Shady View Residential Project

Noise Assessment Study

April 2022 | 01194.00002.001

Prepared for:

City of Chino Hills
Community Development Department
14000 City Center Drive
Chino Hills, CA 91709

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

This page intentionally left blank

TABLE OF CONTENTS

Section **Page**

TABLE OF CONTENTS (cont.)

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
ANSI	American National Standards Institute
APN	Assessor's Parcel Number
CAD	Computer Aided Design
CadnaA	Computer Aided Noise Abatement
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Chino Hills
CNEL	Community Noise Equivalent Level
CY	cubic yard
dB	decibel
dBA	A-weighted decibels
DU	dwelling unit
FTA	Federal Transit Administration
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
kHz	kilohertz
L_{DN}	Day-Night level
L_{EQ}	equivalent sound level
L_{MAX}	maximum noise level
mPa	micro-Pascals
mph	miles per hour
NSLU	noise-sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
RMS	root mean square velocity
SPL	sound pressure level
STC	Sound Transmission Class
S_{WL}	sound power level
TNM	Traffic Noise Model
TS	Traffic Study

ACRONYMS AND ABBREVIATIONS

USDOT	U.S. Department of Transportation
VdB	vibration decibels

EXECUTIVE SUMMARY

This report presents an assessment of potential noise impacts and noise/land use compatibility associated with the proposed Shady View Residential Project (project) in the City of Chino Hills (City). The project area totals approximately 130 acres and is in the southeastern portion of the City at the southern termini of Shady View Drive and Via La Cresta, south of the existing Butterfield Ranch residential development. The Project would develop a residential subdivision consisting of 159 single-family residential homes, a community recreation center, private interior streets, debris basins, utility infrastructure, and other associated improvements.

Anticipated construction activities would generate temporary elevated noise levels for nearby noise sensitive land uses (NSLUs). Noise levels from construction equipment may exceed the noise limits set by the City and would be potentially significant. Mitigation measure NOI-1 would reduce construction noise impacts to less than significant levels.

The project's heating, ventilation, and air conditioning (HVAC) systems would not exceed the City Municipal Code noise limits measured at the nearest off-site residential property lines. The addition of project-generated traffic to nearby roadways, would not result in a significant increase in ambient noise levels along project-affected roadways.

Construction would not generate ground-borne vibration exceeding the City standard. Once operational, the project would not constitute a significant source of vibration.

The project site is not within the airport influence area, or within the 65 CNEL noise contours for the Corona Municipal Airport, Chino Airport, or the Ontario International Airport. Persons living or working in the project would not be exposed to substantial noise levels from aircraft or airport operations.

Future residential units and exterior use areas would be exposed to noise from vehicular traffic along State Route 71. Noise levels at residential exterior use areas would exceed the 65 CNEL exterior limit set forth in the City's General Plan Noise Element for lots along the east side of the project. Interior noise levels for lots along the east side of the project may exceed the City's standard of 45 CNEL. Incorporation of compliance measure NOI-2, requiring acoustic barriers for affected lots, and NOI-3 requiring minimum sound transmission class (STC) ratings for residential building exterior walls and windows for affected lots, would reduce noise levels for project residences to below the City standards.

This page intentionally left blank

1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report analyzes potential noise and vibration impacts associated with the proposed Shady View Residential Project (project). The analysis includes a description of existing conditions in the project vicinity and an assessment of potential impacts associated with project implementation. Analysis within this report addresses the relevant issues listed in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. This report also includes an assessment of the proposed project's compatibility with the General Plan Noise Element.

1.2 PROJECT LOCATION

The project is located within the City of Chino Hills (City), east of Chino Hills State Park, and west of State Route 71 (SR 71). The City's corporate boundary and the San Bernardino County/Riverside County boundary are adjacent to the east of the project site. The site is in the southeastern portion of the City at the southern termini of Shady View Drive and Via La Cresta, south of the existing Butterfield Ranch residential development. (See Figure 1, *Regional Location*, and Figure 2, *Aerial Photograph.*)

1.3 PROJECT DESCRIPTION

The 130-acre project site (Assessor's Parcel Number [APN] 1057-261-06) is roughly rectangular, with a square cut-out parcel in the east portion of the site that is not part of the project site. The proposed project would develop a single-family residential subdivision consisting of 159 single-family residential homes, a community recreation center, interior streets, storm water control basins, utility infrastructure, and other associated improvements. Additionally, the project includes approximately 72 acres of homeowners' association-maintained open space. The project proposes the development of six different single-family residential unit types, with dwelling square footage ranging from 2,381 square feet (SF) up to a maximum size of 3,888 SF. The project proposes 53 single-story homes and 106 two-story homes for a total of 159 dwelling units (DU; see Figure 3, *Site Plan*).

The project site contains three existing aboveground storage tanks and associated pipelines related to oil exploration activities that are located on adjacent property to the west and northwest (see Figure 2 for the existing tank locations). The project would include the removal of the tanks and associated pipelines, and the construction of replacement tanks and pipelines near the western project boundary. See Figure 3 for the proposed location of the tanks. Site work and grading is expected to occur west of the proposed residential development to allow for stabilization of the existing earthquake fault and relocation of existing oil storage tanks and existing oil transmission lines. The relocated aboveground oil storage tanks are proposed in the northwestern portion of the project site on a 1.27-acre lot, near the western project boundary and west of the proposed residential structures. The relocated pipelines would connect the new tanks with the existing oil facilities to the west of the project site.

The project would include extensions of Via La Cresta and Shady View Drive from their existing termini in the Butterfield Ranch development to the north. Via La Cresta and Shady View Drive would provide the two access points into the proposed development. The extension of these roadways would be private, and the project includes the construction of 11 internal private streets to provide access throughout the development.

The proposed project is designed with a land use and density consistent with the City of Chino Hills General Plan and Chino Hills Zoning Code. The existing General Plan land use designation is split between two residential land uses, Agriculture Ranch and Low Density Residential. In addition, the zoning for the property is split between two residential zoning districts, R-S Low Density Residential and R-A Agriculture/Ranches. The location of the split occurs at the same location for both land use and zoning. As proposed, all residential development would occur in the Low-Density Residential land use designated, R-S zoned portion of the site.

1.4 NOISE/SOUND LEVEL AND VIBRATION DESCRIPTORS AND TERMINOLOGY

1.4.1 Noise Descriptors

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

1.4.2 Noise Terminology

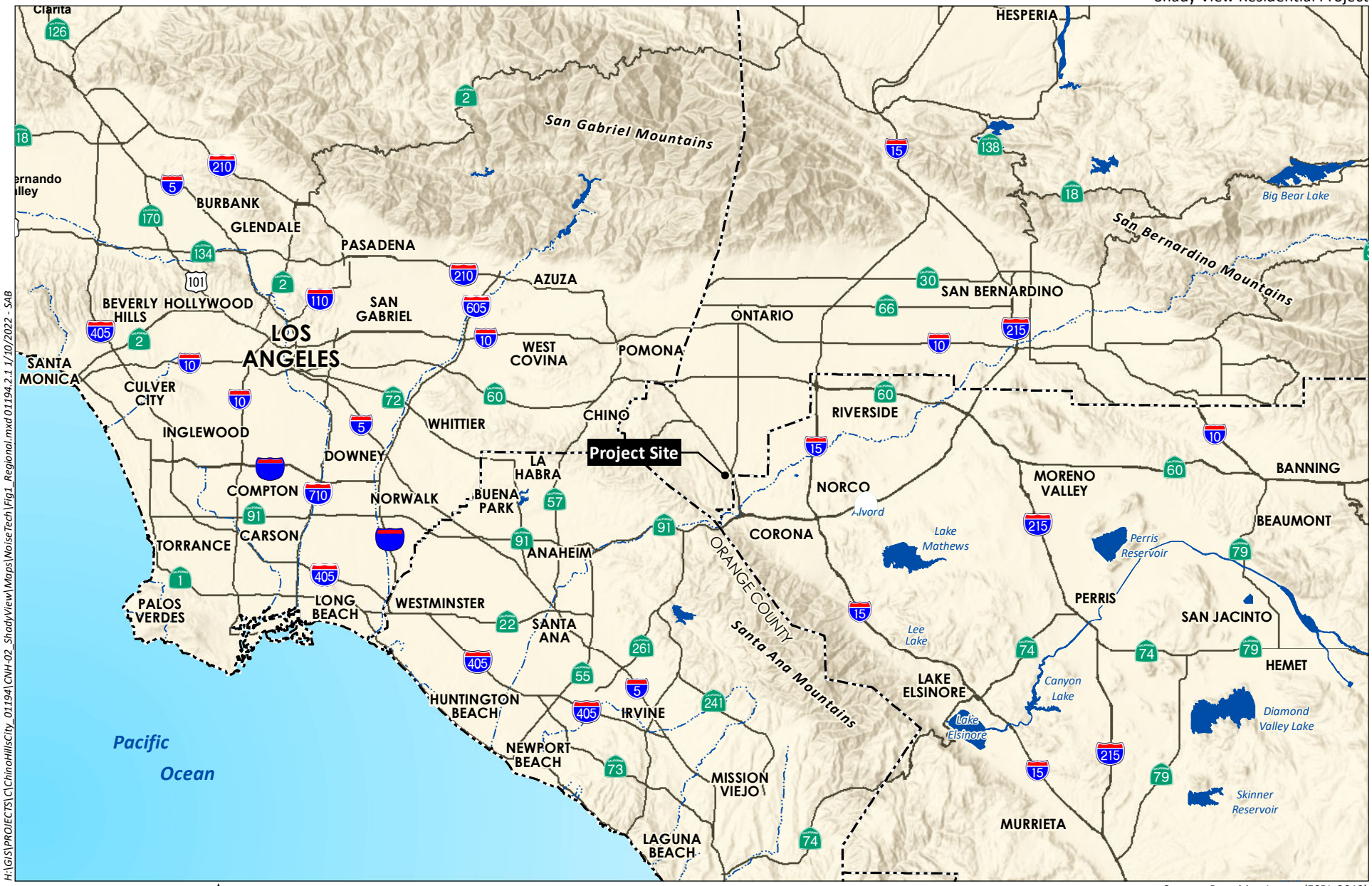
1.4.2.1 Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

1.4.2.2 Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.



H:\GIS\PROJECTS\CIC\ChinoHillsCity_01194\CNH-02_ShadyView\Maps\NoiseTech\Fig1_Regional.mxd 01194.2.1 1/10/2022 - SAB

0 10 Miles

Source: Base Map Layers (ESRI, 2013)

HELIX Environmental Planning

Regional Location

Figure 1

Shady View Residential Project

H:\GIS\PROJECTS\C\ChinoHillsCity_01194\CNH-02_ShadyView\Maps\NoiseTech\Fig2_Aerial.mxd 01194.2.1 3/31/2022 - SAB

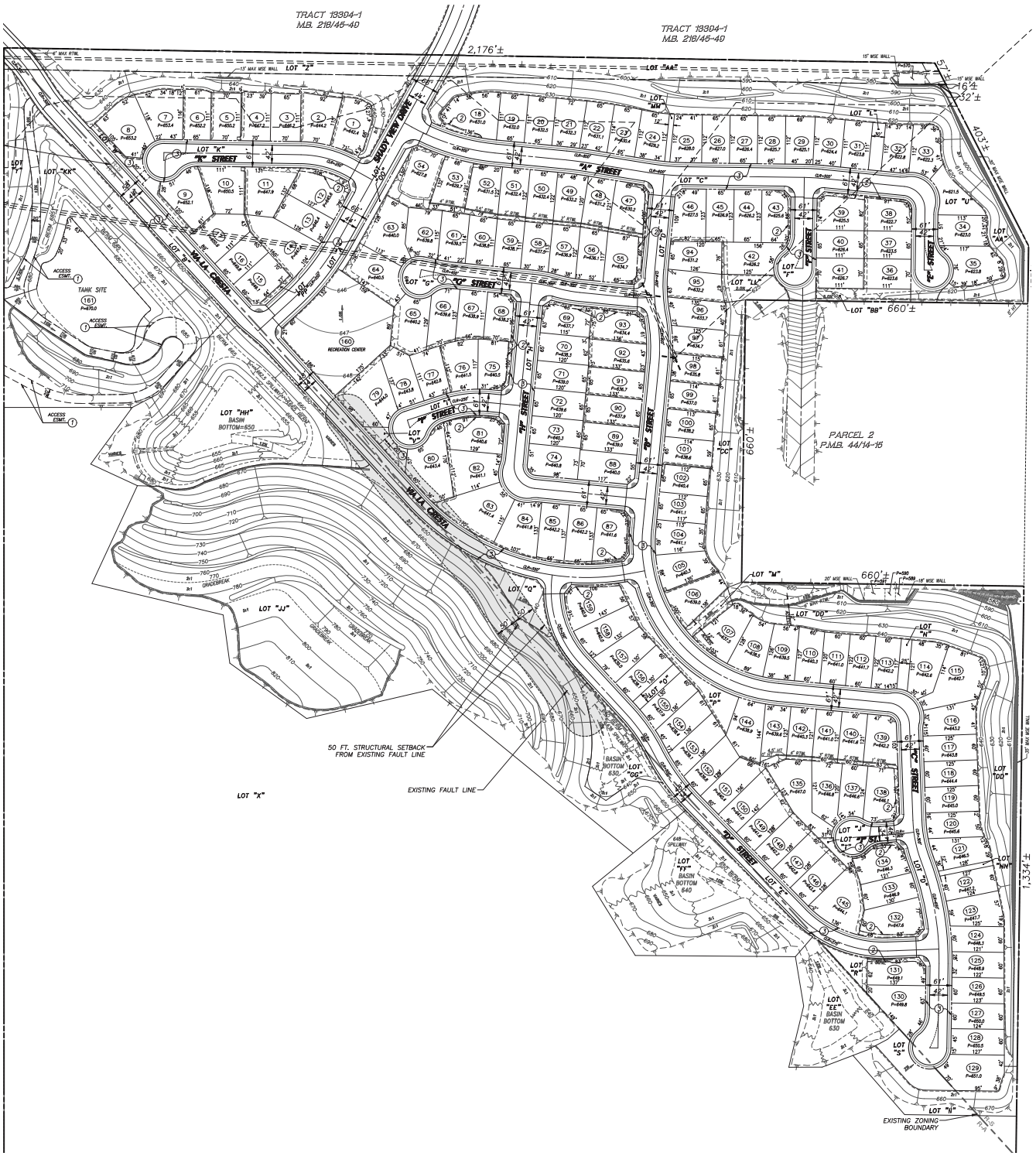
0 400 Feet

Source: Aerial (NAIP, 2018)

HELIX Environmental Planning

Aerial Photograph

Figure 2



H:\GIS\PROJECTS\C\ChinoHillsCity_01194\CNH-02_ShadyView\Maps\NoiseTech\Fig3_SitePlan.indd 01194.2.1 1/10/22 - SAB

Source: Hunsaker and Associates 2021

HELIX
Environmental Planning

Site Plan

Figure 3

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (S_{PL}) in terms of dBA. The threshold of hearing for the human ear is about 0 dBA.

Manufacturers often rate the noise produced by their equipment using sound power level (S_{WL}). S_{WL} is a measure of the acoustic energy emitted from a source of noise and is not dependent on distance. S_{WL} combined with distance to a receiver and proximity to sound reflecting or absorbing objects (such as the ground) can be used to calculate the S_{PL} at the receiver location.

1.4.2.3 Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through standard arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA 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 dBA higher than from one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dBA changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness. A doubling of traffic volume without a change in traffic speed results in an approximate doubling in noise energy and a 3 dBA increase in traffic noise.

1.4.3 Vibration Descriptors

Groundborne vibration consists of rapidly fluctuating motions or waves transmitted through the ground with an average motion of zero. Sources of groundborne vibrations include natural phenomena and anthropogenic causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Peak particle velocity (PPV) and root mean square velocity (RMS) are commonly used to quantify vibration amplitude. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and is commonly used to evaluate groundborne vibrations affecting structure. The RMS is related to the instantaneous energy of a vibration wave and is commonly used in evaluation of human perception of groundborne vibrations. For most ground borne vibrations (with sinusoidal wave forms), the RMS is equal to 0.707 times the PPV. PPV and RMS can be expressed as a velocity (e.g., inches per second) or as vibration decibel (VdB). For the purposes of this analysis, RMS descriptors with units of inches per second are used to evaluate construction-generated vibrations.

1.5 NOISE-SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, including residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. Noise receptors are individual locations that may be affected by noise. NSLUs in the project vicinity include single-family residences in the Butterfield Ranch development north of the project site, and a single-family rural residence located within the square cutout in along the project eastern boundary. The closest NSLUs to the project site are multiple single-family residences in the Butterfield Ranch development, adjacent to the project's northern boundary. The closest school to the project site is the Butterfield Ranch Elementary School, located on Mystic Canyon Drive approximately 940 feet northwest of the project site. There are no hospitals, hotels, resorts, libraries, or sensitive wildlife habitat within one mile of the project site.

1.6 REGULATORY FRAMEWORK

1.6.1 Federal Transit Administration

The Federal Transit Administration (FTA) provides guidelines evaluating the noise and vibration impacts of transportation projects in the *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018). Included in these guidelines are methods/criteria for determining the significance of increases in ambient noise levels as a result of a project increasing traffic levels on existing roads.

1.6.2 California Noise Control Act

The California Noise Control Act is a section within the California Health and Safety Code that describes excessive noise as a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

1.6.3 City of Chino Hills General Plan, Noise Element

In February 2015, the City Council certified the General Plan Update EIR, adopting the 2015 General Plan. The City's General Plan Noise Element establishes noise compatibility guidelines for land uses affected by noise, reproduced here as Table 1, *Land Use Noise/Compatibility Matrix*. The purpose of the Noise Element is to define the City's role and responsibility in safeguarding against noise pollution, and to reduce the negative impacts of noise on future developments by identifying major noise sources and compatible land uses. The acceptable noise levels for the project and surrounding residential land uses are 65 CNEL for exterior spaces and 45 CNEL for interior habitable spaces (City 2015). The acceptable exterior noise level for schools and parks is 65 CNEL.

Table 1
LAND USE/NOISE COMPATIBILITY MATRIX

Categories	Compatible Uses	Interior[1] CNEL	Exterior[2] CNEL
Residential	Single-Family, Duplex, Multiple-Family	45[3]	65[5]
	Mobile Homes	-	65[4]
Commercial	Hotel, Motel, Transient Lodging	45[3]	65
	Commercial, Retail, Bank, Restaurant, Health Clubs	55	-
	Office Buildings, Research and Development, Professional Offices	50	-
	Amphitheater, Concert Hall, Auditorium, Meeting Hall, Movie Theater	45	-
	Gymnasium (multi-purpose)	50	-
	Manufacturing, Warehousing, Wholesale, Utilities	65	-
Open Space	Parks	-	65
Institutional/Public Facility	Hospital, Schools, Classrooms	45[3]	65
	Churches, Libraries	45[3]	-

Source: City 2015

[1] Interior environment excludes bathrooms, toilets, closets, and corridors.

[2] Outdoor environments are limited to the private yard of a single-family or multifamily residential private patio that is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.

[3] Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to UBC requirements.

[4] Exterior noise level shall be such that interior noise level will not exceed 45 CNEL.

[5] Multifamily developments with balconies that do not meet the 65 CNEL standard are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

1.6.4 City of Chino Hills Municipal Code

The City's municipal code provides, among other things, a basis for controlling excessive and annoying noise. The following ordinance sections, as adopted by the City Council as Municipal Code Amendment 21MCA02, December 14, 2021, would be applicable to the project (City 2021):

8.08.020 – Regulation of construction noise.

A. Except when necessary for the immediate preservation of life, health, or property, no person shall construct, repair, remodel, demolish, or grade any real property or structures thereon at any time other than between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays. Notwithstanding the foregoing, an individual residential property owner or tenant in addition to the above permissible hours of construction may also construct, repair, or remodel his or her real property or any structure on such property during the hours of 7:00 p.m. and 10:00 p.m. on weekdays and between 6:00 p.m. and 10:00 p.m. on Saturdays, and between the hours of 8:00 a.m. and 10:00 p.m. on Sundays and federal holidays provided that the noise or sounds associated with such activities cannot be heard by a reasonable person beyond the boundary lines of the property.

16.48.020 - Noise.

Table 2
EXTERIOR NOISE STANDARDS FOR RECEIVING LAND USES

Zone	Land Use of Receiving Property	Maximum Permitted Exterior Sound Pressure Level, L_{EQ} (dBA) 7 a.m. to 10 p.m.	Maximum Permitted Exterior Sound Pressure Level, L_{EQ} (dBA) 10 p.m. to 7 a.m.
I	Single-Family Residential	60	45
II	Multi-Family Residential, Mobile Home Parks	65	45
III	Commercial Property and Institutional Property	70	60
IV	Residential Portion of Mixed Use	65	45
V	Manufacturing and Industrial, Other Uses	75	70

Source: City 2021
Notes:
1. The City's Noise Element includes a Noise Compatibility Matrix [included in this report as Table 1] with Community Noise Equivalent Level (CNEL) and is intended to apply to long-term ambient noise levels that are produced by sources such as traffic and evaluated over 24 hours. This table includes Noise Standards in terms of L_{EQ}. These levels are applicable to sounds that have shorter durations than 24-hours.
2. If the ambient noise level exceeds the maximum permitted sound level indicated in the table, the applicable maximum permitted sound pressure level shall be 3 dB above the ambient noise level.
3. Measurements for compliance are made on the affected property pursuant to the detail in Section C, Noise Measurements, 2. Exterior Noise Level Measurements.

B. Exemptions.

4. Construction and maintenance related noise when conducted in accordance with Section 8.08.020.

D. Vibration.

Notwithstanding other sections of this chapter, it shall be unlawful for any person to create, maintain, or cause any ground vibration which is perceptible without instruments at any point on any affected property adjoining the property on which the vibration source is located, if known, unless a temporary permit for the activity creating the vibration is issued by the City. For the purpose of this Section, the perception threshold shall be presumed to be more than 0.05 inch per second RMS vertical velocity.

E. Exterior Sound Level Limits.

1. It is unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise, on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level, when measured on any other receiving property, to exceed the following:

a. The noise standard in the above table [reproduced in this report as Table 2] for a cumulative period of more than thirty (30) minutes in any hour; or

b. The noise standard in the above table plus five (5) dBA for a cumulative period of more than fifteen (15) minutes in any hour; or

c. The noise standard in the above table plus ten (10) dBA for a cumulative period of more than five (5) minutes in any hour; or

d. The noise standard in the above table plus fifteen (15) dBA for a cumulative period of more than one (1) minute in any hour; or

e. The noise standard in the above table plus twenty (20) dBA for any period of time.

Each of the above maximum permitted sound levels specified above shall be reduced by five dBA for impulsive noises, tonal noises, and noises consisting of speech or music.

2.0 ENVIRONMENTAL SETTING

2.1 SURROUNDING LAND USES

Adjacent lands surrounding the project site include single-family residential neighborhoods to the north, a rural residence/ranch property within the cutout parcel on the project's eastern boundary, undeveloped open space to the south and west, SR 71 to the east, and open space/agricultural land to the east beyond SR 71. The project site and adjacent land to the north, west, and south are within the City limits. See Figure 2 for nearby land uses. Residences located in the surrounding lands are considered NSLUs.

2.2 EXISTING NOISE ENVIRONMENT

The existing noise environment is dominated by traffic noise from the SR 71 to the east of the project site. The project is subject to some aircraft noise and is located approximately 3 miles northwest of the Corona Municipal Airport, approximately 3.2 miles southwest of the Chino Airport, and approximately 9 miles southwest of the Ontario International Airport.

2.2.1 Ambient Noise Survey

Ambient noise measurements were taken at the project site in September 2021. The first measurement was recorded at the northeast corner of the project site approximately 50 feet south of the walled residences along Wrangler Road and Larita Drive. The noise measurements were short-term (10 to 15 minutes) and are not equivalent to the existing or future 24-hour ambient noise levels (CNEL). A second measurement was recorded at the terminus of Shady View Drive at the northern portion of the project site (see Figure 4, *Measurement Locations*). Traffic counts were not conducted. The measured noise levels are shown in Table 3, *Noise Measurement Results.* The site visit sheets are included as Appendix A to this report.

Table 3
NOISE MEASUREMENT RESULTS

Measurement M1	
Date:	September 17, 2021
Conditions:	Temperature: 72°F. Wind Speed: 2 mph. Low humidity. Sunny.
Time:	11:00 a.m. – 11:15 a.m.
Location:	At the northeast corner of the project site
Measured Noise Level:	61.3 dBA L_{EQ}
Notes During Measurement:	Noise primarily from traffic on the nearby SR 71. The view was obscured by a retaining wall.
Measurement M2	
Date:	September 17, 2021
Conditions:	Temperature: 72°F. Wind Speed: 2 mph. Low humidity. Sunny.
Time:	11:23 a.m. – 11:34 a.m.
Location:	Along the northern boundary of the project site at the terminus of Shady View Drive.
Measured Noise Level:	45.5 dBA L_{EQ}
Notes During Measurement:	Ambient nature sounds. Garbage truck passed by. Largely quiet.

Source: On-Site measurements, site visit sheets are included in Appendix A.

3.0 ANALYSIS, METHODOLOGY, AND ASSUMPTIONS

3.1 METHODOLOGY

3.1.1 Ambient Noise Survey

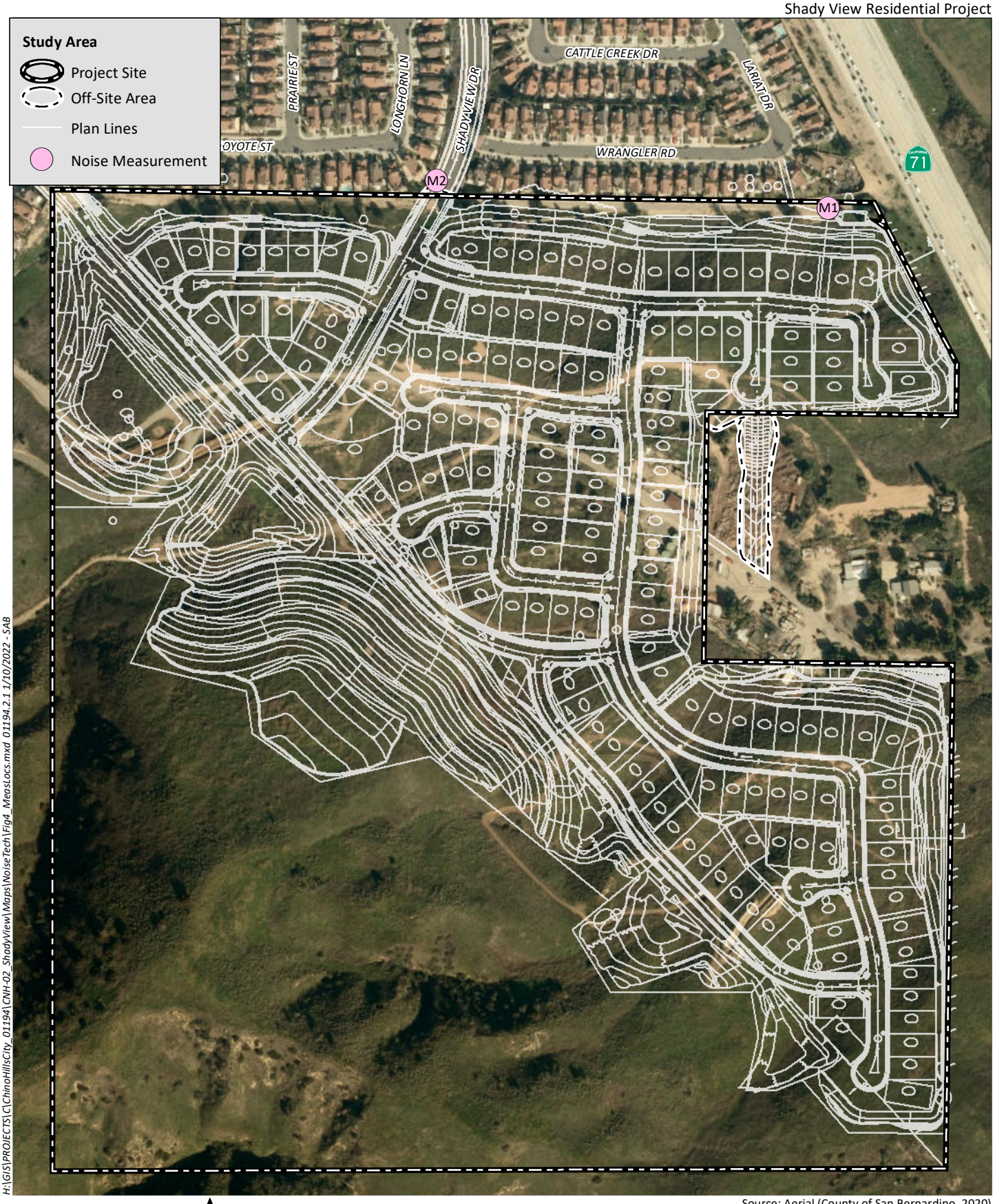
The following equipment was used to measure existing noise levels at the project site:

- Larson Davis 831 Noise Meter
- Larson Davis Model CA250 Calibrator
- Windscreen and tripod for the sound level meter

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2006). All instruments were maintained with National Institute of Standards and Technology traceable calibration per the manufacturers' standards.

3.1.2 Noise Modeling Software

Modeling of the exterior noise environment for this report was accomplished using two computer noise models: Computer Aided Noise Abatement (CadnaA) version 2021 and Traffic Noise Model (TNM) version 2.5. CadnaA is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most



H:\GIS\PROJECTS\C\ChinoHillsCity_01194\CNH-02_ShadyView\Maps\NoiseTech\Fig4_MeasLocs.mxd 01194.2.1 1/10/2022 - SAB

0 350 Feet

Source: Aerial (County of San Bernardino, 2020)

HELIX Environmental Planning

Measurement Locations

Figure 4

up-to-date calculation standards to predict outdoor noise impacts. CadnaA traffic noise prediction is based on the data and methodology used in the TNM.

TNM Version 2.5 was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (USDOT 2004). The model-calculated one-hour L_{EQ} noise output is approximately equal to the CNEL (Caltrans 2013).

Project construction noise was analyzed using the Roadway Construction Noise Model Version 1.1 which utilizes sound level measurements from standard construction equipment collected during a major construction project (RCNM; USDOT 2008).

3.2 ASSUMPTIONS

3.2.1 Construction

Project construction is anticipated to occur over approximately two years and two months starting in early 2022. Construction activities include demolition of existing facilities, site preparation, grading, installation of underground utilities and infrastructure, paving, construction of tanks and residences, and architectural coating (e.g., painting). Construction would require the use of equipment throughout the site for the full term of construction. Typical construction equipment for the proposed project would include concrete saws, dozers, tractors/loaders/backhoes, graders, scrapers, excavators, cranes, forklifts, cement and mortar mixers, pavers and paving equipment, rollers, and air compressors. The most prominent noise-generating standard construction equipment anticipated to be used on the site includes concrete saws, excavators, scrapers, dozers, pavers, and backhoes.

The proposed grading would not require export of soil, except for soil from areas around the oil tank operations. It is expected that this soil or some of it may be classified as non-hazardous petroleum impacted soil. The maximum estimated export would not exceed 19,000 cubic yards, requiring 1,188 haul truck loads (2,376 one-way trips) over the duration of grading (150 days). This assumes 15 feet of excavation and removal at all areas of potential contamination. Contaminated soil can be deposited at 14039 Santa Ana Avenue, Fontana.

In accordance with the City ordinance Section 8.08.020, construction activities would occur between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays. The total number of construction workers present at the site during construction activities would vary, depending on which phase on construction is occurring, but a maximum of 150 workers are anticipated during vertical building construction. All construction vehicles and equipment would be staged within the disturbed portions of the project site boundaries. The project site can be accessed from Shady View Drive and Via La Cresta. The majority of construction traffic would access the site via Shady View Drive.

3.2.2 Operations

The proposed project's operational noise sources would be typical of suburban residential neighborhoods. The primary noise sources are anticipated to include heating, ventilation, and air conditioning (HVAC) systems and vehicular traffic. During operation, the project would also be exposed to vehicular traffic noise from surrounding roadways, including SR 71.

3.2.2.1 Heating, Ventilation, and Air Conditioning Units

The analysis assumes that the buildings would use a typical to larger-sized residential condenser mounted on ground level pads. The unit used in this analysis is a Carrier 38HDR060 split system condenser. The manufacturer's noise data is shown below in Table 4, *Carrier HDR060 Condenser Noise*. The manufacturer's noise data sheet is included as Appendix B to this report.

Table 4
CARRIER HDR060 CONDENSER NOISE

Noise Levels in Decibels[1] (dB) Measured at Octave Frequencies							Overall Noise Level in A-weighted Scale (dBA)[1]
125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	
63.0	61.5	64.0	66.5	66.0	64.5	55.5	72.0

Source: Carrier, product data sheet included in Appendix B.
[1] Sound Power Level (S_{WL})
KHz = kilohertz

3.2.2.2 Vehicular Traffic Noise

Traffic volume data on project-affected street segments and the project's trip generation was provided in the Shady View Project Traffic Study (TS). The project is forecast to generate 1,501 weekday daily trips (one half arriving, one half departing), with 118 trips (30 inbound, 88 outbound) produced during the a.m. peak hour and 157 trips (99 inbound, 58 outbound) produced during the p.m. peak hour (Linscott Law & Greenspan [LLG] 2021). Approximately 80 percent of project trips would access the site on Shady View Drive and the remaining 20 percent would access the site on Via La Cresta (LLG 2021). The TS did not assess existing or future traffic levels for Via La Cresta. For modeling the segment of Via La Cresta from Mystic Canyon Drive to the project site, the single-family residential p.m. peak hour trip generation rate of 0.99 trips per DU (LLG 2021) was applied to the 136 existing residences which utilize Via La Cresta for access resulting in 135 existing p.m. peak hour trips. The mix of vehicles on the road segments was assumed to be typical of urban streets: 96 percent cars and light trucks, 3 percent medium truck and busses, and 1 percent heavy trucks.

Traffic noise on SR 71 was modeled using data from the Caltrans Traffic Census Program for the year 2020 which reported that the highway segment near the project site carries a p.m. peak hour volume of 6,900 (Caltrans 2020a). Caltrans truck data for 2019 shows SR 71 in Chino Hills contains 6.5 percent trucks, of which 4.3 percent is medium trucks and 2.2 percent is heavy trucks (Caltrans 2020b).

3.3 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, implementation of the project would result in a significant adverse impact if it would exceed the following thresholds:

Threshold 1: *Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City General Plan or Municipal Code.*

Impacts would be significant if the project would expose persons to or generate noise levels exceeding the following standards established in the City General Plan or Municipal Code:

- Temporary construction noise generated by the project would be significant if levels would result in a substantial increase in ambient noise (increase by 10 or more dBA) as perceived by nearby residents.

- Non-transportation noise generated by the project would be significant if operation of the project produces noise levels exceeding 60 dBA L_{EQ} or 80 dBA L_{MAX} measured in the outdoor spaces of the nearest off-site residences.

- A permanent increase in traffic noise resulting from the addition of project-generated traffic to roads in the City at the following levels would be significant if levels would exceed the residential exterior noise compatibility limit of 65 CNEL measured in the outdoor spaces of the NSLUs, or:

    i. An increase exceeding the FTA's cumulative limit to prevent moderate impacts on roadways where the baseline noise level is less than 65 CNEL.

    ii. A 3 dBA increase on roadways where the baseline noise level is 65 CNEL or over.

Threshold 2: *Generate excessive ground-borne vibration or ground-borne noise levels.*

Impacts would be significant if the project would result in the generation of ground-borne vibrations exceeding 0.05 inch per second RMS measured at off-site residential properties.

Threshold 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 use airport or private airstrip, expose people residing or working in the project area to excessive noise.*

Excessive noise exposure is defined as noise levels that exceed the standards in the City General Plan Noise Element for the associated land use, or conflict with noise compatibility policies in an applicable Airport Land Use Compatibility Plan (ALUCP).

4.0 IMPACTS

4.1 ISSUE 1: PERMANENT OR TEMPORARY INCREASE IN AMBIENT NOISE LEVELS

4.1.1 Construction Noise

Construction of the project would require demolition, site clearing, grading, installation of underground utilities/infrastructure, construction of tanks and new buildings, paving, and architectural coating. The magnitude of the noise impact would depend on the type of construction activity, equipment, duration of each construction phase, distance between the noise source and receiver, and any intervening structures. In accordance with the City's Municipal Code Section 8.08.020, construction would generate elevated noise levels for nearby residences north of the project site. All construction equipment would not operate at the same time, would be located throughout the project site, and therefore, would not remain at one distance to nearby residences during the 8-hour operating day. Table 5, *Construction Equipment Noise Levels*, provides the 100-foot distance noise levels for equipment anticipated to be used for general construction activities.

Table 5
CONSTRUCTION EQUIPMENT NOISE LEVELS

Unit	Percent Operating Time	dBA L_{EQ} at 100 feet	dBA L_{MAX} at 100 feet
Backhoe	40	67.6	71.5
Compactor	20	70.2	77.2
Compressor (air)	40	67.7	71.6
Concrete Mixer Truck	40	68.8	72.8
Concrete Pump Truck	20	68.4	75.4
Concrete Saw	20	76.6	83.6
Crane	16	66.6	74.5
Dozer	40	71.7	75.6
Dump Truck	50	66.5	70.4
Drum Mixer	40	71.0	74.0
Excavator	40	70.7	74.7
Front End Loader	40	69.1	73.1
Generator	50	71.6	71.6
Paver	50	68.2	68.2
Roller	20	67.0	67.0
Scraper	40	73.6	77.6

Source: RCNM, model output included in Appendix C
dBA = A-weighted decibel; L_{EQ} = equivalent sound level; L_{MAX} = maximum noise level

Not all the pieces of equipment included in Table 5 would be used within 100 feet of off-site residences. Demolition activities (including demolition of oil facilities) are not anticipated to occur within 500 feet of NSLUs. The project's most prominent noise-generating construction activities near off-site NSLUs would be grading. Grading would occur across the project site and is anticipated to involve the simultaneous use of a scraper and dozer, which could be used as close as 100 feet from the nearest off-site NSLU. At an average distance of 100 feet, a scraper and dozer would together generate noise levels of 75.7 dBA L_{EQ} and 77.6 dBA L_{MAX}.

Although construction noise is exempt from the City's noise ordinance exterior noise limit (Section 8.08.020 B), CEQA case law (King and Gardiner Farms, LLC v. County of Kern, Fifth District Court of Appeal, February 25, 2020) requires consideration of temporary or permanent increases in ambient noise levels in addition to evaluation against general plan and noise ordinance standards. No state or local standards have been established to determine the significance of a temporary increase in ambient noise levels resulting from land development project construction activities. For the purposes of this analysis, a substantial increase in perceived ambient noise levels (a 10 dBA increase) is used to estimate when temporary ambient noise increases would be potentially significant and would require feasible mitigation to minimize construction noise impacts to nearby NSLUs.

Assuming construction would remain steady and would generate 75.7 dBA L_{EQ} for the maximum allowed weekday hours of 7:00 a.m. to 7:00 p.m., the resulting noise level would be 72.7 CNEL. The short-term noise measurement taken near the end of Shady View Drive was 45.5 dBA L_{EQ}., indicating the ambient noise level is likely less than 50 CNEL for the existing residences west of Shady View Drive. Therefore, project construction would result in a temporary increase in ambient noise level in excess of 10 dBA and the impact would be potentially significant. Mitigation measure NOI-1 would require a construction

noise management plan with best management practices to minimize construction equipment noise and establish a system for noise complaints to be lodged and resolved.

As discussed in Section 3.2.1, it is anticipated that approximately 2,376 one-way truck trips, or approximately 16 truckloads per day of material would be exported over 150 days during grading, resulting in an average of 8 haul trips per day. Because a 3 dBA perceptible change in traffic noise would require a doubling of traffic volumes, the addition of 16 truck trips (approximately 2 trips per hour) to City streets during the construction hours would not result in a perceptible change in 24-hour ambient noise level (CNEL).

With implementation of mitigation measure NOI-1, the potential impact from construction equipment noise would be reduced to a less than significant level.

4.1.2 Operational On-site Noise Generation

The project would include HVAC units at ground-level locations adjacent to each proposed residence. Specific locations and planning data for the future HVAC units is not available at this stage of project design; however, HVAC units are assumed to be located on the sides of the proposed residences. Further, as mentioned above, modeling assumed that the HVAC unit would be a Carrier 38HDR060 split system condenser. A single unit typically generates a sound power level of 72 dBA S_{WL}, resulting in a noise level of 56 dBA S_{PL} at a distance of 7 feet, and would not exceed the City Municipal Code Section 16.48.020 exterior limit of 65 dBA L_{EQ} Off-site single-family residences would not be exposed to excess noise from the project's HVAC units, and the impact would be less than significant.

4.1.3 Operational Off-Site Transportation Noise

The project would generate vehicular traffic that would utilize existing surrounding streets and would result in increases in ambient noise levels. As described in Section 3.2.2, existing and future traffic noise was calculated using the TNM and trip/traffic input from the TS. The results of the traffic noise modeling for the existing, existing plus project, cumulative (year 2040, including growth and anticipated projects), and cumulative plus project scenarios is presented in Table 6, *Off-Site Traffic Noise Levels*. The modeling does not account for noise level reductions resulting from intervening terrain or structures (e.g., buildings, sound walls).

Table 6
OFF-SITE TRAFFIC NOISE LEVELS

Road Segment	Distance to Nearest NSLU (feet)[1]	NSLU Type	Existing CNEL	Existing + Project CNEL	Change in CNEL	2040 CNEL	2040 + Project CNEL	Change in CNEL
Shady View Drive								
Project to Mystic Canyon Drive	50	SF	49.7	57.4	7.7	50.9	57.5	6.6
Mystic Canyon Drive to Butterfield Ranch Road	50	SF	60.4	62.1	1.7	62.0	63.0	1.0
Via La Cresta								
Project to Mystic Canyon Drive	35	SF	54.6	55.2	0.6	54.6	55.2	0.6

Road Segment	Distance to Nearest NSLU (feet)[1]	NSLU Type	Existing CNEL	Existing + Project CNEL	Change in CNEL	2040 CNEL	2040 + Project CNEL	Change in CNEL
Butterfield Ranch Road								
Shady View Drive to Brookwood Lane	60	MF	67.3	67.3	0.0	68.0	68.1	0.1
Brookwood Lane to Twin Knolls Drive	60	SF	67.2	67.3	0.1	68.0	68.0	0.0
Twin Knolls Drive to Mystic Canyon Road	60	P	66.6	66.8	0.2	67.5	67.6	0.1

Source: TNM version 2.5

MF = Multi-Family Residential; NSLU = Noise Sensitive Land Use; P = Park; SF = Single-Family Residential.

[1] Distance measured from roadway centerline.

As shown in Table 6, traffic noise levels on the analyzed segments of Shady View Drive and Via La Cresta would not exceed the 65 CNEL exterior compatibility level for the land uses along each segment, without or with the project. The increase in ambient noise level for the road segment from the project to Mystic Canyon Drive is anticipated to be 7.7 dBA. This portion of Shady View Drive currently does not carry through traffic and only provides access for a small number of existing residences, hence the low calculated existing traffic noise level of 49.7 CNEL, and the low measured ambient noise level of 45 dBA L_{EQ}. However, the street appears to have been designed to carry a future higher volume of traffic: the roadway is approximately 55 feet wide; has a 35-mph speed limit; no residences have direct driveway access to Shady View Drive; and residences are separated from the street by an approximately 6-foot-high masonry sound wall. There is no City or State standard adopted for acceptable increases in ambient noise level for transportation sources. The FTA has developed criteria for acceptable increases in ambient noise resulting from implementation of transit projects, which would be applicable for transportation noise. For an existing noise exposure of 45 dBA L_{DN}, a cumulative increase of 7 dBA would be considered to have no impact (FTA 2018). Typical noise reduction from sound walls ranges from 3 to 15 dBA, depending on height, proximity to the noise source, and proximity to the receiver (FTA 2018). Considering reductions of at least 3 dBA from the existing sound walls along Shady View Drive (not accounted for in the modeling), the increase in ambient noise level in the outdoor spaces of the residences along Shady View Drive would not exceed the FTA's allowable increase of 7 dBA.

Existing and future noise levels along the analyzed segments of Butterfield Ranch Road exceed the 65 CNEL exterior noise compatibility level without the project. However, with the addition of project traffic the maximum increase in noise levels along Butterfield Ranch Road would be 0.2 dBA, below the 3.0 dBA level of a perceptible change in noise in typical urban outdoor environments.

Therefore, the addition of project generated traffic to existing traffic would not result in a substantial permanent increase in existing ambient noise levels, and the impact would be less than significant.

4.1.4 Impact Conclusion

With implementation of mitigation measure NOI-1 to minimize temporary construction noise and establish a system for lodging and resolution of construction noise complaints, the project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City General Plan or Municipal Code for the project.

NOI-1 Construction Noise Management Plan. A Construction Noise Management Plan that describes the measures included on the construction plans to minimize temporary noise at nearby residences shall be prepared by the project applicant and submitted to the City for approval prior to issuance of the grading permit. At a minimum, the following measures shall be included to minimize construction noise:

- Construction equipment shall be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.
- Diesel equipment shall be operated with closed engine doors and equipped with factory-recommended mufflers.
- Mobile or fixed "package" equipment (e.g., generators and air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion powered equipment.
- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) shall be prohibited.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise sensitive receptors.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.
- The project applicant shall notify residences within 500 feet of the project's property line in writing within one week of any construction activity requiring the use of heavy construction equipment. The notification shall describe the activities anticipated, provide dates and hours, and provide contact information with a description of a complaint and response procedure.
- The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for the affected resident shall be established prior to construction commencement to allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

4.1.5 Significance After Mitigation

With implementation of mitigation measure NOI-1 to reduce minimize temporary construction noise and establish a system for lodging and resolution of construction noise complaints, the project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the City General Plan or Municipal Code for the project. The impact would be less than significant with mitigation incorporated.

4.2 ISSUE 2: EXCESSIVE GROUND-BORNE VIBRATION

4.2.1 Construction Vibration

Construction of the project is not anticipated to require blasting or pile drivers (both substantial potential sources of ground-borne vibrations). A potential source of vibration during project construction activities would be a vibratory roller, which may be used for compaction of soil, aggregate, and/or asphalt in roadways and could be used within 50 feet of off-site residences. A large vibratory roller creates approximately 94 VdB measured at 25 feet, which is equivalent to 0.05 inches per second RMS (FTA 2018). A 0.05 inch per second RMS vibration level would equal 0.023 inch per second RMS at a distance of 50 feet.[1] This would be lower than the City Municipal Code Section 16.48.030 limit of 0.05 inch per second RMS. Additionally, off-site exposure to such ground-borne vibration would be temporary and limited to daytime hours and the short-term construction period. Therefore, construction of the project would not result in substantial ground-borne vibrations, and the impact would be less than significant.

4.2.2 Operational Vibration

Land uses that may generate substantial operational vibration include heavy industrial or mining operations that would require the use of vibratory equipment. The proposed residential land use does not include equipment that would generate substantial vibration. Therefore, long term operation of the project would not result in substantial ground-borne vibrations, and the impact would be less than significant.

4.2.3 Impact Conclusion

The project would not generate excessive ground-borne vibration or ground-borne noise levels. The impact would be less than significant, and no mitigation would be required.

4.3 ISSUE 3: AIRPORT NOISE EXPOSURE

The project is subject to some aircraft noise and is located approximately 3 miles northwest of the Corona Municipal airport, approximately 3.2 miles southwest of the Chino Airport, and approximately 9 miles southwest of the Ontario International Airport. The project site is not located within the airport influence area or 65 CNEL noise contour for any of those airports (Riverside County Airport Land Use Commission 2004; San Bernardino County 1991; City of Ontario 2011). The project would not expose people residing or working in the project area to excessive noise. The impact would be less than significant, and no mitigation would be required.

4.4 ISSUE 4: NOISE LEVEL STANDARD COMPLIANCE FOR NEW USES

As a single-family residential development, the project would be considered a new NSLU. In accordance with the 2015 California Supreme Court decision, *California Building Industry Association v. Bay Area Air Quality Management District*, the effect of existing noise on future residents of the project is not

[1] Equipment RMS = Reference RMS * $(25/D)^n$ (inches per second), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receiver in feet, and n = 1.1 (the value related to the attenuation rate through the ground); formula from FTA 2018.

considered an effect of the environment on the project and as such, is not generally a CEQA consideration unless the project would exacerbate an existing condition. The project's contribution of 47 vehicles to the existing 6,900 vehicles on SR 71 during the peak hour would not result in a detectable increase in noise (LLG 2021; Caltrans 2020a). Therefore, impacts to off-site project residences from traffic noise on SR 71 would not be a CEQA consideration. However, the noise effects on future project residents would be a planning consideration for the City in evaluating project design and in considering project approvals and/or permitting when viewed in the context of the General Plan Noise Element consistency.

The project would conflict with the City General Plan Noise Element if the proposed single-family residences are exposed to exterior noise levels in excess 65 CNEL, or interior noise levels in excess of 45 CNEL. Traffic from SR 71 would be the largest contributor of noise at the project site. Traffic noise levels for exterior use areas were modeled in CadnaA, as described in Sections 3.1 and 3.2. Receivers were placed at a height of 5 feet above ground level along the project's residential lot lines closest to SR 71. The resulting highest noise level for lots along facing SR 71 is shown in Table 7, *State Route 71 Traffic Noise Levels*. The noise modeling output tables are included as Appendix C to this report. As shown in Table 7, noise levels from traffic on SR 71 would exceed the City General Plan exterior residential standard of 65 CNEL for lots 32 through 36, and lots 115 through 129 (lots along the east side of the project site nearest to SR 71). In addition, lot 41 and lots 108 through 114 would exceed 60 CNEL. Because standard construction materials typically reduce interior noise levels by approximately 15 to 20 dBA, all of the lots with exterior noise in excess of 65 CNEL would potentially have interior noise levels in excess of the City General Plan residential limit of 45 CNEL. Compliance measure NOI-2 would require an acoustic barrier with a minimum height of 6 feet be constructed along the property lines facing SR 71 for lots 32 through 36, lot 41, and lots 108 through 129. The approximate location of acoustic barriers is shown in Figure 5, *Acoustic Barrier Locations*. As shown in Table 7, with acoustic barriers, the exterior noise level for all lots would not exceed 65 CNEL.

Table 7
STATE ROUTE 71 TRAFFIC NOISE LEVELS

Project Lot	2019 Traffic Noise Levels (CNEL)	Traffic Noise Levels with 6-foot Sound Walls (CNEL)
30	49.9	52.1
31	51.3	53.5
32	63.2	57.1
33	73.4	61.4
34	73.7	61.7
35	73.4	62.3
36	63.8	58.5
41	60.8	55.0
100	59.9	59.9
104	59.0	59.5
106	59.0	59.6
107	59.1	57.1
108	60.4	54.0
109	60.8	54.1
110	61.4	54.2
111	61.9	54.7

Project Lot	2019 Traffic Noise Levels (CNEL)	Traffic Noise Levels with 6-foot Sound Walls (CNEL)
112	62.3	55.5
113	63.0	55.7
114	64.9	56.6
115	67.9	59.2
116	66.6	57.3
117	66.7	57.1
118	66.9	57.1
119	67.0	57.6
120	66.7	58.0
121	66.9	58.8
122	66.9	59.4
123	66.7	59.6
124	66.7	59.7
125	66.5	59.3
126	66.4	58.1
127	66.4	58.2
128	66.3	57.6
129	66.1	56.7

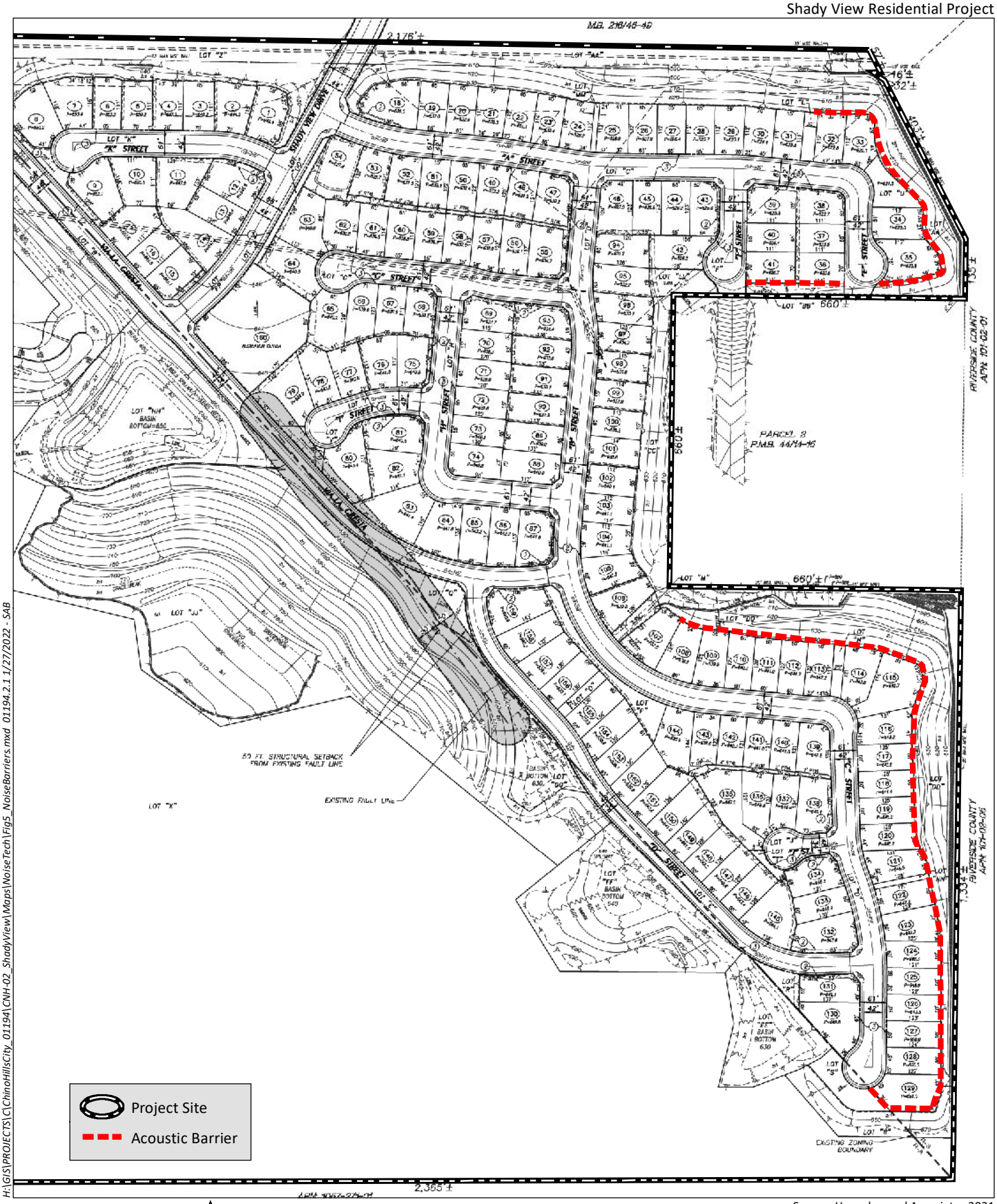
Source: CadnaA

Although compliance measure NOI-2 would reduce ground floor level interior noise to below 45 CNEL, some of the project residences could have habitable space on a second story. To ensure habitable interior spaces do not exceed the City standard, for lots 32 through 36, lot 41, and lots 108 through 129, compliance measure NOI-3 would require exterior walls and windows with direct line of sight to SR 71 be constructed with minimum STC ratings. With implementation of compliance measures NOI-2 and NOI-3, exterior and interior noise levels for project residences would not exceed the City standards or conflict with the General Plan Noise Element.

NOI-2 **Acoustic Barriers.** Acoustic barriers shall be constructed along the exterior lot lines with direct line of sight to SR 71 for lots 32 through 36, lot 41, and lots 108 through 129, as numbered on the proposed project tentative map 20317. Walls shall extend a minimum of 6 feet above the lot's finished grade level and shall be constructed of solid material having a minimum STC rating of 46. The walls shall be constructed with no holes or gaps, including between the wall and the ground.

NOI-3 **Building Wall and Window Acoustic Standards**. Residential building exterior walls with direct line of sight to SR 71 constructed on lots 32 through 36, lot 41, and lots 108 through 129, as numbered on the proposed project tentative map 20317, shall incorporate the following standards to reduce interior noise levels to 45 CNEL or less:

- Exterior walls shall have a minimum rating of STC 46. A common construction meeting this requirement would be standard 0.875-inch stucco over 0.5-inch shearwall on 2-inch by 6-inch studs with 0.625-inch Type "X" Drywall.



H:\GIS\PROJECTS\C\ChinoHillsCity_01194\CNH-02_ShadyView\Maps\NoiseTech\Fig5_NoiseBarriers.mxd 01194.2.1 1/27/2022 - SAB

0 300 Feet

Source: Hunsaker and Associates 2021

HELIX Environmental Planning

Acoustic Barrier Locations

Figure 5

- Exterior windows shall have a minimum rating of STC 28. A common window meeting this standard would be a dual glazing window with 0.125-inch glass thickness and a 0.5-inch gap between panes.

- The building design shall include a mechanical ventilation system that meets the criteria of the International Building Code (Chapter 12, §1203.2 of the California Building Code) to ensure that windows would be able to remain permanently closed for noise reduction.

4.4.1 Compliance After Incorporation of Measures

With incorporation of measures NOI-2 and NOI-3 into the project, future project residents would not be exposed to exterior or interior traffic noise in excess of standards established in the City's General Plan Noise Element.

5.0 LIST OF PREPARERS

Brendan Sullivan	Noise Analyst
Martin Rolph	Noise Analyst
Jason Runyan	Noise Analyst
Charles Terry	Principal Acoustician
Joanne Dramko, AICP	Principal Noise Specialist, QA/QC
Dave Crook, AICP	Project Manager
Ana Topete	Word Processor

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

6.0 REFERENCES

California Department of Transportation (Caltrans). 2020a. Traffic Census Program – 2019 Traffic Volumes. Available at: https://dot.ca.gov/programs/traffic-operations/census.

2020b. Traffic Census Program – 2019 Truck Traffic. Available at: https://dot.ca.gov/programs/traffic-operations/census.

2020c. Transportation and Construction Vibration Guidance Manual. April. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf.

2013. Technical Noise Supplement to the Traffic Noise Protocol. September. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf.

Chino Hills, City of (City). 2021. Municipal Code Amendment 21MCA02, adopted December 14, 2021. Available at: https://www.chinohills.org/DocumentCenter/View/24604.

2015 General Plan Noise Element. Available at: http://p1cdn4static.civiclive.com/UserFiles/Servers/Server_10382578/File/City%20Hall/Plans/General/04.10_Noise_PR_reduced.pdf.

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

Linscott Law & Greenspan (LLG). 2021. Traffic Study Shady View Project. October 22.

Ontario, City of. 2011. LA/Ontario International Airport Land Use Compatibility Plan. Available at: https://www.ontarioplan.org/alucp-for-ontario-international-airport/.

Riverside County Airport Land Use Commission. 2004. Riverside County Airport Land Use Compatibility Plan Policy Document – Corona Municipal Airport. Available at: https://www.rcaluc.org/Portals/13/PDFGeneral/plan/newplan/35-%20Vol.%202%20Corona%20Municipal.pdf.

San Bernardino, County of. 1991. Comprehensive Land Use Plan, Chino Airport. Available at: http://www.sbcounty.gov/Uploads/lus/Airports/Chino.pdf.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model Version 1.1. Available at: https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/.

2004. Traffic Noise Model Version 2.5. Available at: https://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_v25/.

Appendix A

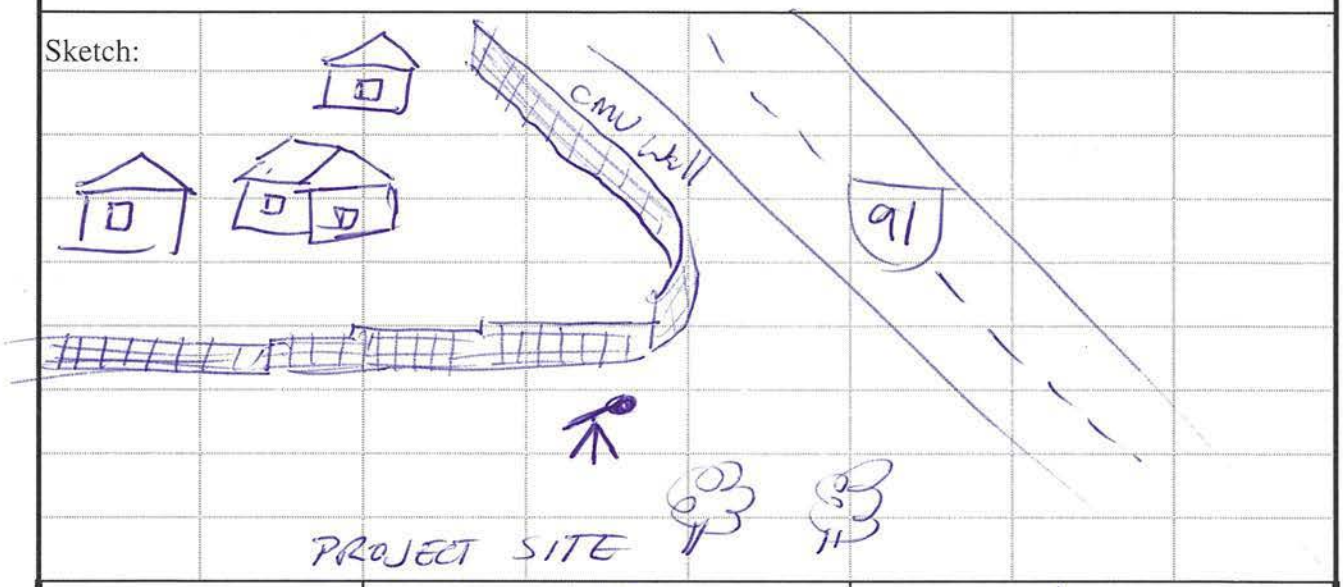
Site Survey Measurement Sheets

Site Survey

Job #		Project Name: Shady View	
Date: 9/17	Site #: 1	Engineer: *Jason Runyan*	
Address: 6714 Wrangler Road.			
Meter: LxT	Serial #: 1390	Calibrator: CA250	Serial #: 1741

Notes: Unable to get full view of freeway due to nearby wall

Sketch:



Temp: 72 °F	Wind Spd: 2 mph	Humidity: 1 %
Start of Measurement: 1100	End of Measurement: 1115	61.3 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

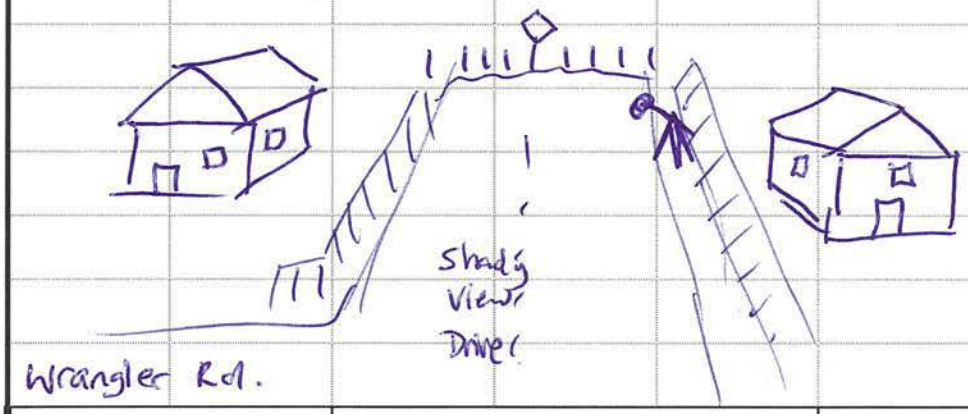
No Calibration Analysis Will Be Provided

Site Survey

Job #		Project Name: Shady View	
Date: 9/17	Site #: 2	Engineer: *Jason Runyan*	
Address: 6714 Wrangler Road			
Meter: LxT	Serial #: 1390	Calibrator: CA250	Serial #: 1741

Notes: Quiet, distant garbage truck.

Sketch:



Temp: 72	Wind Spd: 2 mph	Humidity: 1 %
Start of Measurement: 1123	End of Measurement: 1134	45.5 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

HVAC Noise Data Sheet

ELECTRICAL DATA

38HDR UNIT SIZE	V–PH–Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/ HACR BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018	208/230–1–60	187	253	9.0	48.0	0.80	0.125	0.09	12.1	20
024	208/230–1–60	187	253	12.8	58.3	0.80	0.125	0.09	16.8	25
030	208/230–1–60	187	253	14.1	73.0	1.45	0.25	0.19	19.1	30
036	208/230–1–60	187	253	14.1	77.0	1.45	0.25	0.19	19.1	30
	208/230–3–60	187	253	9.0	71.0	1.45	0.25	0.19	12.7	20
	460–3–60	414	506	5.6	38.0	0.80	0.25	0.19	7.8	15
048	208/230–1–60	187	253	21.8	117.0	1.45	0.25	0.19	28.7	50
	208/230–3–60	187	253	13.7	83.1	1.45	0.25	0.19	18.6	30
	460–3–60	414	506	6.2	41.0	0.80	0.25	0.19	8.6	15
060	208/230–1–60	187	253	26.4	134.0	1.45	0.25	0.19	34.5	60
	208/230–3–60	187	253	16.0	110.0	1.45	0.25	0.19	21.5	35
	460–3–60	414	506	7.8	52.0	0.80	0.25	0.19	10.6	15

* Permissible limits of the voltage range at which the unit will operate satisfactorily

FLA – Full Load Amps
HACR – Heating, Air Conditininng, Refrigeration
LRA – Locked Rotor Amps
NEC – National Electrical Code
RLA – Rated Load Amps (compressor)

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit.
All motors/compressors contain internal overload protection.

SOUND LEVEL

Unit Size	Standard Rating (dB)	Typical Octave Band Spectrum (dBA) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018	12 (6.7)
024	12 (6.7)
030	12 (6.7)
036	12 (6.7)
048	12 (6.7)
060	12 (6.7)

Appendix C

Noise Modeling Output

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/25/2022
Case Description: Shady View Residential

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Off-Site Residential	Residential	45	45	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	100	0
Compactor (ground)	No	20		83.2	100	0
Compressor (air)	No	40		77.7	100	0
Concrete Mixer Truck	No	40		78.8	100	0
Concrete Pump Truck	No	20		81.4	100	0
Concrete Saw	No	20		89.6	100	0
Crane	No	16		80.6	100	0
Dozer	No	40		81.7	100	0
Dump Truck	No	40		76.5	100	0
Drum Mixer	No	50		80	100	0
Excavator	No	40		80.7	100	0
Front End Loader	No	40		79.1	100	0
Generator	No	50		80.6	100	0
Paver	No	50		77.2	100	0
Roller	No	20		80	100	0
Scraper	No	40		83.6	100	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Backhoe	71.5	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	77.2	70.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	71.6	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	72.8	68.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Pump Truck	75.4	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
Concrete Saw	83.6	76.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	74.5	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	75.6	71.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dump Truck	70.4	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer	74	71	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	73.1	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	74.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	71.2	68.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	74	67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	77.6	73.6	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	83.6	82.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

CadnaA Version 2021
Road Source Table

Name	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
			Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
			(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(km/h)	(km/h)		(dB)		(%)	(dB)	(m)	(m)
SR-71		SR-71	77.5	0	0			6900	0	0	6.5	0	25	105	89	0	0	1	0	0		

CadnaA Version 2021
Receiver Table

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
Lot 30		L30	49.9	0	0	0		x	Total	1.52	r	439297.29	3753954.26	191.52
Lot 31		L31	51.3	0	0	0		x	Total	1.52	r	439316.64	3753951.81	191.52
Lot 32		L32	63.2	0	0	0		x	Total	1.52	r	439345.53	3753949.35	191.52
Lot 33		L33	73.4	0	0	0		x	Total	1.52	r	439363.51	3753947.45	191.52
Lot 34		L34	73.7	0	0	0		x	Total	1.52	r	439396.49	3753884.49	191.52
Lot 35		L35	73.4	0	0	0		x	Total	1.52	r	439407.66	3753853.43	191.52
Lot 36		L36	63.8	0	0	0		x	Total	1.52	r	439341.71	3753841.16	191.52
Lot 41		L41	60.8	0	0	0		x	Total	1.52	r	439309.55	3753844.71	191.52
Lot 100		L100	59.9	0	0	0		x	Total	1.52	r	439201.91	3753737.33	195.52
Lot 104		L104	59	0	0	0		x	Total	1.52	r	439194.28	3753664.84	195.52
Lot 106		L106	59	0	0	0		x	Total	1.52	r	439208.45	3753627.51	195.52
Lot 107		L107	59.1	0	0	0		x	Total	1.52	r	439225.89	3753601.35	198.52
Lot 108		L108	60.4	0	0	0		x	Total	1.52	r	439242.59	3753594.88	198.52
Lot 109		L109	60.8	0	0	0		x	Total	1.52	r	439260.44	3753592.42	198.52
Lot 110		L110	61.4	0	0	0		x	Total	1.52	r	439278.7	3753589.97	198.52
Lot 111		L111	61.9	0	0	0		x	Total	1.52	r	439297.36	3753588.34	198.52
Lot 112		L112	62.3	0	0	0		x	Total	1.52	r	439315	3753585.81	198.52
Lot 113		L113	63	0	0	0		x	Total	1.52	r	439333.53	3753583.9	198.52
Lot 114		L114	64.9	0	0	0		x	Total	1.52	r	439358.61	3753581.18	198.52
Lot 115		L115	67.9	0	0	0		x	Total	1.52	r	439392.4	3753563.47	198.52
Lot 116		L116	66.6	0	0	0		x	Total	1.52	r	439386.4	3753529.13	198.52
Lot 117		L117	66.7	0	0	0		x	Total	1.52	r	439387.22	3753508.69	198.52
Lot 118		L118	66.9	0	0	0		x	Total	1.52	r	439387.49	3753489.88	198.52
Lot 119		L119	67	0	0	0		x	Total	1.52	r	439387.77	3753473.53	198.52
Lot 120		L120	66.7	0	0	0		x	Total	1.52	r	439388.86	3753454.18	198.52
Lot 121		L121	66.9	0	0	0		x	Total	1.52	r	439394.31	3753434.56	198.52
Lot 122		L122	66.9	0	0	0		x	Total	1.52	r	439397.85	3753414.67	198.52
Lot 123		L123	66.7	0	0	0		x	Total	1.52	r	439401.39	3753394.5	198.52
Lot 124		L124	66.7	0	0	0		x	Total	1.52	r	439401.66	3753371.34	198.52
Lot 125		L125	66.5	0	0	0		x	Total	1.52	r	439402.21	3753353.35	198.52
Lot 126		L126	66.4	0	0	0		x	Total	1.52	r	439403.3	3753334.55	198.52
Lot 127		L127	66.4	0	0	0		x	Total	1.52	r	439403.3	3753316.29	198.52
Lot 128		L128	66.3	0	0	0		x	Total	1.52	r	439403.3	3753297.76	198.52
Lot 129		L129	66.1	0	0	0		x	Total	1.52	r	439399.76	3753274.59	198.52

CadnaA Version 2021
Receiver Table with Barriers

Name	M.	ID	Level Lr		Limit. Value		Land Use			Height		Coordinates		
			Day	Night	Day	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
Lot 30		L30	52.1	-79.5	0	0		x	Total	1.52	r	439297.29	3753954.26	191.52
Lot 31		L31	53.5	-79.2	0	0		x	Total	1.52	r	439316.64	3753951.81	191.52
Lot 32		L32	56.6	-78.4	0	0		x	Total	1.52	r	439345.53	3753949.35	191.52
Lot 33		L33	61.4	-78.4	0	0		x	Total	1.52	r	439363.51	3753947.45	191.52
Lot 34		L34	61.7	-78.3	0	0		x	Total	1.52	r	439396.49	3753884.49	191.52
Lot 35		L35	62.3	-77.9	0	0		x	Total	1.52	r	439407.66	3753853.43	191.52
Lot 36		L36	58.5	-78.5	0	0		x	Total	1.52	r	439341.71	3753841.16	191.52
Lot 41		L41	55	-78.9	0	0		x	Total	1.52	r	439309.55	3753844.71	191.52
Lot 100		L100	59.9	-78.9	0	0		x	Total	1.52	r	439201.91	3753737.33	195.52
Lot 104		L104	59.5	-79.1	0	0		x	Total	1.52	r	439194.28	3753664.84	195.52
Lot 106		L106	59.6	-79	0	0		x	Total	1.52	r	439208.45	3753627.51	195.52
Lot 107		L107	57.1	-79.2	0	0		x	Total	1.52	r	439225.34	3753600.39	198.52
Lot 108		L108	54	-79.4	0	0		x	Total	1.52	r	439242.31	3753593.38	198.52
Lot 109		L109	54.1	-79.3	0	0		x	Total	1.52	r	439259.35	3753590.52	198.52
Lot 110		L110	54.2	-79.2	0	0		x	Total	1.52	r	439278.42	3753587.79	198.52
Lot 111		L111	54.7	-79.1	0	0		x	Total	1.52	r	439297.09	3753585.88	198.52
Lot 112		L112	55.5	-79.1	0	0		x	Total	1.52	r	439314.87	3753583.9	198.52
Lot 113		L113	55.7	-79	0	0		x	Total	1.52	r	439333.4	3753581.32	198.52
Lot 114		L114	56.6	-78.8	0	0		x	Total	1.52	r	439358.47	3753578.45	198.52
Lot 115		L115	59.2	-78.6	0	0		x	Total	1.52	r	439390.63	3753563.19	198.52
Lot 116		L116	57.3	-78.8	0	0		x	Total	1.52	r	439383.68	3753529.81	198.52
Lot 117		L117	57.1	-79	0	0		x	Total	1.52	r	439384.09	3753508.55	198.52
Lot 118		L118	57.1	-79	0	0		x	Total	1.52	r	439384.63	3753490.02	198.52
Lot 119		L119	57.6	-78.7	0	0		x	Total	1.52	r	439385.28	3753473.21	198.52
Lot 120		L120	58	-78.7	0	0		x	Total	1.52	r	439386.45	3753453.67	198.52
Lot 121		L121	58.8	-78.7	0	0		x	Total	1.52	r	439393.1	3753433.53	198.52
Lot 122		L122	59.4	-78.6	0	0		x	Total	1.52	r	439396.99	3753414.5	198.52
Lot 123		L123	59.6	-78.7	0	0		x	Total	1.52	r	439400.19	3753394.5	198.52
Lot 124		L124	59.7	-78.6	0	0		x	Total	1.52	r	439401.66	3753371.34	198.52
Lot 125		L125	59.3	-78.7	0	0		x	Total	1.52	r	439401.69	3753353.18	198.52
Lot 126		L126	58.1	-79.1	0	0		x	Total	1.52	r	439401.07	3753334.55	198.52
Lot 127		L127	58.2	-78.8	0	0		x	Total	1.52	r	439400.72	3753316.46	198.52
Lot 128		L128	57.6	-78.9	0	0		x	Total	1.52	r	439400.72	3753298.45	198.52
Lot 129		L129	56.7	-79	0	0		x	Total	1.52	r	439397.87	3753275.28	198.52