

Acoustical Assessment
14005 Live Oak Avenue Project
City of Irwindale, California

Prepared by:

Kimley»»Horn

Expect More. Experience Better.

Kimley-Horn and Associates, Inc.
660 South Figueroa Street, Suite 2050
Los Angeles, California 90017
Contact: Noemi Wyss

September 2024

TABLE OF CONTENTS

1 INTRODUCTION..... 1

1.1 Project Location and Setting1

1.2 Project Description.....1

2 ACOUSTIC FUNDAMENTALS 6

2.1 Sound and Environmental Noise.....6

2.2 Ground-Borne Vibration.....10

3 REGULATORY SETTING12

3.1 Federal12

3.2 State of California.....12

3.3 Local12

4 EXISTING CONDITIONS16

4.1 Existing Noise Sources.....16

4.2 Noise Measurements16

4.3 Sensitive Receptors18

5 SIGNIFICANCE CRITERIA AND METHODOLOGY21

5.1 CEQA Thresholds21

5.2 Methodology.....21

6 POTENTIAL IMPACTS AND MITIGATION.....23

6.1 Acoustical Impacts23

6.2 Cumulative Noise Impacts.....30

7 REFERENCES 32

TABLES

Table 1: Typical Noise Levels6

Table 2: Definitions of Acoustical Terms7

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations11

Table 4: Ambient Base Noise Levels13

Table 5: Baldwin Park Interior and Exterior Noise Standards.....14

Table 6: Baldwin Park Municipal Code Noise Standards15

Table 7: Existing Noise Measurements.....16

Table 8: Sensitive Receptors.....18

Table 9: Typical Construction Noise Levels.....23

Table 10: Project Construction Noise Levels25

Table 11: Typical Construction Equipment Vibration Levels29

EXHIBITS

Exhibit 1: Regional Vicinity Map3

Exhibit 2: Local Vicinity Map.....4

Exhibit 3: Site Plan5

Exhibit 4: Noise Measurement Locations17

Exhibit 5: Sensitive Receptors.....19

APPENDIX

Appendix A: Noise Data

LIST OF ABBREVIATED TERMS

APN	Assessor's Parcel Number
ADT	Average daily traffic
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
CNEL	Community equivalent noise level
EV	Electric Vehicle
L_{dn}	Day-night noise level
dB	Decibel
L_{eq}	Equivalent noise level
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	Heating ventilation and air conditioning
Hz	Hertz
in/sec	Inches per second
L_{max}	Maximum noise level
μPa	Micropascals
L_{min}	Minimum noise level
PPV	Peak particle velocity
RMS	Root mean square
VdB	Vibration velocity level

1 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the 14005 Project (“Project” or “proposed Project”). The purpose of this Acoustical Assessment is to evaluate the potential construction and operational noise and vibration levels associated with the Project and determine the level of impact the Project would have on the environment.

1.1 Project Location

The Project site is located in the eastern portion of the City of Irwindale (City of Irwindale) in the County of Los Angeles (County). The City is approximately 20 miles east of downtown Los Angeles and is neighbored by the cities of West Covina, Baldwin Park, Azusa, Duarte, El Monte, Monrovia, and the unincorporated areas of Los Angeles County; see **Exhibit 1: Regional Vicinity Map**. The Project site is located at 14005 Live Oak Avenue at the northeastern corner of the Live Oak Avenue/Stewart Avenue intersection and is bound by vacant land currently undergoing grading to the east, Live Oak Avenue and the City of Baldwin Park to the south, Stewart Avenue to the west, and Rivergrade Road to the north (see **Exhibit 2: Local Vicinity Map**). The Project site is comprised of 5.13 gross acres (4.86 net acres, Assessor’s Parcel Number 8535-001-033), with 0.27 acres designated as street dedication.

Regional access to the Project site is provided via the Interstate 605 freeway (I-605) located approximately 0.6-mile to the west. The Interstate 210 (I-210), Interstate 10 (I-10), and State Route 39 (SR-39) freeways also provide regional access to the Project site and are approximately 1.8 miles north, 2.5 miles south, and 3.4 miles east of the Project site, respectively. Local access to the Project site is provided via Live Oak Avenue to the east and Rivergrade Road to the north.

1.2 Project Description

The Project proposes to demolish the existing 56,000-square foot industrial office building and construct a one-story concrete tilt-up warehouse building with a mezzanine totaling 102,424 square feet with associated employee parking, truck docks, and landscaping. The proposed building would include 6,000 square feet of office space in the southeastern portion of the building (3,000 square feet each on the ground floor and mezzanine), and 96,400 square feet of warehouse space on the ground floor; refer to **Exhibit 3: Site Plan**. The Project would have a floor area ratio (FAR) of 0.48. An outdoor employee break area would be located immediately south of the proposed building adjacent to the office space. The Project would be designed to comply with Leadership in Energy and Environmental Design (LEED) Gold standards. The Project would also include security measures such as security lighting, a surveillance camera system, and 24/7 security personnel. As the proposed building is a speculative warehouse with no known tenant, this analysis assumes that the new building would be 100 percent warehousing and would not include any manufacturing, cold storage, or refrigerated space. The Project proposes one electric pump for fire protection services and one emergency diesel generator was modeled for the site.¹

¹ The emergency generator fuel type is diesel (175-300 HP), assumed for a maximum maintenance and testing of one hour a day or 50 hours per year. The proposed generator has 238 horsepower with a load factor of 0.73.

Access and Parking

The proposed building would have a main entrance/storefront on the southeastern side of the building that would lead into the office space. Eight (8) smaller entrances with stairs and handrails would be on the northern, western, and southern sides of the building, and five (5) would be on the eastern side to provide access to the truck yard and parking lots.

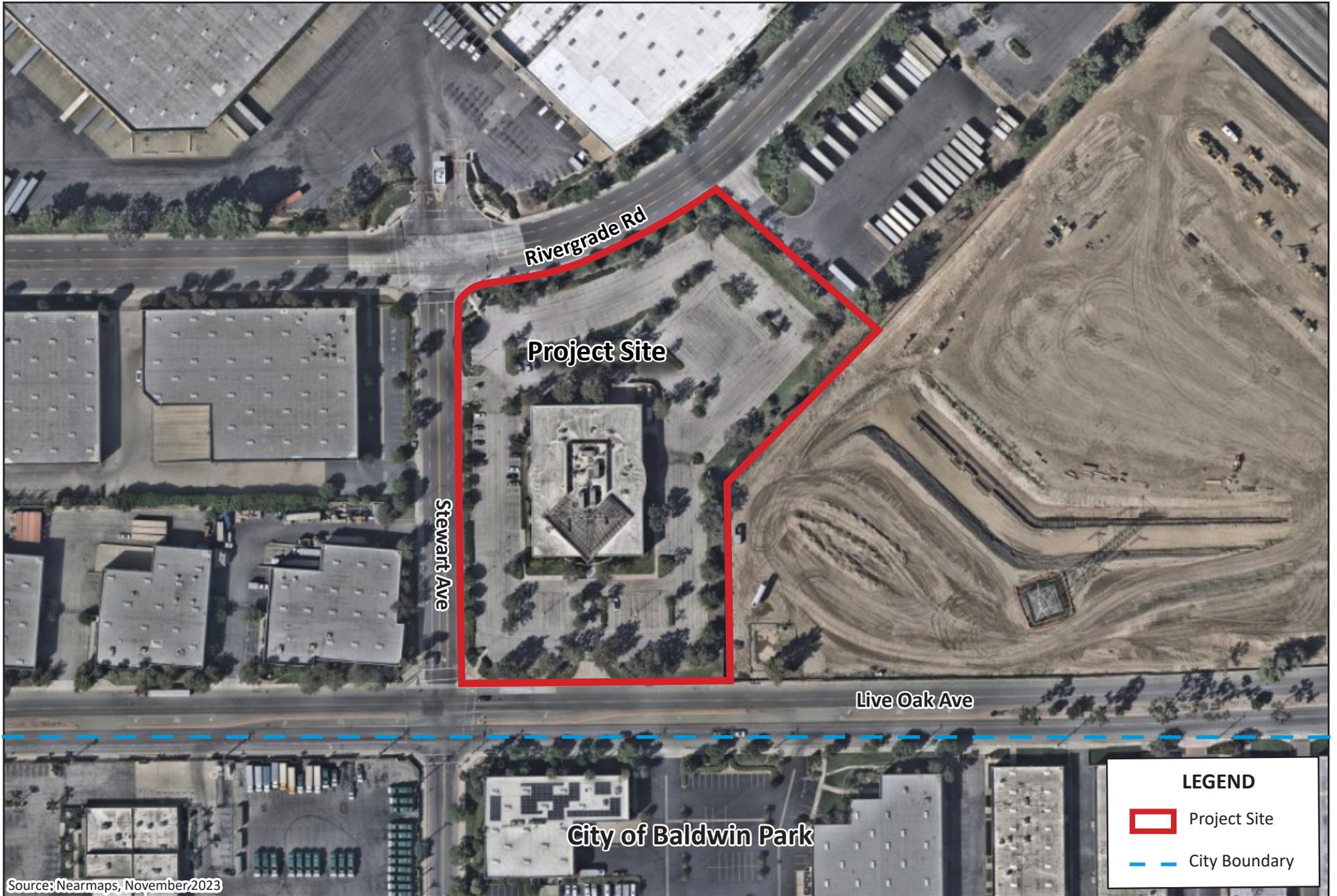
Vehicular access to the Project site would be provided via two (2) new 40-foot driveways: one (1) each off Rivergrade Road and Live Oak Avenue. The northern driveway off Rivergrade Road would provide full ingress and egress for trucking and automobiles for employees only. The southern driveway off Live Oak Avenue would provide ingress and egress only for employee/visitor vehicles and would allow right-in/right-out access only. Both driveways would connect to an internal drive aisle, which is divided by a manual tube steel swing gate on the central eastern portion of the Project site. The gate would restrict access into the truck yard and parking areas on the northeastern portion of the Project site to employees only. The internal drive aisle would also operate as a fire access lane and provide an unobstructed width of 28 feet. The Project would remove and reconstruct the existing Project site driveways in accordance with applicable engineering standards of the City of Irwindale Public Works Department.

The Project proposes to provide sixty-five (65) parking spaces throughout the parking lots, which would include fifteen (15) compact spaces on the northeastern portion of the Project site; and four (4) handicapped accessible spaces, twelve (12) electric vehicle (EV) spaces, and seven (7) EV charging station stalls on the central and southeastern portions. The Project would also provide twelve (12) dock positions and thirteen (13) trailer stalls along the northeastern Project site boundary and across from the proposed truck yard. Additionally, the Project would provide four (4) long-term and four (4) short-term bicycle spaces adjacent to the central and southeastern parking lots. The dock doors would be used for truck loading and unloading in the truck yard adjacent to the northeastern portion of the proposed building.

Pedestrian access would be provided via a new meandering concrete sidewalk along the street frontages on Rivergrade Road, Stewart Avenue, and Live Oak Avenue. The existing public sidewalk abutting the Project site would be demolished and replaced with a new sidewalk including curbs, gutters, and landscaping improvements as needed to facilitate Project site access along the Project's frontage, consistent with the City's standards. The Project would also include a 10-foot street easement dedication (totaling 0.27 acres) along Rivergrade Road, Stewart Avenue, and Live Oak Avenue. Additionally, internal walkways leading to the various entrances of the proposed building would be provided onsite and would connect to the new public sidewalk.

Construction Activities

Construction is anticipated to occur over a duration of approximately 13 months, commencing as early as September 2025. There would be approximately 12,345 tons of demolition and no anticipated import or export of soil.



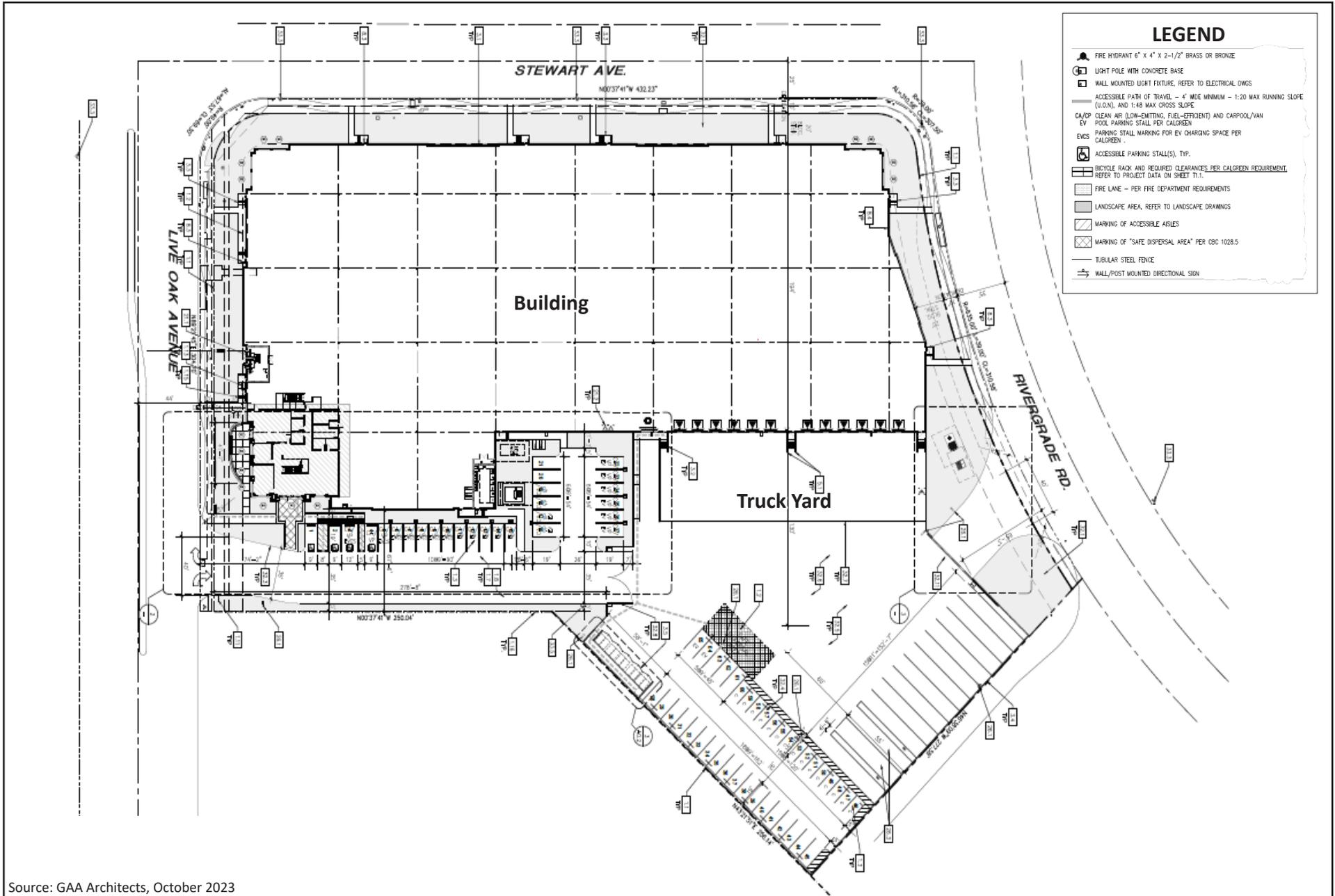
Source: Nearmaps, November 2023

Exhibit 2: LOCAL VICINITY MAP

14005 Live Oak Avenue Project



Kimley»Horn



Source: GAA Architects, October 2023

Exhibit 3: SITE PLAN
14005 Live Oak Avenue Project



Kimley»Horn

2 ACOUSTIC FUNDAMENTALS

2.1 Sound and Environmental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g., air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. The fundamental model consists of a noise source, a receptor, and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this ambient noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micro-pascals (μPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. **Table 1: Typical Noise Levels** provides typical noise levels.

Table 1: Typical Noise Levels		
Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	- 110 -	Rock Band
Jet fly-over at 1,000 feet		
	- 100 -	
Gas lawnmower at 3 feet		
	- 90 -	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	- 80 -	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	- 70 -	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	- 60 -	
		Large business office
Quiet urban daytime	- 50 -	Dishwasher in next room
Quiet urban nighttime	- 40 -	Theater, large conference room (background)
Quiet suburban nighttime		
	- 30 -	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	- 20 -	
		Broadcast/recording studio
	- 10 -	
Lowest threshold of human hearing	- 0 -	Lowest threshold of human hearing

Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

Noise Descriptors

The dB 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. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) represents the equivalent continuous sound pressure level over the measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of sound energy during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in **Table 2: Definitions of Acoustical Terms**.

Table 2: Definitions of Acoustical Terms	
Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in μPa (or 20 microneutons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g. 20 μPa). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Maximum Noise Level (L_{max}) Minimum Noise Level (L_{min})	The maximum and minimum dBA during the measurement period.
Exceeded Noise Levels (L_{01} , L_{10} , L_{50} , L_{90})	The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day-Night Noise Level (L_{dn})	A 24-hour average L_{eq} with a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn} .
Community Noise Equivalent Level (CNEL)	A 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

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

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound.² When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.³ Under the dB scale, three sources of equal loudness together would produce an increase of approximately 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics.⁴ No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA.⁵ The way older homes in California were constructed generally

² FHWA, *Noise Fundamentals*, 2017. Available at: https://www.fhwa.dot.gov/Environment/noise/regulations_and_guidance/polguide/polguide02.cfm

³ Ibid.

⁴ California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, Page 2-29, September 2013.

⁵ James P. Cowan, *Handbook of Environmental Acoustics*, 1994.

provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

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.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA.⁶ Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted⁷:

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA 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 People

Hearing Loss. While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes

⁶ Compiled from James P. Cowan, *Handbook of Environmental Acoustics*, 1994 and Cyril M. Harris, *Handbook of Noise Control*, 1979.

⁷ Compiled from California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, and FHWA, *Noise Fundamentals*, 2017.

for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance⁸.

2.2 Ground-Borne Vibration

Sources of ground-borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions or heavy equipment use during construction). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is vibration decibels (VdB) (the vibration velocity level in decibel scale). Other methods are the peak particle velocity (PPV) and the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in **Table 3** should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for ground-borne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

⁸ Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations			
Maximum PPV (in/sec)	Vibration Annoyance Potential Criteria	Vibration Damage Potential Threshold Criteria	FTA Vibration Damage Criteria
0.008	--	Extremely fragile historic buildings, ruins, ancient monuments	--
0.01	Barely Perceptible	--	--
0.04	Distinctly Perceptible	--	--
0.1	Strongly Perceptible	Fragile buildings	--
0.12	--	--	Buildings extremely susceptible to vibration damage
0.2	--	--	Non-engineered timber and masonry buildings
0.25	--	Historic and some old buildings	--
0.3	--	Older residential structures	Engineered concrete and masonry (no plaster)
0.4	Severe	--	--
0.5	--	New residential structures, Modern industrial/commercial buildings	Reinforced-concrete, steel or timber (no plaster)
PPV = peak particle velocity; in/sec = inches per second; FTA = Federal Transit Administration			
Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual, 2020 and Federal Transit administration, Transit Noise and Vibration Assessment Manual, 2018.			

3 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging as well as intrusive noise levels, the Federal government, the State of California, various county governments, and most municipalities in the State have established standards and ordinances to control noise.

3.1 Federal

Federal Transit Administration Noise and Vibration Guidance

The Federal Transit Administration (FTA) has published the Transit Noise and Vibration Impact Assessment Manual (FTA Transit Noise and Vibration Manual) to provide guidance on procedures for assessing impacts at different stages of transit project development. The report covers both construction and operational noise impacts and describes a range of measures for controlling excessive noise and vibration. In general, the primary concern regarding vibration relates to potential damage from construction. The guidance document establishes criteria for evaluating the potential for damage for various structural categories from vibration.

3.2 State of California

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of “normally acceptable”, “conditionally acceptable”, “normally unacceptable”, and “clearly unacceptable” noise levels for various land use types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

Title 24 – Building Code

The State’s noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.3 Local

City of Irwindale General Plan

The Irwindale General Plan identifies policies in the Safety Element Policy. The Safety Element policies seek to reduce community noise exposure to excessive noise levels through the establishment of noise level standards for a variety of land uses.

The City's General Plan acknowledges the State Office of Noise Control *Guidelines for the Preparation and Content of Noise Elements of General Plans*, which is a guide for compatibility of noise-sensitive land uses in areas subject to noise levels of 55 to 80 dB CNEL or L_{dn} . Residential uses are normally unacceptable in areas exceeding 70 dB CNEL; and conditionally acceptable between 55-70 dB CNEL for low-density single-family dwelling units, duplexes, and mobile homes, and between 60-70 dB CNEL for multiple-family units. Schools, libraries, hospitals, and nursing homes are treated as noise-sensitive land uses, requiring acoustical studies within areas exceeding 60 dB CNEL. Commercial/professional office buildings and industrial land uses are normally unacceptable in areas exceeding 75 dB CNEL, and are conditionally acceptable within 67 to 78 dB CNEL (for commercial and professional offices only). The City's General Plan does not specifically acknowledge the State's noise guidelines for playgrounds and neighborhood parks. These land uses are normally unacceptable in areas exceeding 70 dBA CNEL, and are unacceptable in areas exceeding 75 dBA CNEL.

Public Safety Element

- Policy 4:** The City of Irwindale will strive to reduce the community's exposure to noise from on-going manufacturing activities.
- Policy 5:** The City of Irwindale will work towards reducing noise exposure in the City by considering noise and land use compatibility in land use planning.
- Policy 6:** The City of Irwindale will continue to investigate strategies that will be effective in reducing the community's exposure to harmful noise levels.

City of Irwindale Municipal Code

Irwindale Municipal Code (IMC) Chapter 9.28 Noise Regulation Section 9.28.030 regulates noise levels. **Table 4: Ambient Base Noise Levels** displays ambient noise levels for residential, commercial, and industrial zones. The section also states any noise at a level which exceeds the ambient base level as set forth in **Table 4** below, whichever is greater, by more than 10 dB measured at any boundary line of the property from which the noise emanates shall constitute sufficient proof of a violation.

Zone	7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
Residential	50 dBA	45 dBA
Commercial	55 dBA	50 dBA
Industrial	70 dBA	60 dBA

Source: Irwindale Municipal Code, Chapter 9.28.030

IMC Section 9.28.040, Noise Level violation designated. IMC Section 9.28.040 declares the following relevant act to be unlawful:

- It is unlawful for any person to willfully make or continue, or cause to be made or continued any noise at a level which exceeds by more than five dB the ambient or the ambient base level as set forth in Section 9.28.030, whichever is greater, when measured at any boundary line of the property from which the noise emanates.

IMC Section 9.28.110, Construction of building and projects – Time specified. IMC Section 9.28.110 declares the following times of construction and act to be unlawful:

- It is unlawful for any person within a residential zone, or within a radius of five hundred feet therefrom, to operate equipment or perform any outside construction or repair work on buildings, structures, or projects or to operate any pile driver, steam shovel, pneumatic hammer, derrick, steam, or electric hoist to other construction type device on a development requiring a city permit, in such a manner that noise is produced which would constitute a violation of Section 9.28.040, unless beforehand authorization therefore has been duly obtained from the building inspector. Such activity is unlawful without a permit during all hours on Sunday. No permit shall be required to perform emergency work as defined in subsection E of 9.28.020.
- Construction authorized by subsection A of this section shall be limited to 7:00 a.m. to 7:00 p.m.

City of Baldwin Park General Plan

As discussed in *Section 4.3* below, the proposed Project is located approximately 445 feet northwest of residences within the City of Baldwin Park. As such, the pertinent noise standards and regulations for the City of Baldwin Park are provided below and discussed further *Section 6* below. The Noise Element of the Baldwin Park 2020 General Plan contains land use compatibility guidelines which are summarized in **Table 5: Baldwin Park Interior and Exterior Noise Standards**.

Land Use	Interior ¹	Exterior ²
Residential – Single family, multifamily, duplex, mobile home	45 dBA CNEL	65 dBA CNEL
Residential – Transient lodging, hotels, motels, nursing homes, hospitals	45 dBA CNEL	65 dBA CNEL
Private Offices, churches, libraries, board rooms, conference rooms, theaters, auditoriums, concert halls, meeting halls, etc.	45 dBA L _{eq} (12 hours)	-
Schools	45 dBA L _{eq} (12 hours)	67 dBA L _{eq}
General office, reception, clerical, etc.	50 dBA L _{eq} (12 hours)	-
Bank, lobby, retail store, restaurant, typing pool, etc.	55 dBA L _{eq} (12 hours)	-
Manufacturing, kitchen, warehousing, etc.	65 dBA L _{eq} (12 hours)	-
Parks, playgrounds	-	65 dBA CNEL
Golf Courses, outdoor spectator sports, amusement parks	-	70 dBA CNEL

1. Indoor standard with windows closed. Indoor environment excludes bathrooms, toilets, closets, and corridors.
 2. Outdoor environment limited to rear yard of single-family homes, multifamily patios and balconies and common recreation areas. Outdoor environment limited to playground areas, picnic areas, and other areas of frequent human use.
 Source: City of Baldwin Park, *Baldwin Park 2020 General Plan Noise Element*, 2002.

City of Baldwin Park Municipal Code

The City of Baldwin Park Municipal Code (BPMC) Section 130.34 limits the exterior noise standards for specific land uses as shown in **Table 6: Baldwin Park Municipal Code Noise Standards**. The BPMC Section 130.34 also limits the interior noise levels at any dwelling unit to 45 dBA at any time. Section 130.37 of the BPMC restricts construction from occurring within 500 feet of a residential zone between the hours of 7:00 p.m. and 7:00 a.m. in such a way the causing discomfort or annoyance unless a permit has been obtained from the Department of Public Works.

Zone	7 a.m. to 10 p.m.	10 p.m. to 7 a.m.
Single-Family Residential (R-1)	55 dBA	45 dBA
Garden Multi-family Residential (RG) and High Density Multi-family Residential (R-3)	60 dBA	55 dBA
Commercial	65 dBA	60 dBA
Industrial	70 dBA	70 dBA

Source: Baldwin Park Municipal Code, Chapter 130.34

4 EXISTING CONDITIONS

4.1 Existing Noise Sources

The City is impacted by various noise sources. Mobile sources of noise, especially cars, trucks, and trains are the most common and significant sources of noise. Other noise sources are the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the City that generate stationary-source noise.

Mobile Sources

The predominant mobile noise source near the Project site is the traffic noise along Live Oak Avenue, which is located directly south of the site, Stewart Avenue, which is located to the west, and Rivergrade road, which is located north of the site. Interstate-605 (I-605) is located approximately 0.6-mile to the west of the Project site and is also a contributor to mobile traffic noise in the vicinity of the site.

Stationary Sources

The primary sources of stationary noise in the vicinity of the Project site are those associated with the operations of adjacent commercial and industrial uses surrounding the site. The noise associated with these sources may represent a single-event noise occurrence or short-term noise. Other noises include those typical of urban areas, including mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment), dogs barking, idling vehicles, and employee/patron talking.

4.2 Noise Measurements

To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements on December 14, 2023; see **Appendix A: Noise Data**. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site. The 15-minute measurements were taken between 8:22 a.m. and 9:40 a.m. near potential and existing sensitive receptors (see **Exhibit 4: Noise Measurement Locations**) surrounding the site. Short-term L_{eq} measurements are considered representative of the noise levels throughout the day. The noise levels and sources of noise measured at each location are listed in **Table 7: Existing Noise Measurements**.

Site	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
ST-1	Stewart Avenue in front of closest residence to Project Site	66.4	46.3	80.8	9:40 a.m.
ST-2	On Live Oak Avenue directly across from Project Site	74.6	60.3	83.5	8:45 a.m.
ST-3	On Rivergrade Road between Stewart Avenue and Arrow Highway	65.7	51.6	78.5	8:20 a.m.
ST-4	Corner of Joanbridge Street and Baldwin Park Boulevard	67.9	48.3	85.1	9:11 a.m.

Source: Noise measurements taken by Kimley-Horn, December 14, 2023. See **Appendix A** for noise measurement results.

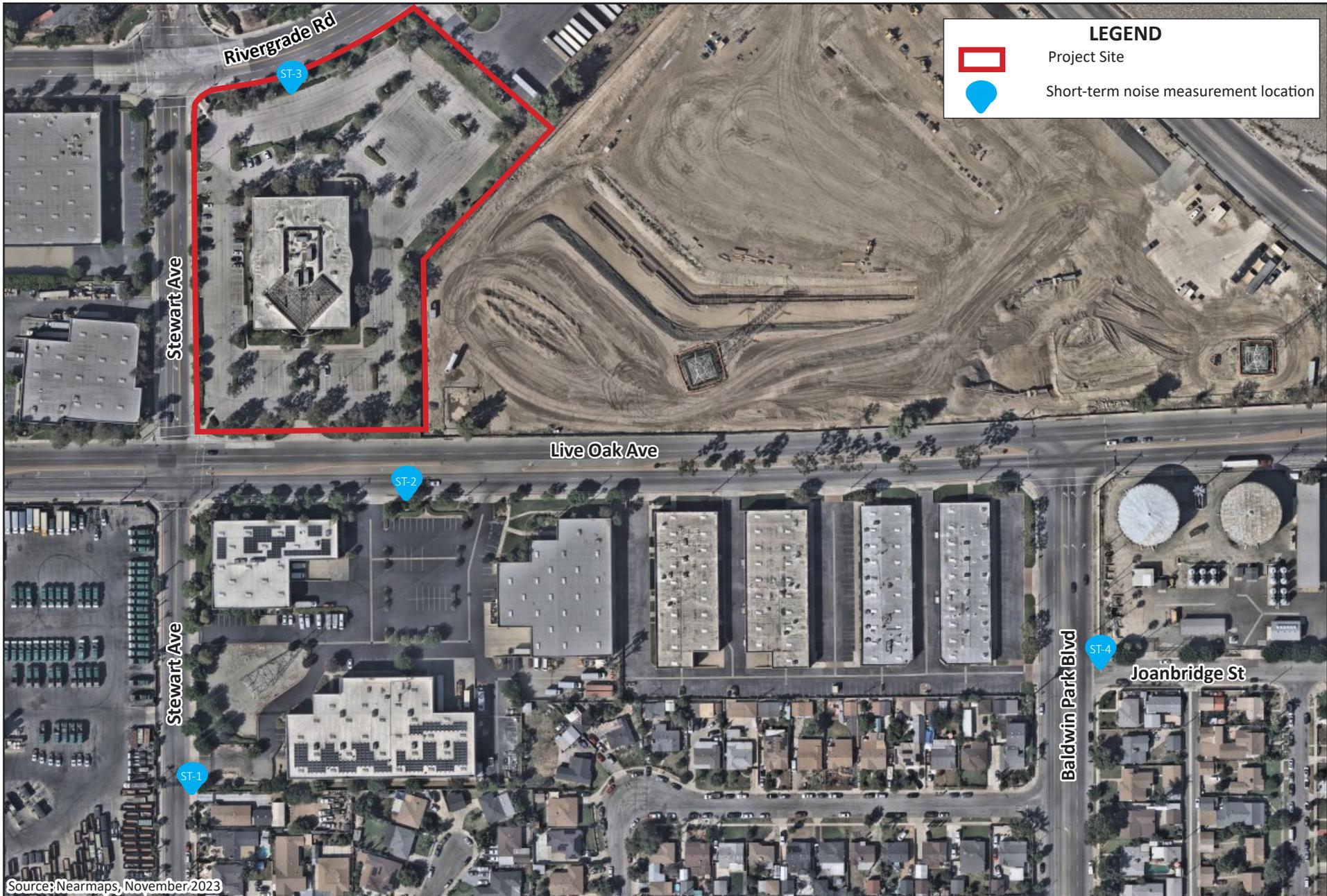


Exhibit 4: NOISE MEASUREMENT LOCATIONS

14005 Live Oak Avenue Project



4.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of noise pollution than is the general population. Sensitive receptors that are in proximity to stationary sources of noise and vibration are of particular concern. Noise sensitive uses typically include residences, hospitals, schools, childcare facilities, and places of assembly. Vibration sensitive receivers are generally similar to noise sensitive receivers but may also include businesses, such as research facilities and laboratories that use vibration-sensitive equipment. Sensitive land uses within 1,000 feet of the Project site consist of single-family residential and multi-family communities located within the City of Baldwin Park. The closest sensitive receptor in the City of Irwindale is the Kare Youth League and Chamberlain University located more than 2,741 feet and 3,000 feet away, respectively. Sensitive land uses nearest to the Project site are shown in **Table 8: Sensitive Receptors** and **Exhibit 5: Sensitive Receptors**.

Table 8: Sensitive Receptors	
Receptor Description	Distance¹ and Direction from the Project
Single-Family Residences ²	445 feet to the southeast
Multi-Family Residences ²	530 feet to the south
Single-Family Residences ²	580 feet to the south
Margaret Heath Elementary School ²	1,995 feet to the southeast
Kare Youth League ³	2,741 feet to the northwest
Chamberlain University ³	3,000 feet to the southwest
1. Distance measured from the Project site boundary to the nearest sensitive receptor property line. 2. Receptors are located within the City of Baldwin Park. 3. Receptors are located within the City of Irwindale	
Source: Google Earth, 2023.	

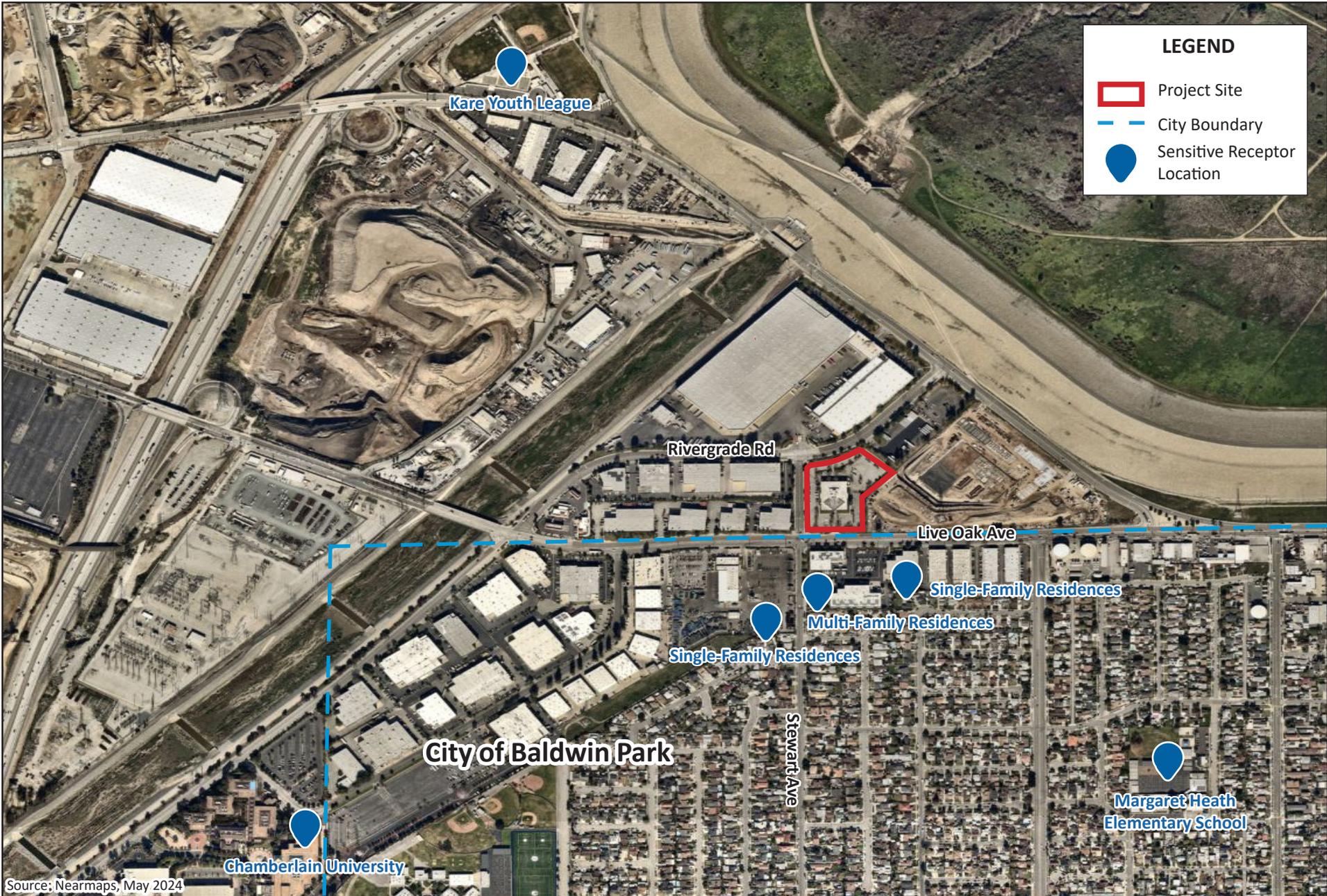


Exhibit 5: SENSITIVE RECEPTORS
 14005 Live Oak Avenue Project



5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA Thresholds

California Environmental Quality Act (CEQA) Guidelines Appendix G contains analysis guidelines related to noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. A project would create a significant environmental impact if it would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generate excessive ground-borne vibration or ground-borne noise levels; and
- For a project 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 public use airport, expose people residing or working in the Project area to excessive noise levels.

5.2 Methodology

Construction

Construction noise levels were based on typical noise levels generated by construction equipment published by the Federal Transit Administration (FTA) and FHWA. Construction noise is assessed in dBA L_{eq} . This unit is appropriate because L_{eq} can be used to describe noise level from operation of each piece of equipment separately, and levels can be combined to represent the noise level from all equipment operating during a given period.

Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

Per the City of Irwindale noise ordinance, if construction activities are within 500 feet of a residential zone, construction activities exceeding 75 dBA ambient base noise levels between 7:00 a.m. and 7:00 p.m. at the property boundary of an industrial zone would be considered a significant impact, unless authorization has been duly obtained beforehand from the building inspector.

The City of Baldwin Park does not have a quantitative threshold for construction noise. Section 130.37 limits the hours of construction between 7:00 a.m. and 7:00 p.m. when within 500 feet of a residential zone.

Operations

The analysis of the Project's noise environment is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the Project's operational noise impacts from stationary sources. Noise levels were collected from published sources from similar types of activities and used to estimate noise levels expected with the Project's stationary sources. The reference noise levels

are used to represent a worst-case noise environment as noise level from stationary sources can vary throughout the day. Operational noise is evaluated based on the standards within the City's noise standards and General Plan.

As mentioned previously, the closest sensitive receptor located in the City of Irwindale is located approximately 2,741 feet northwest of the Project site. Thus, operational noise levels from the Project would not impact any sensitive receptors in the City of Irwindale. However, the Project site is located adjacent to commercial and industrial uses within the City of Irwindale. Per the City of Irwindale General Plan, exterior noise levels of up to 67 dBA CNEL are "conditionally acceptable" for commercial/professional office buildings and industrial land. Additionally, per the City of Irwindale noise ordinance, noise levels exceeding 75 dBA ambient base noise levels between 7:00 a.m. and 10:00 p.m. at the property boundary of an industrial zone would be considered a significant impact.

For sensitive receptors located in the City of Baldwin Park, noise levels must be below 65 dBA CNEL per the Baldwin Park 2020 General Plan and below 55 dBA L_{eq} during the daytime and 45 dBA L_{eq} during the nighttime per the BPMC. For nearby industrial receptors, noise levels must not exceed 70 dBA L_{eq} per the BPMC.

Vibration

Ground-borne vibration levels associated with construction activities for the Project were evaluated utilizing typical ground-borne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential ground-borne vibration impacts related to building/structure damage and interference with sensitive existing operations were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance. Per FTA guidance, a vibration limit of 12.7 millimeters per second (mm/sec; 0.5 inch/sec) PPV is used for buildings that are structurally sound and designed to modern engineering standards. A conservative vibration limit of 5 mm/sec (0.2 inches/sec) PPV has been used for buildings that are found to be structurally sound but where structural damage is a major concern. For historic buildings or buildings that are documented to be structurally weakened, a limit of 2 mm/sec (0.08 inches/sec) PPV is used to provide the highest level of protection.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 Acoustical Impacts

Threshold 6.1 Would the Project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods located to the northwest and southeast of the construction site. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors.

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Typical operating cycles for the construction equipment used in these phases may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping material or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in **Table 9: Typical Construction Noise Levels**.

Equipment	Noise Level (dBA) at 50 feet from Source¹
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	80
Paver	85
Pile-driver (Sonic)	95

Table 9: Typical Construction Noise Levels	
Equipment	Noise Level (dBA) at 50 feet from Source ¹
Pneumatic Tool	85
Pump	77
Roller	85
Saw	76
Scraper	85
Shovel	82
Truck	84

1. Calculated using the inverse square law formula for sound attenuation: $dB_{A_2} = dB_{A_1} + 20\log(d_1/d_2)$ Where: $QWdB_{A_2}$ = estimated noise level at receptor; dB_{A_1} = reference noise level; d_1 = reference distance; d_2 = receptor location distance.

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

Following the FTA’s methodology for quantitative construction noise assessments, the FHWA Roadway Construction Noise Model (RCNM) was used to predict construction noise. The noise levels identified in **Table 10: Project Construction Noise Levels**, show the exterior construction noise at the nearest sensitive receptors, without accounting for attenuation from existing physical barriers.

Section 9.28.110 of the IMC states that if construction activities within 500 feet of a residential zone, exceed 75 dBA ambient base noise levels at the property boundary of an industrial zone, it would be considered a significant impact. The nearest sensitive receptor within the City of Irwindale is located approximately 2,741 feet northwest. At this distance construction noise levels would remain below the IMC Section 9.28.110 construction threshold of 75 dBA. Construction activities may also cause increased noise along site access routes due to movement of equipment and workers. However, compliance with the IMC would minimize impacts from construction noise, as construction would be limited to daytime hours on weekdays and Saturdays.

The City of Baldwin Park does not have a quantitative construction noise standard. Therefore, the FTA Transit Noise and Vibration Impact Assessment Manual’s (2018) (FTA Noise and Vibration Manual) maximum 8-hour noise level standard of 80 dBA L_{eq} at residential uses for short-term construction activities is utilized for the receptors located in the City of Baldwin Park. As shown in **Table 10**, the highest exterior noise level at the nearest sensitive receptors would occur during the site preparation and building construction stage of construction and would be 68.6 dBA and 70.1 dBA, respectively. Therefore, construction noise levels would not exceed the FTA’s construction noise standards of 80 dBA L_{eq} at the City of Baldwin Park receptors. Further, the Project would be consistent with Section 130.37 of the BPMC which restricts construction from occurring within 500 feet of a residential zone between the hours of 7:00 p.m. and 7:00 a.m.

As discussed above, construction noise levels associated with the Project would not exceed the FTA’s construction noise standards or the IMC Section 9.28.110 construction noise threshold and would be required to comply with the Baldwin Park and Irwindale Municipal Code standards. Therefore, the Project would result in a less than significant construction noise impact.

Table 10: Project Construction Noise Levels

Construction Phase	Receptor Location			Worst Case Modeled Noise Level, dBA L_{eq} (8-hour) ²	Noise Standard, dBA L_{eq} ^{3,4}	Exceeded?
	Land Use	Distance (feet) ¹	Direction			
Demolition	Residential	445	Southeast	67.5	80	No
	Residential	530	South	65.9	80	No
	Residential	580	South	65.2	80	No
	School	1,995	Southeast	54.4	80	No
Site Preparation	Residential	445	Southeast	68.6	80	No
	Residential	530	South	67.1	80	No
	Residential	580	South	66.3	80	No
	School	1,995	Southeast	55.6	80	No
Grading	Residential	445	Southeast	68.3	80	No
	Residential	530	South	66.8	80	No
	Residential	580	South	66.0	80	No
	School	1,995	Southeast	55.2	80	No
Paving	Residential	445	Southeast	67.5	80	No
	Residential	530	South	66.0	80	No
	Residential	580	South	65.2	80	No
	School	1,995	Southeast	54.5	80	No
Building Construction	Residential	445	Southeast	70.1	80	No
	Residential	530	South	68.6	80	No
	Residential	580	South	67.8	80	No
	School	1,995	Southeast	57.0	80	No
Architectural Coating	Residential	445	Southeast	54.7	80	No
	Residential	530	South	53.2	80	No
	Residential	580	South	52.4	80	No
	School	1,995	Southeast	57.0	80	No

1. Distance measured from the location of the Project site boundary to the receptor's nearest property line.
 2. Modeled noise levels conservatively assume the simultaneous operation of all pieces of equipment.
 3. The FTA Noise and Vibration Manual establishes construction noise standards of 80 dBA L_{eq} (8-hour) for residential uses.

Source: Irwindale Municipal Code, 2022. Refer to **Appendix A** for noise modeling results

Operations

Implementation of the Project would create new sources of noise in the vicinity of the Project site. The major noise sources associated with the Project including the following:

- Mechanical equipment (i.e., trash compactors, air conditioners, etc.);
- Parking areas (i.e., car door slamming, car radios, engine start-up, and car pass-by);
- Loading dock activities (i.e., slow moving trucks on the site, maneuvering and idling trucks, air brakes, backup beepers, equipment noise) and;
- Off-site traffic noise

Mechanical Equipment. Potential stationary noise sources related to long-term operation of the Project site would include mechanical equipment. Mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA L_{eq} at 50 feet.⁹ The closest commercial/industrial receptor in the City of Irwindale is located approximately 250 feet to the west of the proposed building. At this distance, noise levels from mechanical equipment would reach 38.0 dBA L_{eq} which is below the 75 L_{eq} dBA standard.

At the closest sensitive receptor in the City of Baldwin Park (the single-family residences located approximately 745 feet southeast of on-site mechanical equipment), mechanical equipment noise would attenuate to 28.5 dBA L_{eq} and would not exceed the City of Baldwin Park's allowable noise levels of 55 dBA L_{eq} during the daytime and 45 dBA L_{eq} during the nighttime for residential uses. The closest industrial receptor in the City of Baldwin Park is located approximately 370 feet south and would experience a noise level of 34.6 dBA L_{eq} which would not be above the 70 dBA L_{eq} standard for industrial uses. Therefore, noise associated with the Project's mechanical equipment would be less than significant.

Truck and Loading Dock Noise. During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. Loading dock noise is approximately 64 dBA L_{eq} at 50 feet.¹⁰ The closest commercial/industrial receptor in the City of Irwindale is located approximately 350 feet to the west of the proposed loading docks. At this distance, noise levels from mechanical equipment would reach 47.5 dBA L_{eq} which is below the 75 L_{eq} dBA standard.

At the closest sensitive receptor in the City of Baldwin Park (the single-family residences located approximately 745 feet southeast of loading docks), loading dock noise levels would be 40.9 dBA L_{eq} and would not exceed the City of Baldwin Park's allowable noise levels of 55 dBA L_{eq} during the daytime and 45 dBA L_{eq} during the nighttime for residential uses. The closest industrial receptor in the City of Baldwin Park is located approximately 410 feet south and would experience a noise level of 46.1 dBA L_{eq} which would not be above the 70 dBA L_{eq} standard for industrial uses.

Furthermore, loading dock doors would be surrounded with protective aprons, gaskets, or similar improvements that, when a trailer is docked, would serve as a noise barrier between the interior warehouse activities and the exterior loading area. This would attenuate noise emanating from interior activities, and as such, interior loading and associated activities would be permissible during all hours of the day. Therefore, the Project would result in a less than significant impact related to stationary noise levels.

Parking Lot Noise. The Project would provide 64 parking stalls for passenger vehicles and 13 electronic vehicle (EV) spaces. Parking stalls would be located throughout the Project site. Nominal parking noise would occur within the on-site parking facilities. Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine

⁹ Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

¹⁰ Loading docks reference noise level measurements conducted by Kimley-Horn on December 18, 2018. Loading dock activities included trucks arriving at the docks, backing up, and loading/unloading using pallet jack.

starting up, and car pass-bys range from 53 to 61 dBA L_{eq} ¹¹ at 50 feet and may be an annoyance to adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to nearby sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA L_{eq} at 50 feet for very loud speech.¹² It should be noted that parking lot noises are instantaneous noise levels compared to noise standards in the hourly L_{eq} metric, which are averaged over the entire duration of a time period.

Parking lot noise would occur at the surface parking lot on-site and would attenuate to approximately 48.0 dBA L_{eq} at the nearest industrial receptors located 280 feet west of the Project parking area and would not exceed the City of Irwindale's noise standard of 75 dBA L_{eq} . At the closest sensitive receptor in the City of Baldwin Park (the single-family residences located approximately 540 feet southeast of parking area), parking area noise levels would be 42.3 dBA L_{eq} and would not exceed the City of Baldwin Park's allowable noise levels of 55 dBA L_{eq} during the daytime and 45 dBA L_{eq} during the nighttime for residential uses. The closest industrial receptor in the City of Baldwin Park is located approximately 170 feet south and would experience a noise level of 52.4 dBA L_{eq} which would not be above the 70 dBA L_{eq} standard for industrial uses.

Furthermore, parking lot noise also currently occurs at the adjacent properties under existing conditions and would be consistent with the existing noise in the vicinity and would be partially masked by background noise from traffic along area roadways. Noise associated with parking lot activities is not anticipated to exceed the City's noise standards during operation. Therefore, noise impacts from parking lots would be less than significant.

Combined Noise Levels. Project operations could potentially result in simultaneous noise generating activities associated with the mechanical equipment, truck loading area, and parking lot area. The combined noise level associated with the simultaneous operation of all on-site noise sources at the nearest commercial/industrial receptor in the City of Irwindale would be approximately 51.0 dBA L_{eq} and would not exceed the City of Irwindale's noise standard of 75 dBA L_{eq} . At the closest sensitive receptor in the City of Baldwin Park (the single-family residences) the combined noise level would be approximately 44.8 dBA L_{eq} and would not exceed the City of Baldwin Park's allowable noise levels of 55 dBA L_{eq} during the daytime and 45 dBA L_{eq} during the nighttime for residential uses. Furthermore, the combined noise levels at the nearest industrial receptor in the City of Baldwin Park would be 53.4 L_{eq} and would not exceed the 70 dBA L_{eq} standard for industrial uses. Therefore, noise impacts associated with the simultaneous operation of all on-site noise sources would be less than significant.

Off-Site Traffic Noise. Implementation of the Project would generate increased traffic volumes along nearby roadway segments. Traffic data provided by *Traffic Impact Analysis* (Environmental Planning Development Solutions, Inc., 2023) shows that the proposed Project would generate 174 daily trips which would result in noise increases on Project area roadways. In general, a traffic noise increase of less than 3 dBA is barely perceptible to people, while a 5-dBA increase is readily noticeable.¹³ Generally, traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise

¹¹ Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

¹² Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, 2015.

¹³ Federal Highway Administration, *Highway Traffic Noise Analysis and Abatement Policy and Guidance, Noise Fundamentals*, https://www.fhwa.dot.gov/Environment/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed January 3, 2024.

levels to increase by 3 dBA. Therefore, permanent increases in ambient noise levels of less than 3 dBA are considered to be less than significant.

According to the City of Irwindale General Plan, the average daily traffic along Live Oak Avenue, west of Arrow Highway (the closest study road segment to the Project site) is 27,300 vehicles. Therefore, the Project would not generate sufficient traffic to double existing volumes and result in a permanent 3-dBA increase in ambient noise levels. Noise impacts associated with traffic would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.2 Would the Project generate excessive ground-borne vibration or ground-borne noise levels?

Increases in ground-borne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. Construction on the Project site would have the potential to result in varying degrees of temporary ground-borne vibration, depending on the specific construction equipment used and the operations involved.

The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations in their 2018 *Transit Noise and Vibration Impact Assessment Manual*. The types of construction vibration impacts include human annoyance and building damage. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 in/sec) appears to be conservative. The types of construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time (0.20 in/sec annoyance threshold).¹⁴ Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage.

The nearest structure to the Project site is the Price Impact Wholesale building located approximately 45 feet to the west. **Table 11: Typical Construction Equipment Vibration Levels**, lists vibration levels at 25 feet and 45 feet for typical construction equipment. Ground-borne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in **Table 11**, based on FTA data, vibration velocities from typical heavy construction equipment operations that could be used during Project construction range from 0.001 to 0.087 in/sec PPV at 45 feet from the source of activity (the distance from active construction zone to the nearest structure to the west), which is below the FTA's 0.20 PPV threshold for structural damage and Caltrans threshold for

¹⁴ California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, Table 5, April 2020.

annoyance. Therefore, vibration impacts associated with the Project construction would be less than significant.

Table 11: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 45 Feet (in/sec) ¹
Vibratory Roller	0.210	0.087
Large Bulldozer	0.089	0.037
Loaded Trucks	0.076	0.032
Small Bulldozer/ Tractors	0.003	0.001

1. Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

Once operational, the Project would not be a significant source of ground-borne vibration. Ground-borne vibration surrounding the Project currently results from heavy-duty vehicular travel (e.g., refuse trucks, heavy duty trucks, delivery trucks, and transit buses) on the nearby local roadways. Operations of the Project would include periodic truck activities. Due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity. According to the FTA’s Transit Noise and Vibration Impact Assessment, trucks rarely create vibration levels that exceed 70 VdB (equivalent to 0.012 inches per second PPV) when they are on roadways. Therefore, trucks operating at the Project site or along surrounding roadways would not exceed FTA thresholds for building damage or annoyance. Impacts would be less than significant in this regard.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.3 For a Project 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 public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

The nearest airport to the Project site is the San Gabriel Valley Airport in El Monte, a public use strip, located approximately four miles to the west. The Project site is not within 2 miles of a public airport or private airfield, or identified within an airport land use plan. Further, there are not any specific flight corridors that overfly the City. During field surveys conducted in the City, helicopter operations were observed within the vicinity of the Santa Fe Dam, however, no observation of helicopters were made during Project field visits. Therefore, the Project would not expose people residing or working in the Project area to excessive airport- or airstrip-related noise levels and no mitigation is required.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

6.2 Cumulative Noise Impacts

Cumulative Construction Noise

The Project's construction activities would not result in a substantial temporary increase in ambient noise levels. Construction noise would be periodic and temporary noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction Project noise impacts if construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant by implementing the City of Irwindale Municipal Code.

Construction activities at other planned and approved projects near the Project site would be required to comply with applicable City rules related to noise and would take place during daytime hours on the days permitted by the applicable Municipal Code, and projects requiring discretionary City approvals would be required to evaluate construction noise impacts, comply with the City's standard conditions of approval, and implement mitigation, if necessary, to minimize noise impacts. Construction noise impacts are by nature localized. Based on the fact that noise dissipates as it travels away from its source, noise impacts would be limited to the Project site and vicinity. Therefore, Project construction would not result in a cumulatively considerable contribution to significant cumulative impacts, assuming such a cumulative impact existed, and impacts in this regard are not cumulatively considerable.

Cumulative Operational Noise

Cumulative Off-Site Traffic Noise. Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the proposed Project and other foreseeable projects. Cumulative noise impacts generally occur as a result of increased traffic on local roadways due to buildout of the Project and other projects in the vicinity. However, the Project is projected to result in 174 new daily vehicular trips and would result in a minimal traffic noise increase (less than 3.0 dBA) along local roadways. Therefore, the Project's contribution would not be cumulatively considerable.

Cumulative Stationary Noise. Stationary noise sources of the Project would not result in an incremental increase in non-transportation noise sources in the vicinity of the site. Therefore, operational noise caused

by the proposed Project would be less than significant. Similar to the Project, other planned and approved projects would be required to mitigate for stationary noise impacts at nearby sensitive receptors, if necessary. As stationary noise sources are generally localized, there is a limited potential for other projects to contribute to cumulative noise impacts.

No known present or reasonably foreseeable projects would combine with the operational noise levels generated by the Project to increase noise levels above acceptable standards because each project must comply with applicable City regulations that limit operational noise. Therefore, the Project, together with other projects, would not create a significant cumulative impact, and even if there was such a significant cumulative impact, the Project would not make a cumulatively considerable contribution to significant cumulative operational noises.

Given that noise dissipates as it travels away from its source, operational noise impacts from on-site activities and other stationary sources would be limited to the Project site and immediate vicinity. Thus, cumulative operational noise impacts from related projects, in conjunction with project-specific noise impacts, would not be cumulatively significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

7 REFERENCES

1. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2020.
2. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
3. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020.
4. City of Baldwin Park, *Baldwin Park 2020 General Plan*, 2002.
5. City of Baldwin Park, *Municipal Code*, 2023.
6. City of Irwindale, *General Plan*, 2020.
7. City of Irwindale, *Municipal Code*, 2022.
8. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
9. Environment Planning Development Solutions, Inc., *Live Oak Irwindale Traffic Impact Analysis*, August 2023.
10. Federal Highway Administration, *Noise Fundamentals*, 2017.
11. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
12. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
13. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
14. James P. Cowan, *Handbook of Environmental Acoustics*, 1994.
15. Kariel, H. G., *Noise in Rural Recreational Environments*, *Canadian Acoustics* 19(5), 3-10, 1991.

Appendix A

NOISE DATA

Noise Source	Reference Level (dBA)	Reference Distance (feet)	Distance to Receptor (feet)	Level at Receptor (dBA) ⁴	Significant?
Mechanical Equipment ¹	52	50	250	38.0	No
Mechanical Equipment ¹	52	50	370	34.6	No
Mechanical Equipment ¹	52	50	745	28.5	No
Truck and Loading Docks ²	64.4	50	350	47.5	No
Truck and Loading Docks ²	64.4	50	410	46.1	No
Truck and Loading Docks ²	64.4	50	745	40.9	No
Parking ³	63	50	280	48.0	No
Parking ³	63	50	170	52.4	No
Parking ³	63	50	540	42.3	No

1. Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

2. Loading dock reference noise level measurements conducted by Kimley-Horn on December 18, 2018.

3. Source for reference level: Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

4. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20\text{Log}(d_1/d_2)$, where dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance.

Project: **14005 Live Oak Avenue Project**

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours: Daytime hours (7 am to 10 pm)
 Evening hours (7 pm to 10 pm)
 Nighttime hours (10 pm to 7 am)

Leq to L10 factor

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Single-Family Residences	445	0	SE
2	Multi-Family Residences	530	0	S
3	Single-Family Residences	580	0	S
4	Margaret Heath Elementary School	2,000	0	SE

Construction Phase	Equipment Type	No. of Equip.	Acoustical Usage Factor	Reference Noise Level at 50ft per Unit, Lmax	RECEPTOR 1		RECEPTOR 2		RECEPTOR 3		RECEPTOR 4	
					Noise Level at Receptor 1, Lmax	Noise Level at Receptor 1, Leq	Noise Level at Receptor 2, Lmax	Noise Level at Receptor 2, Leq	Noise Level at Receptor 3, Lmax	Noise Level at Receptor 3, Leq	Noise Level at Receptor 4, Lmax	Noise Level at Receptor 4, Leq
Demolition												
	Dozer	2	40%	82	65.7	61.7	64.2	60.2	63.4	59.4	52.7	48.7
	Excavator	3	40%	81	66.5	62.5	65.0	61.0	64.2	60.2	53.4	49.5
	Concrete Saw	1	20%	90	70.6	63.6	69.1	62.1	68.3	61.3	57.6	50.6
	Combined LEQ					67.5		65.9		65.2		54.4
Site Preparation												
	Dozer	3	40%	82	67.5	63.5	66.0	62.0	65.2	61.2	54.4	50.5
	Tractor	4	40%	84	71.0	67.1	69.5	65.5	68.7	64.8	58.0	54.0
	Combined LEQ					68.6		67.1		66.3		55.6
Grading												
	Grader	1	40%	85	66.0	62.0	64.5	60.5	63.7	59.7	53.0	49.0
	Excavator	1	40%	81	61.7	57.7	60.2	56.2	59.4	55.4	48.7	44.7
	Tractor	3	40%	84	69.8	65.8	68.3	64.3	67.5	63.5	56.7	52.8
	Dozer	1	40%	82	62.7	58.7	61.2	57.2	60.4	56.4	49.7	45.7
	Combined LEQ					68.3		66.8		66.0		55.2

Building Construction												
	Man Lift	6	20%	75	63.5	56.5	62.0	55.0	61.2	54.2	50.4	43.5
	Generator	2	50%	81	64.6	61.6	63.1	60.1	62.3	59.3	51.6	48.6
	Crane	2	16%	81	64.6	56.7	63.1	55.1	62.3	54.4	51.6	43.6
	Welder/Torch	2	40%	74	58.0	54.0	56.5	52.5	55.7	51.7	45.0	41.0
	Tractor	6	40%	84	72.8	68.8	71.3	67.3	70.5	66.5	59.7	55.8
	Combined LEQ				70.1	68.6		68.6	67.8		57.0	
Paving												
	Paver	2	50%	77	61.2	58.2	59.7	56.7	58.9	55.9	48.2	45.2
	Pavement Scarafier	2	20%	90	73.5	66.5	72.0	65.0	71.2	64.2	60.5	53.5
	Roller	2	20%	80	64.0	57.0	62.5	55.5	61.7	54.7	51.0	44.0
	Combined LEQ				67.5	66.0		66.0	65.2		54.5	
Architectural Coating												
	Compressor (air)	1	40%	78	58.7	54.7	57.2	53.2	56.4	52.4	45.7	41.7
	Combined LEQ					54.7		53.2	52.4		41.7	

Source for Ref. Noise Levels: RCNM, 2005