels associated with these types of equipment can vary depending on numerous factors, including equipment size, location, and hours of operation. Based on measurement data obtained from representative equipment, operational noise levels associated with backup power generators can reach levels of approximately 78 dBA L_{eq} at 50 feet (FHWA 2008). Refrigeration condensers and trash compactors can generate noise levels of up to approximately 60 dBA L_{eq} at 50 feet.

Warehouse Loading Docks

The proposed project includes larger warehouses with loading docks located near the northern boundary of the project site (refer to Appendix A). Based on representative noise measurement data obtained from similar warehouse uses, noise levels associated with outdoor loading dock operations and material handling activities can generate noise levels of approximately 65 dBA L_{eq} at 50 feet.

On-Site Parking Areas

The proposed project would include various parking areas dispersed throughout the project site. Noise levels associated with parking lots typically include vehicle operations, the opening and closing of vehicle doors, and the operation of vehicle sound systems. Parking lot noise levels can vary depending on a number of factors, including the number of parking spaces and site design. Proposed onsite parking areas would range in size from approximately 23 to 179 parking spaces. Assuming that all spaces would be accessed over an approximate one-hour period, average-hourly noise levels associated with parking areas of these sizes would range from approximately 49 to 58 dBA L_{eq} at 50 feet (FTA 2019).

Electrical Substation

The proposed project features an electrical substation located within the northern portion of the project site. This Imperial Irrigation District facility would include a 1-25 megavolt ampere (MVA) 92/13.2 kilovolt (kV) transformer and a 92 kV transmission line and distribution system. The proposed utility station would likely also require a cooling system. Noise generated by the electrical substation would be predominantly associated with transformers. To a lesser extent, noise would also be generated by transmission lines, switches, and cooling equipment. Based on data obtained for similar facilities, operational noise levels of a similar-sized electrical substation would range from approximately 60 to 80 dBA L_{eq} at 6 feet (SMUD 2023).

Cumulative On-Site Stationary Noise Sources Impacts

To be conservative operational impacts associated with the stationary sources at nearby land uses were assessed cumulatively, assuming that all onsite noise sources would operate simultaneously. It is important to note that predicted onsite noise levels also include vehicle movement associated with haul trucks traveling to and from the proposed warehouses, as well as, vehicle traffic associated with other onsite land uses (e.g, parking areas, gas station, drive-thru restaurant, site entrances). Predicted noise levels were calculated for daytime and nighttime operations. Based on information obtained from the project proponent daytime operations for most onsite land uses, excluding the gas station minimart, would extend from 7:00 am to 9:00 pm. The gas station is anticipated to operate until midnight (Altum Group 2024).

Predicted cumulative noise levels at nearby land uses are summarized in Table 10. Predicted noise level contours associated with project operation during the daytime hours and nighttime hours are depicted in

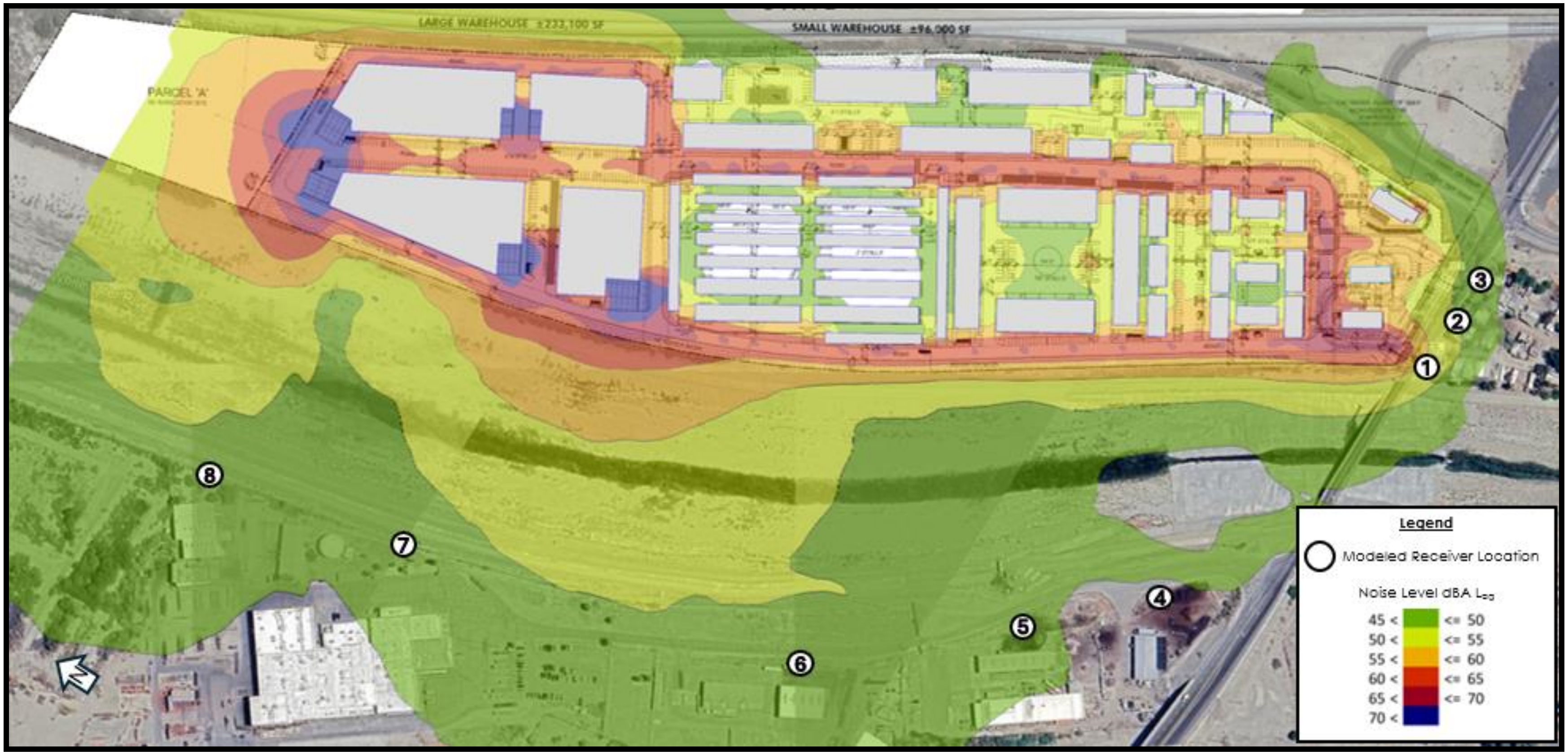
Figures 7 and 8, respectively. As noted in Table 10 and depicted in Figures 7 and 8, predicted cumulative noise levels would not exceed applicable County daytime or nighttime noise standards. As a result, this impact would be considered ***less than significant.***

Table 10
Cumulative Noise Levels at Nearby Noise Sensitive Receptors

Receiver[1]	Land use Type[2]	Predicted Daytime Noise Level (dBA L_{eq})[3]	Predicted Nighttime Noise Level (dBA L_{eq})[4]	Standard[5] (Daytime/Nighttime)	Exceeds? (Daytime/Nighttime)
1	Residential	54	44	55/45	No/No
2	Residential	50	43	55/45	No/No
3	Residential	48	41	55/45	No/No
4	Light Industrial	44	27	75/55	No/No
5	Light Industrial	46	23	75/55	No/No
6	Heavy Industrial	48	21	75/75	No/No
7	Heavy Industrial	49	36	75/75	No/No
8	Heavy Industrial	49	37	75/75	No/No

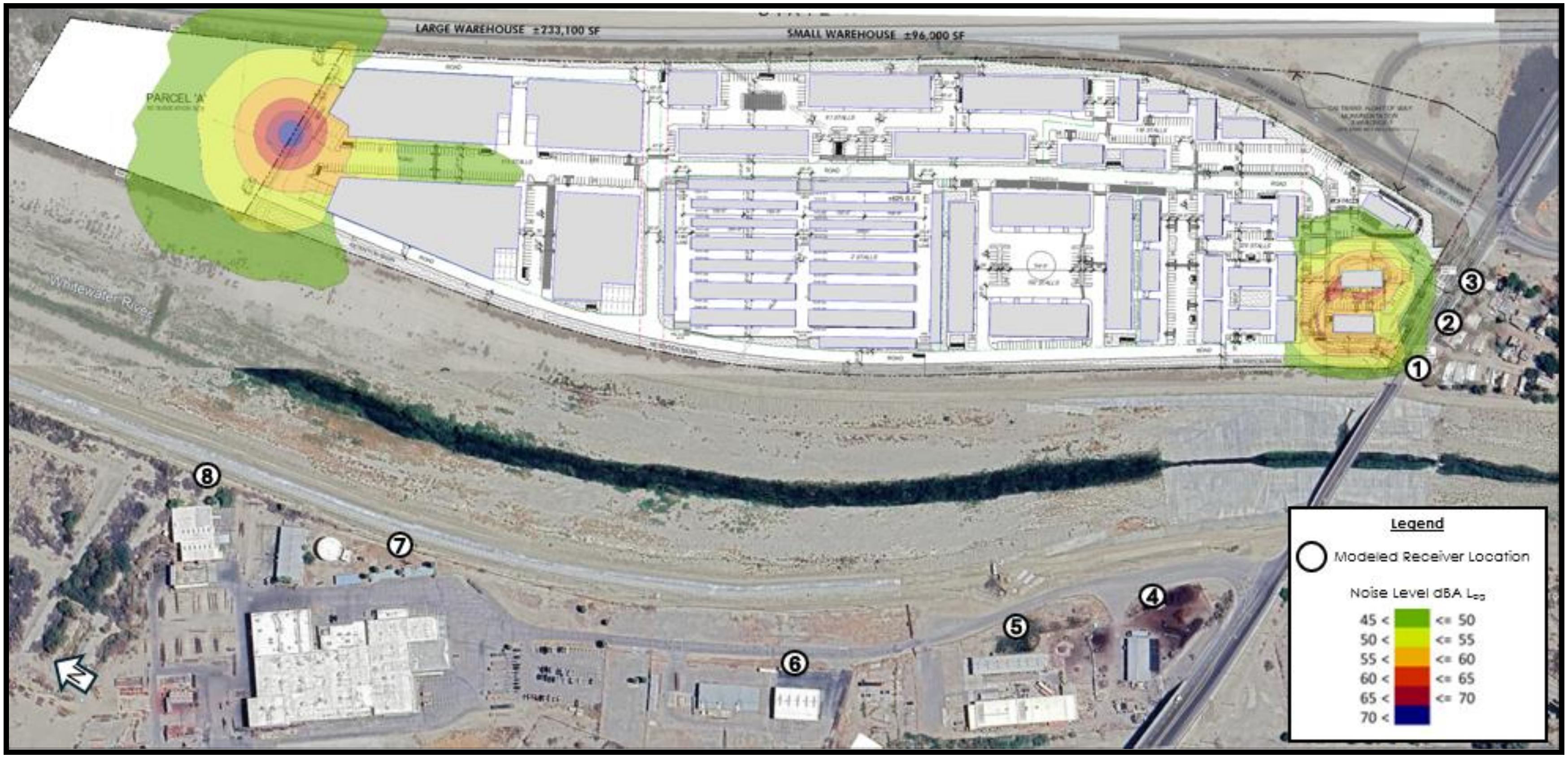
1. Refer to Figures 7 and 8 for receiver locations.
2. Refer to Figure 5 for nearby land uses.
3. Daytime operation includes noise sources associated with all proposed land uses.
4. Nighttime operation includes noise sources associated with the proposed minimart gas station.
5. Applicable County noise standard, refer to Table 5.
Threshold exceedances bolded

Figure 7
Daytime Operational Noise Contours and Modeled Receiver Locations



Refer to Table 10 for Modeled Reciever noise levels

Figure 8
Nighttime Operational Noise Contours and Modeled Receiver Locations



Refer to Table 10 for Modeled Reciever noise levels

Long-term Exposure to Increased Roadway Traffic Noise

Predicted opening year 2027 traffic noise levels and increases associated with the implementation of the proposed project are summarized in Table 11. As depicted, implementation of the proposed project would result in predicted increases in existing traffic noise levels of approximately 0.8 dBA CNEL/L_{dn}, or less. As noted earlier in this report, perceptible changes in ambient noise levels do not typically occur at levels below 3 dBA.

Table 11
Predicted Increases in Opening Year 2027 Traffic Noise Levels

Roadway Segment	Predicted CNEL/L_{dn}, 50 Feet from Near-Travel Lane Centerline			
	Without Project	With Project	Predicted Change	Significant Increase?
Airport Boulevard (SR-86 SB Ramps to SR-86 NB Ramps)	61.1	61.9	0.8	**No**
Airport Boulevard (SR-86 SB Ramps to Project Driveway)	62.1	62.9	0.8	**No**
Airport Boulevard (Project Driveway to Palm Street)	61.4	61.8	0.4	**No**
Airport Boulevard (Palm Street to Polk Street)	60.9	61.1	0.2	**No**

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on data obtained from the traffic analysis prepared for this project. Predicted changes may not sum up due to rounding.
Significant increase is defined as an increase of 3 dBA, or greater.

Predicted future year 2030 traffic noise levels, with and without the project, are summarized in Table 12. As noted in Table 12. predicted increases in the future year 2030 traffic noise levels along area roadways with the implementation of the proposed project would be approximately 0.2 dBA CNEL/L_{dn} or less. Increases in traffic noise along other area roadways would be less. Implementation of the proposed project would not result in a significant increase (i.e., 3 dBA or greater) along area roadways that would exceed applicable standards.

Table 12
Predicted Increases in Future Year 2030 Traffic Noise Levels

Roadway Segment	Predicted CNEL/L_{dn}, 50 Feet from Near-Travel Lane Centerline			
	Without Project	With Project	Predicted Change	Significant Increase?
Airport Boulevard (SR-86 SB Ramps to SR-86 NB Ramps)	62.6	62.8	0.2	**No**
Airport Boulevard (SR-86 SB Ramps to Project Driveway)	63.5	63.6	0.2	**No**
Airport Boulevard (Project Driveway to Palm Street)	62.4	62.5	0.1	**No**
Airport Boulevard (Palm Street to Polk Street)	61.8	61.8	0.0	**No**

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on data obtained from the traffic analysis prepared for this project. Predicted changes may not sum up due to rounding.
Significant increase is defined as an increase of 3 dBA, or greater.

Predicted future year 2045 traffic noise levels, with and without the project, are summarized in Table 13. As noted in Table 13. predicted increases in the future year 2045 traffic noise levels along area roadways with the implementation of the proposed project would be approximately 0.2 dBA CNEL/L_{dn} or less. Increases in traffic noise along other area roadways would be less. Implementation of the proposed project would not result in a significant increase (i.e., 3 dBA or greater) along area roadways that would exceed applicable standards.

Table 13
Predicted Increases in Future Year 2045 Traffic Noise Levels

Roadway Segment	Predicted CNEL/L_{dn}, 50 Feet from Near-Travel Lane Centerline			
	Without Project	With Project	Predicted Change	Significant Increase?
Airport Boulevard (SR-86 SB Ramps to SR-86 NB Ramps)	63.4	63.5	0.1	**No**
Airport Boulevard (SR-86 SB Ramps to Project Driveway)	64.1	64.3	0.2	**No**
Airport Boulevard (Project Driveway to Palm Street)	63.0	63.0	0	**No**
Airport Boulevard (Palm Street to Polk Street)	62.4	62.4	0	**No**

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on data obtained from the traffic analysis prepared for this project. Predicted changes may not sum up due to rounding.
Significant increase is defined as an increase of 3 dBA, or greater.

Implementation of the proposed project would not result in significant increases in either near-term or future traffic noise levels along area roadways that would exceed applicable standards. For this reason, this impact would be considered **less than significant**.

Compatibility of Proposed Land Uses

The compatibility of proposed land uses was evaluated based on predicted future year onsite traffic noise conditions for the adjacent segments of SR-86S and Airport Boulevard. Future year traffic volumes for SR-86S were derived from the City of Coachella General Plan (City of Coachella 2015). Future year traffic volumes for Airport Boulevard were derived from the traffic analysis prepared for this project. Predicted future-year traffic noise levels and distance to traffic noise contours are summarized in Table 14 and depicted in Figure 9.

As noted in Figure 6, the City's "Clearly Compatible" noise standards are 65 dBA CNEL/L_{dn} for office uses and 70 dBA CNEL/L_{dn} for commercial and industrial uses. Based on the traffic noise modeling conducted for future year conditions, predicted onsite traffic noise levels would range from approximately 68 to 75 dBA CNEL/L_{dn}. In comparison to the City's land use compatibility noise standards, predicted exterior noise levels at some proposed onsite office, and warehouse land uses would exceed the City's "Clearly Compatible" noise standards of 65 and 70 dBA CNEL/L_{dn} respectively (refer to Table 14). Predicted noise levels at these land uses would, however, fall within the "Normally Compatible" range. As per the City's General Plan construction of land uses within the "Normally Compatible" range shall only be undertaken after "an analysis of the noise reduction requirements is made and needed noise insulation features included in the design are determined. Conventional construction with closed windows and fresh air supply systems or air conditioning will normally suffice." (City of Coachella 2015).

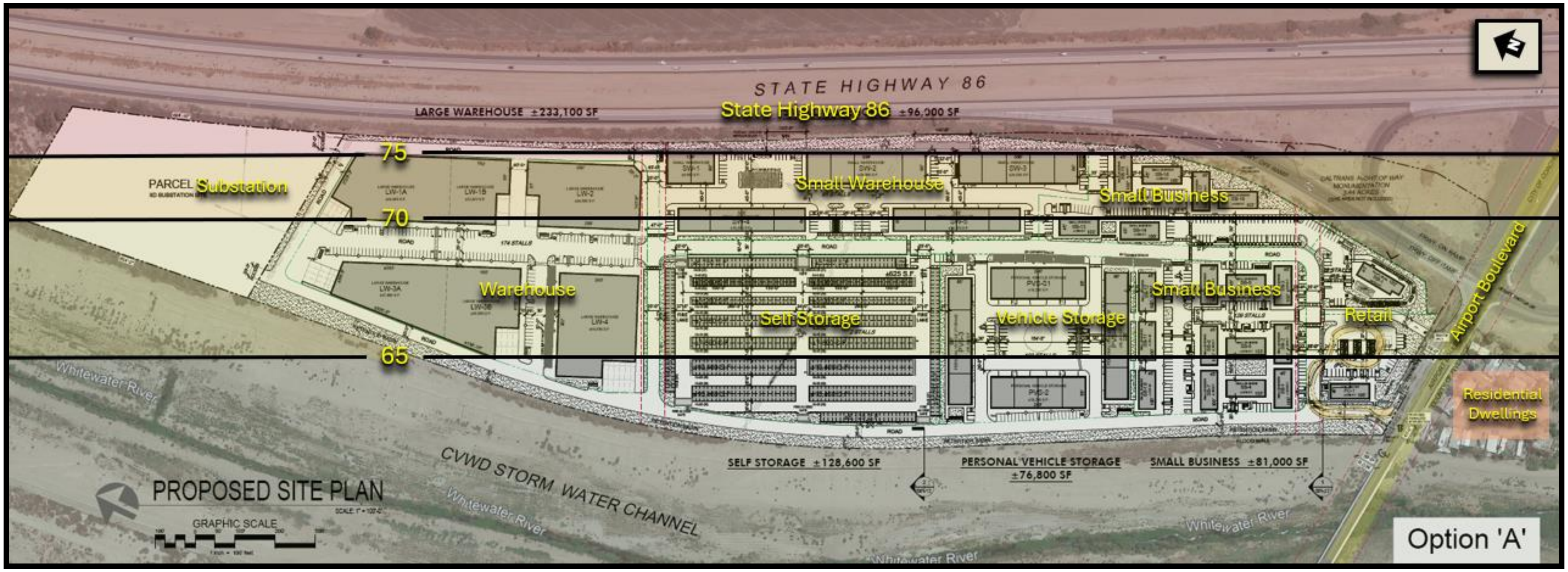
With regard to the proposed onsite commercial and industrial uses, noise-sensitive interior areas would be largely limited to interior offices and meeting rooms. For such areas, an interior noise level of 52 dBA L_{eq} is typically recommended (Caltrans 2022). For newer building construction subject to current building insulation requirements, the average exterior-to-interior noise reductions typically range from approximately 25 to 30 dBA. Proposed onsite land uses would be constructed in compliance with current Green Building Code standards and fresh air supply systems incorporated per current regulatory requirements. Based on the predicted noise levels noted in Table 14 and assuming a minimum exterior-to-interior noise reduction of 25 dBA, predicted interior noise levels of proposed onsite commercial and industrial uses would be approximately 50 dBA L_{eq}, or less. Predicted interior noise levels would not exceed the commonly applied interior noise standard of 52 dBA L_{eq}. As a result, this impact would be considered **less than significant.**

Table 14
Compatibility of Proposed Land Uses with Roadway Traffic Noise

Roadway Segment		Distance to Future Year 2035 Traffic Noise Contours[2]					
		65 dBA CNEL/L_{dn}			70 dBA CNEL/L_{dn}		
SR-86S North of Airport Blvd		631			293		
Land Use	**Distance to Roadway Centerline (ft)[1]**	**Exterior Compatibility Standard**	**Predicted Exterior Noise Level[3]**	**Exceeds?**	**Interior Compatibility Standard**	**Predicted Interior Noise Level[3]**	**Exceeds?**
Retail	400	70	68	**No**	52	**43**	**No**
Small Businesses	154	65	74	**Yes**	52	**49**	**No**
Warehouses/ Utility/ Storage	134	70	75	**Yes**	52	**50**	**No**

1. Represents the distance to the nearest proposed structure of each land use to the roadway centerline of SR-86S. Distances are approximate based on aerial photo interpretation.
2. Distance to traffic noise contours along SR-86S obtained from the City of Coachella General Plan (City of Coachella 2015).
3. Based on predicted noise levels from SR-86S. Roadway Traffic Noise along other area roadways (e.g., Airport Boulevard) would be less. Interior standards based on FHWA noise abate criteria for interior noise-sensitive commercial uses (Caltrans 2020)

Figure 9
Predicted Future Year Roadway Traffic Noise Contours



Locations are approximate. Not to Scale

Impact Noise-2:	Generation of excessive groundborne vibration or groundborne noise levels.

No major stationary sources of groundborne vibration were identified in the project area that would result in the long-term exposure of proposed onsite land uses to unacceptable levels of ground vibration. In addition, the proposed project would not involve the use of any major equipment or processes that would result in potentially significant levels of ground vibration that would exceed these standards at nearby existing land uses. However, construction activities associated with the proposed project would require the use of various tractors, trucks, and jackhammers that could result in intermittent increases in groundborne vibration levels. The use of major groundborne vibration-generating construction equipment/processes (i.e., blasting, pile driving) is not anticipated to be required for the construction of future onsite land uses.

Groundborne vibration levels commonly associated with construction equipment are summarized in Table 15. As depicted in Table 15, groundborne vibration levels generated by construction equipment would be approximately 0.021 in/sec ppv or less at 25 feet (Caltrans 2020). The nearest existing structures are residential dwellings, the nearest of which is located approximately 60 feet south of the proposed project site (Refer to Appendix A). Assuming a maximum equipment vibration level of 0.21 in/sec ppv, or less, at 25 feet at the nearest project site boundary, predicted groundborne vibration levels at this nearest residence would be 0.067 in/sec ppv. Predicted groundborne vibration levels would not exceed the minimum recommended criteria for structural damage or human annoyance (0.5 and 0.2 in/sec ppv, respectively) at nearby land uses (refer to Table 7). As a result, short-term groundborne vibration impacts would be considered **less than significant**.

Table 15
Representative Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 Feet (In/Sec)
Vibratory Roller	0.210
Large Bulldozers	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozers	0.003
Source: FTA 2018, Caltrans 2020	

Impact Noise-3:	*Located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or private-use airport, that exposes people residing or working in the project area to excessive noise levels.*

The nearest airport is the Jacqueline Cochran Regional Airport located approximately 1 mile southwest of the project site. However, as depicted in Appendix A the proposed project site is not located within the projected noise contours of Jacqueline Cochran Regional Airport (Riverside County 2024b). Therefore, Implementation of the proposed project would not result in the exposure of sensitive receptors to excessive aircraft noise levels, nor would the proposed project affect airport operations. This impact is considered **less than significant**.

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APPENDIX A
Noise and Vibration Modeling & Support Documentation

NOISE MEASUREMENT SURVEY FORM

SHEET 1 OF 2

DATE:	1/10/2024
PROJECT:	Coachella Airport Business Park
LOCATION:	Coachella, CA
MONITORING STAFF:	Dylan Mick

LOCATION MAP: *(Include a map of noise measurement locations AND photographs for measurement locations on attached worksheet. Include additional sheets as necessary. Where possible include GPS coordinates.)*

NOISE MEASUREMENT CONDITIONS & EQUIPMENT

MET CONDITIONS & MONITORING EQUIPMENT:	TEMP: 62 F. | HUMIDITY: 30 % | WIND SPEED: 7 MPH | WIND DIR: SE | GROUND: Dry				
	OUD COVER BY CLASS (OC=OVERCAST):	3	(1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT)		
	MET. METER:	Kestrel 5500			
NOISE MONITORING EQUIPMENT:	Piccolo Model	Piccolo-2		S/N:	P0222081908
	MICROPHONE:			S/N:	
	CALIBRATOR:	Reed R8090		S/N:	230829349
NOISE MONITORING SETUP:	WITHIN 10 FT OF REFLECTIVE SURFACE?:	NO	MICROPHONE HEIGHT AGL (FT):		5
	CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS:	yes	METER SETTINGS:	A-WHT	SLOW

NOISE & TRAFFIC MEASUREMENTS

MEASUREMENT		ON		PRIMARY NOISE	MEASURED NOISE LEVELS	
OCATIOI	TIME	(Minutes)	MEASUREMENT LOCATION	SOURCES NOTED	LEQ	Lmax
ST1	2:27:56 AM	10	Southern Project Site Boundary	Traffic, primarily light duty auto with occasional heavy duty auto	67.7	79.4
ST2	2:12:24 PM	10	North of Airport Blvd	Warehouse operational noise and traffic	60	71.4
ST3	2:43:01 PM	10	Desert Catuc Drive and Airport Blvd Intersection	Traffic, primarily light duty auto with occasional heavy duty auto	62.5	77.4
LT1	10/22-10/23	LT	Southern Project Site Boundary, North Side of Airport Blvd, Approx 75 feet from roadway centerline	Refer to Table 3		

NOISE MEASUREMENT SURVEY FORM

	SHEET	**2**	**OF**	**2**

DATE:	1/10/2024
PROJECT:	Coachella Airport Business Park
LOCATION:	Coachella, CA
MONITORING STAFF:	Dylan Mick

SITE PHOTO(S): (Refer to data sheets for noise measurement locations)

MEASUREMENT LOCATION 1

MEASUREMENT LOCATION 2

MEASUREMENT LOCATION 3

MEASUREMENT LOCATION 4

Construction Modeling Assumptions:

- Activities could occur up to the project boundary.
- Distance of 60 feet to nearest receptor.
- Equipment list was based on project specific information.
- Mitigated noise levels include 10 dB reduction from mufflers and engine shrouds.

Site Preperation Equipment List:

- 3 Dozers
- 3 Backhoes
- 1 Tractor

Unmitigated Construction-generated Noise Level at Nearest Reciever (Site Preperation)

Results

Receptor #4: Nearest Sensitive Receptor SitePrep

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	83.4	86.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Dozer	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Dozer	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Dozer	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Backhoe	78.4	74.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Backhoe	78.4	74.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Mitigated Construction-generated Noise Level at Nearest Reciever (Site Preperation)

Results

Receptor #4: Nearest Sensitive Receptor SitePrep

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	73.4	76.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Dozer	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Dozer	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Dozer	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Backhoe	68.4	64.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Backhoe	68.4	64.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Grading Equipment List:

- 1 Grader
- 2 Excavators
- 1 Backhoe
- 1 Tractor
- 4 Scrapers
- 1 Dozer

Unmitigated Construction-generated Noise Level at Nearest Reciever (Grading)

Results

Receptor #1: Nearest Sensitive Receptor Grading

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	83.4	88.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Grader	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Excavator	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Excavator	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Tractor	82.4	78.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Tractor	82.4	78.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Mitigated Construction-generated Noise Level at Nearest Reciever (Grading)

Results

Receptor #1: Nearest Sensitive Receptor Grading

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	73.4	79.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Grader	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Excavator	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Excavator	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Backhoe	68.4	64.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Tractor	72.4	68.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Building Construction Equipment List:

- 3 Gradall
- 1 Generator
- 1 Crane
- 1 Welder
- 1 Backhoe
- 1 Front end loader
- 1 Tractor

Unmitigated Construction-generated Noise Level at Nearest Reciever (Building Construction)

Results

Receptor #2: Nearest Sensitive Receptor BuildingCon

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	83.4	86.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Gradall	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Gradall	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Gradall	83.4	79.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Generator	80.4	77.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Crane	83.4	75.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Mitigated Construction-generated Noise Level at Nearest Reciever (Building Construction)

Results

Receptor #2: Nearest Sensitive Receptor BuildingCon

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	73.4	76.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Gradall	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Gradall	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Gradall	73.4	69.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Generator	70.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Crane	73.4	65.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Paving Equipment List:

- 2 Pavers
- 2 All other equipment
- 2 Rollers
- 1 Air compressor

Unmitigated Construction-generated Noise Level at Nearest Reciever (Paving)

Results

Receptor #3: Nearest Sensitive Receptor Paving

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	83.4	87.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Paver	83.4	80.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Paver	83.4	80.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	All Other Equipment > 5 HP	83.4	80.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	All Other Equipment > 5 HP	83.4	80.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Roller	83.4	76.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

Mitigated Construction-generated Noise Level at Nearest Reciever (Paving)

Results

Receptor #3: Nearest Sensitive Receptor Paving

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	73.4	77.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Paver	73.4	70.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Paver	73.4	70.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	All Other Equipment > 5 HP	73.4	70.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	All Other Equipment > 5 HP	73.4	70.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Roller	73.4	66.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

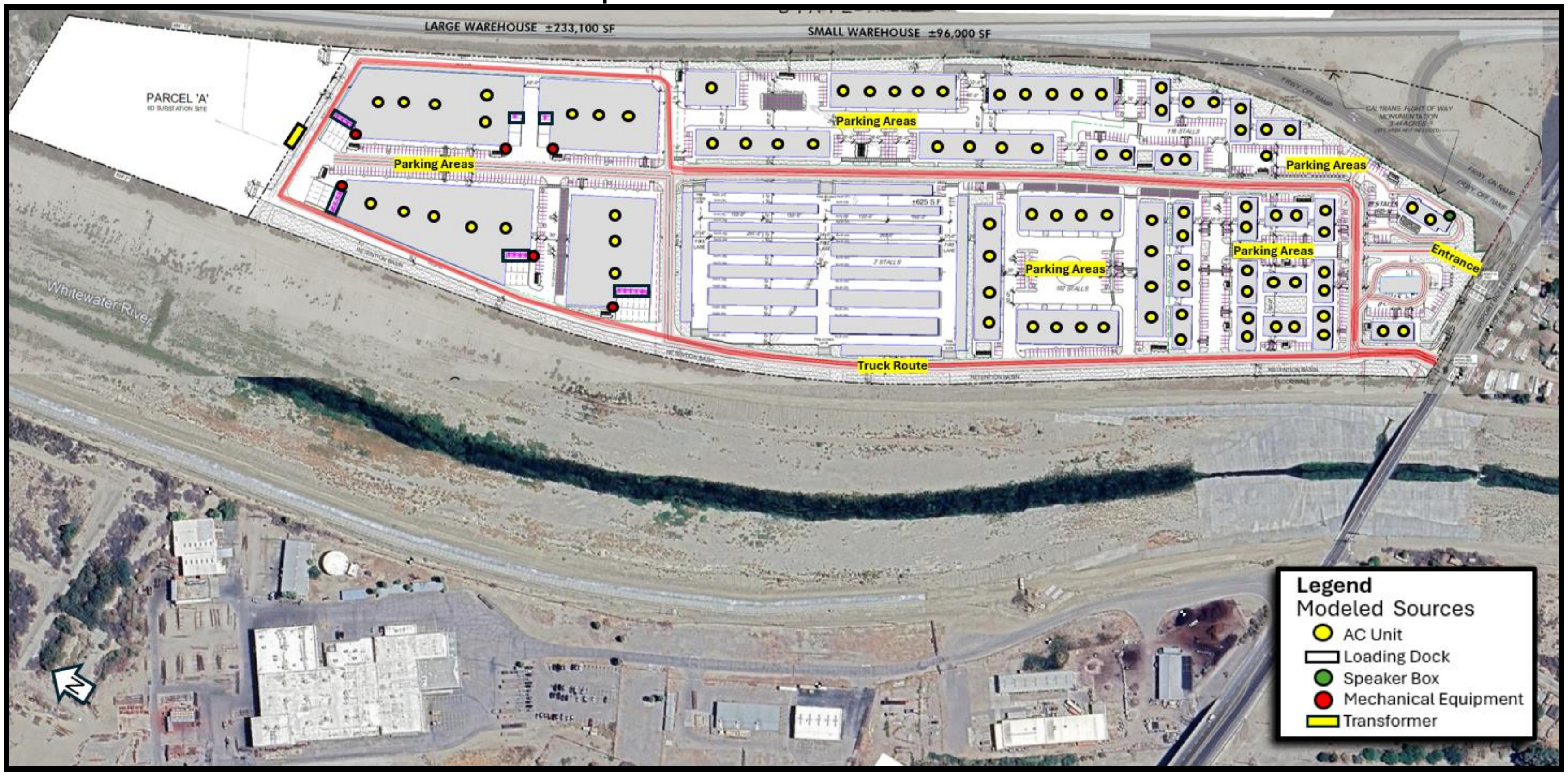
*Total Lmax is the value for the loudest piece of equipment.

Construction-generated Vibration Level at Nearest Reciever

Groundborne Vibration Calculation - Construction

Distance to nearest receptor:	60	feet
Maximum construction vibration level:	0.21	in/sec ppv
Ground attenuation rate:	1.3	
Calculated vibration level at nearest receptor	0.067	in/sec ppv

Proposed Exterior Noise Sources



Sound Plan Daytime Run Info

Coachella Aiport Business Park
Run info
Airport Business Park (Day) 111324

Project info

Project title:	Coachella Aiport Business Park
Project No.:	
Project engineer:	
Customer:	
Description:	

Run description

Calculation type:	Grid Map
Title:	Airport Business Park (Day) 111324
Calculation group	
Run file:	RunFile.runx
Result number:	19
Local calculation (ThreadCount=16)	
Calculation start:	11/13/2024 9:49:23 AM
Calculation end:	11/13/2024 9:51:03 AM
Calculation time:	01:34:195 [m:s:ms]
No. of points:	6867
No. of calculated points:	6867
Kernel version:	SoundPLANnoise 9.0 (4/18/2024) - 64 bit

Run parameters

Reflection order: 3
Maximum reflection distance to receiver 200 m
Maximum reflection distance to source 50 m
Search radius 5000 m
Weighting: dB(A)
Allowed tolerance: 0.100 dB
Create ground effect areas from road surfaces: Yes
Treat roads as terrain following: No

Standards:
Road: FHWA: 1978
Emission according to: FHWA
Limitation of screening loss:
single/multiple 20.0 dB /23.0 dB
Side diffraction: disabled
No fleet corrections
Attenuation
Foliage: User defined
Built-up area: User defined
Industrial site: User defined

Industry: ISO 9613-2: 1996
Air absorption: ISO 9613-1
regular ground effect (chapter 7.3.1), for sources without a spectrum automatically alternative ground effect
Limitation of screening loss:

Coachella Aiport Business Park
Run info
Airport Business Park (Day) 111324

single/multiple 20.0 dB /25.0 dB
Side diffraction: ISO/TR 17534-3:2015 compliant: no side diffraction if terrain blocks line of sight
Use Eqn (Abar=Dz-Max(Agr,0)) instead of Eqn (12) (Abar=Dz-Agr) for insertion loss
Environment:
Air pressure 1013.3 mbar
rel. humidity 70.0 %
Temperature 10.0 °C
Meteo. corr. C0(7-19h)[dB]=0.0; C0(19-22h)[dB]=0.0; C0(22-7h)[dB]=0.0;
Ignore Cmet for Lmax industry calculation: No
Parameter for screening: C2=20.0
Dissection parameters:
Distance to diameter factor 8
Minimal distance 1 m
Max. difference ground effect + diffraction 1.0 dB
Max. number of iterations 4
Attenuation
Foliage: ISO 9613-2
Built-up area: ISO 9613-2
Industrial site: ISO 9613-2

Assessment: CNEL (CA)
Grid Noise Map:
Grid space: 10.00 m
Height above ground: 1.500 m
Grid interpolation:
Field size = 9x9
Min/Max = 10.0 dB
Difference = 0.2 dB
Limit level= 40.0 dB

Geometry data

Airport Business Park with Terrain (Day).sit 11/13/2024 9:47:58 AM
- contains:

AC Units.geo	11/6/2024 11:17:22 AM
Building Mechanical.geo	11/6/2024 10:53:38 AM
Drive Thru Loop.geo	11/7/2024 10:04:14 AM
Drive Thru Speaker.geo	11/6/2024 10:53:40 AM
Gas Station Loop.geo	11/7/2024 10:04:14 AM
HD Truck Loop.geo	11/6/2024 10:53:40 AM
Imported elevation points2.geo	11/6/2024 10:03:52 AM
Large Warehouse Traffic.geo	11/7/2024 10:04:14 AM
Loading Docks.geo	11/6/2024 10:53:40 AM
Parking Lots.geo	11/6/2024 10:53:40 AM
Project Buildings.geo	11/6/2024 10:53:40 AM
Receiver.geo	11/13/2024 9:47:40 AM
Residential Mini Wall.geo	11/7/2024 10:26:02 AM
Terrain.geo	11/6/2024 10:53:40 AM
Transformers.geo	11/12/2024 2:24:04 PM
RDGM0008.dgm	11/6/2024 10:04:30 AM

Sound Plan Nighttime Run Info

Coachella Aiport Business Park
Run info
Airport Business Park (Night) 111324

Project info

Project title: Coachella Aiport Business Park
Project No.:
Project engineer:
Customer:

Description:

Run description

Calculation type: Grid Map
Title: Airport Business Park (Night) 111324
Calculation group
Run file: RunFile.runx
Result number: 20
Local calculation (ThreadCount=16)
Calculation start: 11/13/2024 9:51:06 AM
Calculation end: 11/13/2024 9:51:14 AM
Calculation time: 00:03:521 [m:s:ms]
No. of points: 6867
No. of calculated points: 6867
Kernel version: SoundPLANnoise 9.0 (4/18/2024) - 64 bit

Run parameters

Reflection order: 3
Maximum reflection distance to receiver 200 m
Maximum reflection distance to source 50 m
Search radius 5000 m
Weighting: dB(A)
Allowed tolerance: 0.100 dB
Create ground effect areas from road surfaces: Yes
Treat roads as terrain following: No

Standards:
Road: FHWA: 1978
Emission according to: FHWA
Limitation of screening loss:
single/multiple 20.0 dB /23.0 dB
Side diffraction: disabled
No fleet corrections
Attenuation
Foliage: User defined
Built-up area: User defined
Industrial site: User defined

Industry: ISO 9613-2: 1996
Air absorption: ISO 9613-1
regular ground effect (chapter 7.3.1), for sources without a spectrum automatically alternative ground effect
Limitation of screening loss:

Coachella Aiport Business Park
Run info
Airport Business Park (Night) 111324

single/multiple 20.0 dB /25.0 dB
Side diffraction: ISO/TR 17534-3:2015 compliant: no side diffraction if terrain blocks line of sight
Use Eqn (Abar=Dz-Max(Agr,0)) instead of Eqn (12) (Abar=Dz-Agr) for insertion loss
Environment:
Air pressure 1013.3 mbar
rel. humidity 70.0 %
Temperature 10.0 °C
Meteo. corr. C0(7-19h)[dB]=0.0; C0(19-22h)[dB]=0.0; C0(22-7h)[dB]=0.0;
Ignore Cmet for Lmax industry calculation: No
Parameter for screening: C2=20.0
Dissection parameters:
Distance to diameter factor 8
Minimal distance 1 m
Max. difference ground effect + diffraction 1.0 dB
Max. number of iterations 4
Attenuation
Foliage: ISO 9613-2
Built-up area: ISO 9613-2
Industrial site: ISO 9613-2

Assessment: CNEL (CA)
Grid Noise Map:
Grid space: 10.00 m
Height above ground: 1.500 m
Grid interpolation:
Field size = 9x9
Min/Max = 10.0 dB
Difference = 0.2 dB
Limit level= 40.0 dB

Geometry data

Airport Business Park with Terrain (Night).sit 11/12/2024 2:42:24 PM
- contains:
AC Units (Night).geo 11/7/2024 9:40:32 AM
Gas Station Loop (Night).geo 11/7/2024 10:05:12 AM
Imported elevation points2.geo 11/6/2024 10:03:52 AM
Parking Lots (Night).geo 11/7/2024 9:40:32 AM
Project Buildings.geo 11/6/2024 10:53:40 AM
Receiver.geo 11/13/2024 9:47:40 AM
Terrain.geo 11/6/2024 10:53:40 AM
Transformers (Night).geo 11/7/2024 9:38:00 AM
RDGM0008.dgm 11/6/2024 10:04:30 AM

Traffic Noise Modeling (No Build Scenarios)

Predicted Traffic Noise Levels - 2027 No build								
	Existing Noise Level - dBA CNEL/Ldn							
	Avg	Avg		at 50ft	Distance to Contours			
Air Port Blvd	Lanes	Speeds	ADT	NTLCL	55 CNEL	60 CNEL	65 CNEL	70 CNEL
SR-86 SB Ramps to SR-86 NB Ramps	2	30	7,376	61.14	250.4	80	0	0
SR-86 SB Ramps to Project Driveway	2	30	9,145	62.08	310.3	98.8	0	0
Project Driveway to Palm Street	2	30	9,227	61.37	313.3	102.3	0	0
Palm Street to Polk Street	4	30	8,362	60.92	284.2	93.6	0	0

Predicted Traffic Noise Levels - 2030 No build								
	Existing Noise Level - dBA CNEL/Ldn							
	Avg	Avg		at 50ft	Distance to Contours			
Airport Blvd Segments	Lanes	Speeds	ADT	NTLCL	55 CNEL	60 CNEL	65 CNEL	70 CNEL
SR-86 SB Ramps to SR-86 NB Ramps	2	30	10,402	62.63	352.9	112.2	0	0
SR-86 SB Ramps to Project Driveway	2	30	12,525	63.44	424.8	134.8	0	0
Project Driveway to Palm Street	2	30	11,586	62.35	392.9	126.9	0	0
Palm Street to Polk Street	4	30	10,142	61.75	344.2	111.9	0	0

Predicted Traffic Noise Levels - 2045 No build								
	Existing Noise Level - dBA CNEL/Ldn							
	Avg	Avg		at 50ft	Distance to Contours			
Airport Blvd Segments	Lanes	Speeds	ADT	NTLCL	55 CNEL	60 CNEL	65 CNEL	70 CNEL
SR-86 SB Ramps to SR-86 NB Ramps	2	30	12,438	63.4	421.9	133.9	0	0
SR-86 SB Ramps to Project Driveway	2	30	14,604	64.1	495.3	157.1	0	0
Project Driveway to Palm Street	2	30	13,305	63.0	450.9	144.9	0	0
Palm Street to Polk Street	4	30	11,691	62.4	396.4	128	0	0

Traffic Noise Modeling (Build Scenarios)

Predicted Traffic Noise Levels - 2027 Build

Roadways	Existing Plus Project - dBA CNEL/Ldn								Change at 50ft NTLCL
	Avg Lanes	Avg Speeds	ADT	at 50ft NTLCL	Distance to Contours				
					55	60	65	70	
SR-86 SB Ramps to SR-86 NB Ramps	2	30	8,786	61.9	298.1	95	0	0	-0.76
SR-86 SB Ramps to Project Driveway	2	30	10,995	62.88	373	118.5	0	0	-0.8
Project Driveway to Palm Street	2	30	10,137	61.77	344	111.8	0	0	-0.4
Palm Street to Polk Street	4	30	8,692	61.08	295.3	97	0	0	-0.16

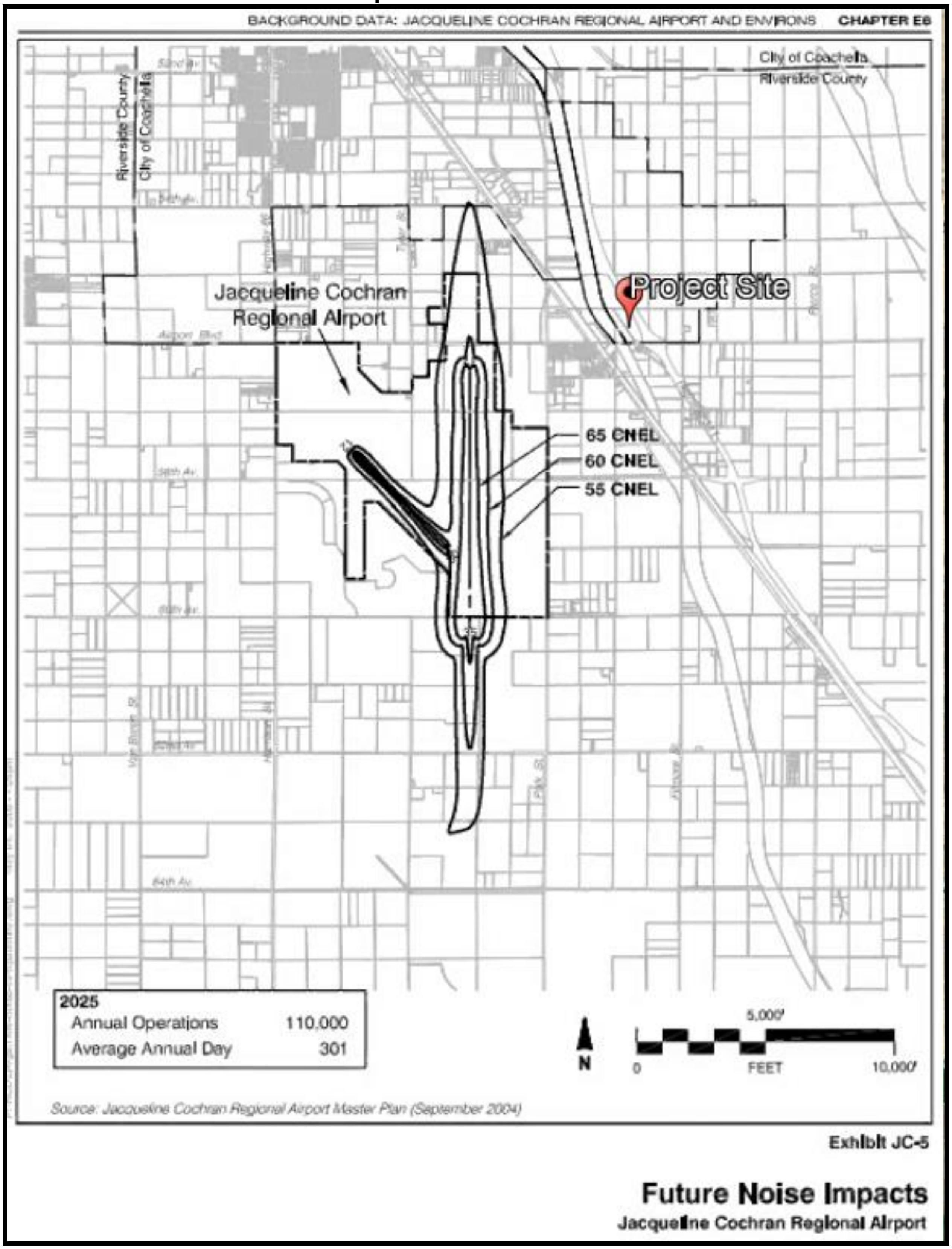
Predicted Traffic Noise Levels - 2030 Build

Airport Blvd Segments	Existing Plus Project - dBA CNEL/Ldn								Change at 50ft NTLCL
	Avg Lanes	Avg Speeds	ADT	at 50ft NTLCL	Distance to Contours				
					55	60	65	70	
SR-86 SB Ramps to SR-86 NB Ramps	2	30	10,822	62.81	367.1	116.7	0	0	-0.18
SR-86 SB Ramps to Project Driveway	2	30	13,075	63.63	443.5	140.7	0	0	-0.19
Project Driveway to Palm Street	2	30	11,856	62.45	402	129.7	0	0	-0.1
Palm Street to Polk Street	4	30	10,242	61.8	347.6	113	0	0	-0.05

Predicted Traffic Noise Levels - 2045 Build

Airport Blvd Segments	Existing Plus Project - dBA CNEL/Ldn								Change at 50ft NTLCL
	Avg Lanes	Avg Speeds	ADT	at 50ft NTLCL	Distance to Contours				
					55	60	65	70	
SR-86 SB Ramps to SR-86 NB Ramps	2	30	12,788	63.53	433.7	137.6	0	0	-0.12
SR-86 SB Ramps to Project Driveway	2	30	15,074	64.25	511.2	162.1	52.5	0	-0.14
Project Driveway to Palm Street	2	30	13,535	63.03	458.7	147.3	0	0	-0.08
Palm Street to Polk Street	4	30	11,771	62.42	399.1	128.8	0	0	-0.03

Airport Noise Contours



Source: Riverside County 2024

Nearest Noise Sensitive Receptor