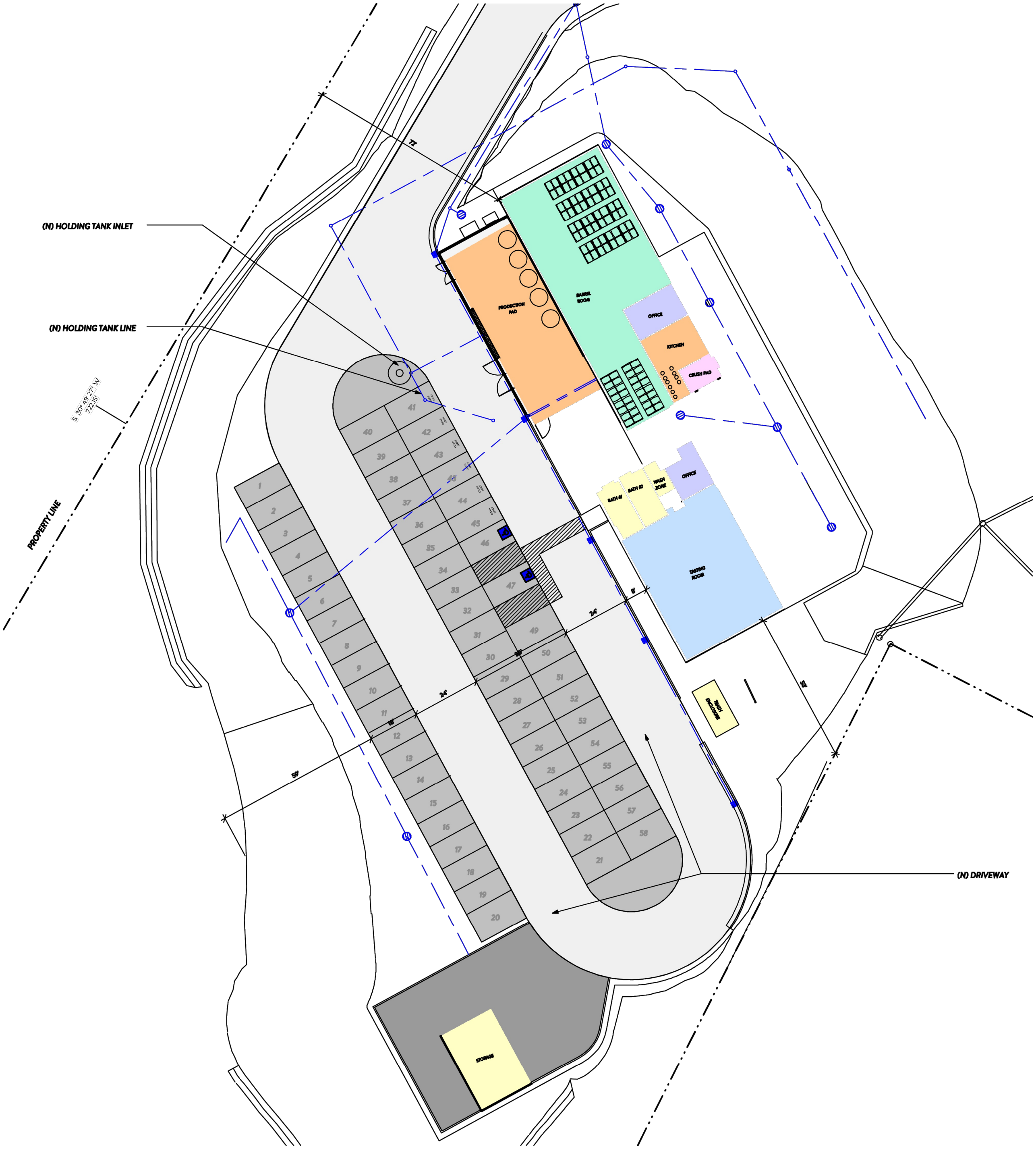
HAVEN WINERY
NOISE IMPACT STUDY
County of Riverside



RK engineering group, inc.

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NOISE IMPACT STUDY
County of Riverside, California

Prepared for:

Mr. Rick Neugebauer
RTN DEVELOPMENT
27555 Ynez Road, Suite 208
Temecula, CA 92591

Prepared by:

RK ENGINEERING GROUP, INC.
1401 Dove Street, Suite 540
Newport Beach, CA 92660

Bryan Estrada, TE
Becca Morrison

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

The purpose of this report is to evaluate the potential noise impacts from the proposed Haven Winery (project) and provide recommendations, if necessary, to minimize any potential project noise impacts.

The assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.) and the standards and methodology follow the County of Riverside Municipal Code and General Plan requirements.

The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Identification of the regulatory setting and applicable noise standards;
- Analysis of the existing noise environment;
- Analysis of the project's operational noise impact to adjacent receptors;
- Analysis of the project's construction noise and vibration impact to adjacent sensitive receptors; and
- Summary of recommended mitigation measures and project design features to reduce noise level impacts.

1.2 Site Location

The proposed project is located near the southwest corner of De Portola Road and Camino Del Vino, in the Temecula Valley Wine County Community Plan area of the unincorporated County of Riverside. The project site is approximately 9.26 gross acres and currently consists of an existing vineyard.

There are several noise sensitive receptors surrounding the project site, including;

- Existing residential homes located approximately 300 feet north of the northern property line of the project site.

- Existing residential homes located approximately 250 feet west of the western property line of the project site.

- Residential home under construction located approximately 80 feet northwest of the project's western property line.

- Existing The Vine House Bed & Breakfast located approximately 400 feet east of the proposed building area of the project site.

- Existing Oak Mountain Winery located approximately 250 feet south of the project site

The project site location map is provided in Exhibit A.

1.3 Project Description

The proposed project consists of constructing and operating a Class II Winery with a tasting room, restaurant, and a wine production and storage facility within the existing 9.26 acre site. The project will feature an outdoor patio area for wine tasting and dining, which may occasionally have an acoustic guitarist/singer. However, it is not expected to have any live events that include amplified sound from elevated speakers with large crowd noise.

The project site is currently vacant with the exception of the existing vineyard. The site plan used for this analysis is illustrated in Exhibit B.

This report analyzes the short-term noise impacts associated with construction activities and long-term noise impacts associated with the day-to-day operation of the project. The primary sources of operational noise include HVAC mechanical equipment noise, parking lot noise (including loading and unloading activities), and outdoor tasting/dining noise.

1.4 Summary of Analysis Results

Table 1 provides a summary of the noise analysis results, per the CEQA impact criteria checklist. With the implementation of the recommended project design features, the project is not expected to result in generation of 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.

Table 1
CEQA Noise Impact Criteria

Noise Impact Criteria	Potentially Significant	Potentially Significant Unless Mitigated	Less Than Significant Impact	No Impact
Would the project result in?				
a) Generation of 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?		X		
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) 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?				X

1.5 Recommended Project Design Features (DF)

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design.

Operational Design Features

DF-1 All HVAC equipment will be fully shielded from the line of sight of adjacent properties and the outdoor patio/dining areas on the site behind noise barrier walls/enclosures.

DF-2 Deliveries, loading and unloading activities, and trash pick-up hours should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-3 Engine idling time for all delivery vehicles and moving trucks will be limited to 5 minutes or less. Signage will be posted near the loading areas indicating the idling time restrictions.

Construction Design Features

DF-4 Construction-related noise activities shall comply with the requirements set forth in the County of Riverside Municipal Code Noise Ordinance 847.

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September;

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

DF-5 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

DF-6 Locate staging area, generators and stationary construction equipment as far from any adjacent sensitive receptors, as reasonably feasible.

DF-7 No impact pile driving or blasting activities are expected to occur on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment should be conducted and vibration monitoring program should be performed, prior to start of any pile driving activity.

1.5 Recommended Project Mitigation Measures (MM)

The following mitigation measure is recommended in order to ensure that project-generated noise levels will not exceed the thresholds established by the County of Riverside:

MM Noise-1: All onsite HVAC mechanical equipment shall have a maximum sound power rating of 85.0 dBA Leq.

2.0 Fundamentals of Noise

This section of the report provides basic information about noise and vibration and presents some of the terms used in the report.

2.1 Sound and Noise

The sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. The sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases, as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels and abbreviated as dB.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two (2) sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3dB increase.

If two (2) sounds differ by approximately 10 dB the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels[1]

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighing is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway), would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant, while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels. Following are the most commonly used noise descriptors along with brief definitions.

A-Weighted Sound Level

The sound pressure level in decibels as measured on a sound level meter using the A-weighted 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 response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level

The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

[1] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

Community Noise Equivalent Level (CNEL)

The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB)

A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A)

A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ)

The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room

Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n)

The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

Noise

Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Percent Noise Levels

See L(n).

Sound Level (Noise Level)

The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter

An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL)

The dBA level which, if it lasted for one (1) second, would produce the same A-weighted sound energy as the actual event.

2.7 Sound Propagation

As sound propagates from a source it spreads geometrically. The sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use the hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground

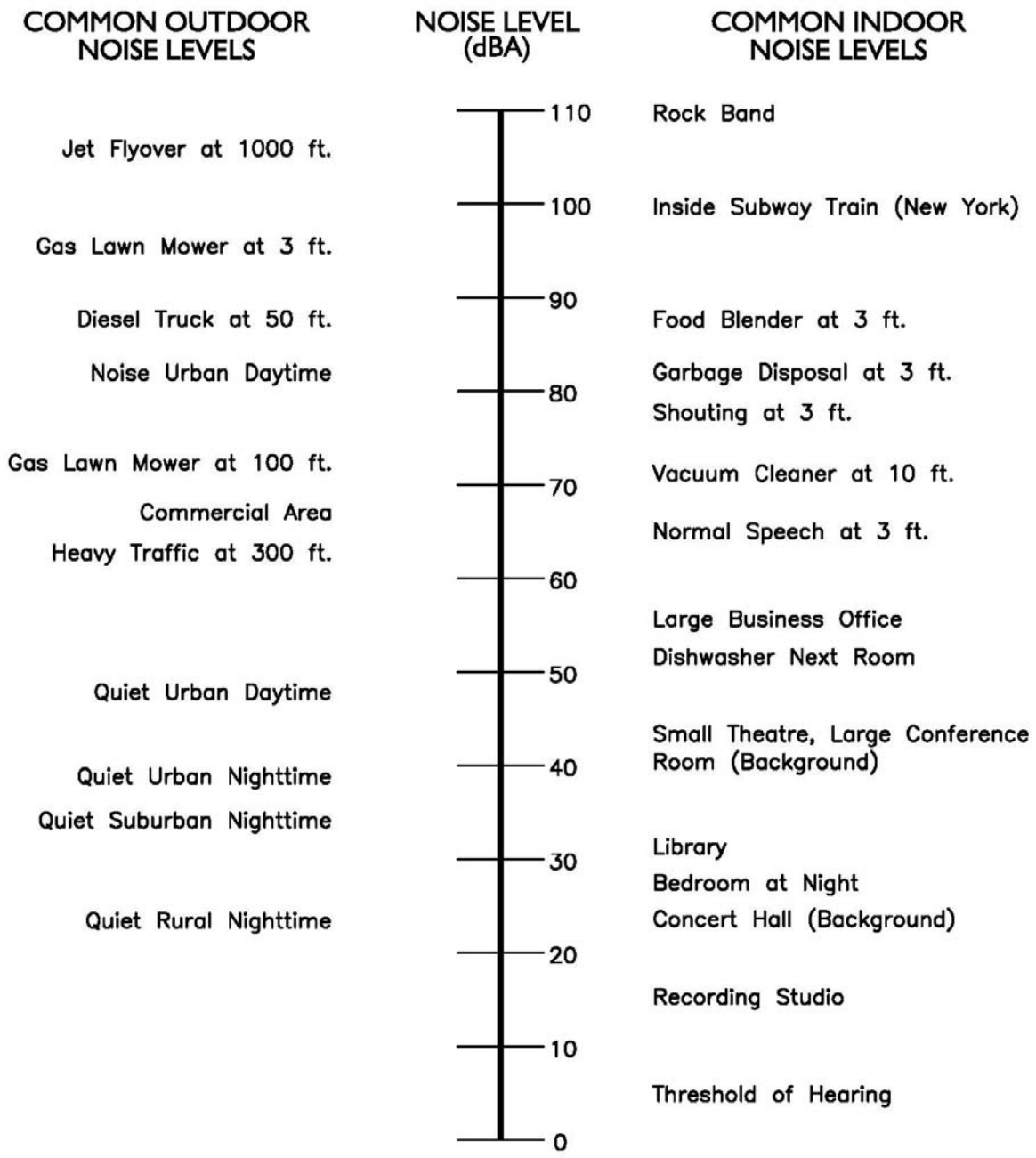
absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at an additional rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 6.0 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet and greater from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

Figure 1 shows typical sound levels from indoor and outdoor noise sources.

Figure 1[2]

TYPICAL SOUND LEVELS FROM
INDOOR AND OUTDOOR NOISE SOURCES



[2] Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

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2.8 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV

Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS

Known as the root mean squared (RMS) can be used to denote vibration amplitude.

VdB

A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

2.9 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts.

2.10 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

2.11 Construction Related Vibration Level Prediction[3]

Operational activities are separated into two different categories. The vibration can be transient or continuous in nature. Each category can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the project area site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. The thresholds from Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, in the table below provide general guidelines as to the maximum vibration limits for when vibration becomes potentially annoying.

[3] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020

Table 2
Vibration Annoyance Potential Criteria

Human Response	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts. The table below provides general vibration damage potential thresholds:

Table 3
Vibration Damage Potential Threshold Criteria

Structure and Condition	PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings ruin ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Soil conditions have an impact on how vibration propagates through the ground. The Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 provides suggested "n" values based on soil class. The table below outlines the manual's suggested values and description.

Table 4
Suggested "n" Values Based on Soil Classes

Soil Class	Description of Soil Material	Suggested Value of "n"
I	Weak or soft soils: loose soils, dry or partially saturated peat and muck, mud, loose beach sand, and dune sand.	1.4
II	Most sands, sandy clays, silty clays, gravel, silts, weathered rock.	1.3
III	Hard soils: densely compacted sand, dry consolidated clay, consolidated glacial till, some exposed rock.	1.1
IV	Hard, component rock: bedrock, freshly exposed hard rock.	1.0

3.0 Regulatory Setting

The proposed project is located in the County of Riverside and noise regulations are addressed through the various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

3.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three (3) purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The Federal government and the State advocate that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the Federal government and the State have preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

3.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix." The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 of the California Building Standards Code, which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State 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 published 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.

3.3 County of Riverside Noise Standards

3.3.1 Riverside County General Plan Noise Element

The County of Riverside describes the adopted polices for noise/land use compatibility in the 2015 General Plan Noise Element. Noise compatibility is reviewed to determine the project's compatible with the surrounding land uses. The County's Noise Element is provided in Appendix A. Table 5 shows the normally acceptable community noise exposure levels (CNEL) for land uses proposed on the project site.

Table 5
2015 General Plan Noise/Land Use Compatibility Guidelines[1]

Project Land Use Categories	Normally Acceptable Noise Level (CNEL)
Residential – Low Density Single Family, Duplex, Mobile Homes	60 dBA or less
Residential – Multiple Family	65 dBA or less
Transient Lodging – Motels, Hotels	65 dBA or less
Industrial, Manufacturing, Agriculture	75 dBA or less

[1] Source: 2015 County of Riverside General Plan, Chapter 7 Noise Element, Table N-1.

The 2015 General Plan also provides stationary noise source standards for land uses. Per General Plan Policy N 2.3, land uses should mitigate exterior and interior noises to the levels listed below to the extent feasible, for stationary sources. Table 6 shows the Stationary Source Land Use Noise Standards from the 2015 General Plan.

Table 6
2015 General Plan Stationary Source Noise Standards [1]

Land Use	Exterior Standards
Residential (10 p.m. to 7 a.m.)	45 Leq (10 minute)
Residential (7 a.m. to 10 p.m.)	65 Leq (10 minute)

[1] Source: 2015 County of Riverside General Plan, Chapter 7 Noise Element, Table N-2.

3.3.2 Riverside County Noise Ordinance No. 847

The Riverside County Board of Supervisors has adopted Ordinance No. 847 to establish countywide standards regulating noise. Per Ordinance No. 847, no person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table (2) below.

It should be noted that Ordinance No. 847 is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act.

Table 7 shows the sound level standards established in the Riverside County Ordinance No. 847, as they pertain to land uses surrounding the project site. The County's Noise Ordinance No. 847 is provided in Appendix A.

Table 7
Riverside County Ordinance No. 847 Sound Level Standards

Land Use	Maximum Decibel Level (Lmax)	
	7 am—10 pm	10 pm—7 am
Rural Community (Estate Density, Very Low Density and Low Density Residential)	55 dBA	45 dBA
Rural (Rural Residential, Rural Mountainous and Rural Desert Residential)	45 dBA	45 dBA
Agricultural	45 dBA	45 dBA
Community Development (Commercial Tourist, Retail Commercial)	65 dBA	55 dBA

Ordinance No. 847 also requires that no person shall install, use or operate sound amplifying equipment, or perform, or allow to be performed, live music unless such activities comply with the following requirements:

- Sound amplifying equipment or live music is prohibited between the hours of 10:00 p.m. and 8:00 a.m.

- Sound emanating from sound amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than two hundred (200) feet from the equipment or music.

3.3.3 Construction Noise Regulation

County of Riverside Ordinance No. 847 indicates that construction noise is exempt from the noise ordinance, provided any of the following are satisfied:

- Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling

- Private construction projects located within one-quarter (1/4) of a mile from an inhabited dwelling, provided that:

    - Construction does not occur between the hours of 6:00 PM and 6:00 AM during the months of June through September; and

    - Construction does not occur between the hours of 6:00 PM and 7:00 AM during the months of October through May.

3.3.4 Riverside County Department of Environmental Health Noise Standards

The Riverside County Department of Environmental Health has provided further guidelines for determining noise impacts for development review projects, as described in the Department of Environmental Health Requirements for Determining and Mitigating, Non-Transportation Noise Source Impacts to Residential Properties (Appendix A).

The Riverside County Department of Environmental Health noise standards are consistent with the policies described in the 2015 General Plan and are frequently cited by the County as the preferred thresholds of significance for CEQA analysis purposes.

The noise standards for stationary noise sources are shown in Table 8.

Table 8
Department of Environmental Health Stationary Source Noise Standards[1]

Noise Source	10-Minute Noise Equivalent Level (Leq)	
	7 am—10 pm	10 pm—7 am
Facility-Related Stationary Noise Sources	65 dBA	45 dBA

[1] Noise sources covered by this standard include, but are not limited to: industrial facilities, mining activities, loading dock activities, loud speakers operation, sporting events, musical performances, well pumps, equipment, vehicles operated off the public roadways, or any noise producing activities associated with a permanent fixed base of operation (hereafter referred to as the "facility"). Temporary construction activities are not covered by the standard. Noise levels must not exceed the 10-minute noise equivalent level standards as projected to any portion of any surrounding property containing a "habitable dwelling, hospital, school, library or nursing home

4.0 Study Method and Procedures

The following section describes the measurement procedures, measurement locations, and noise modeling procedures and assumptions used in the noise analysis.

4.1 Measurement Procedures and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

RK conducted the sound level measurements in accordance with Caltrans technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4: Specification for Sound Level Meter, 1983)

A Piccolo-II Type 2 integrating-averaging level meter was used to conduct long-term (24-hour) noise measurements at the project site and property boundaries.

The Leq, Lmin, Lmax, L2, L8, L25, and L50 statistical data were recorded over the measurement time period intervals and the information was utilized to define the noise characteristics for the project. The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed five (5) feet above the ground for long-term noise measurements
- Sound level meters were calibrated before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on “A” and slow response
- Temperature and sky conditions were observed and documented

Appendix B includes photos, field sheets, and measured noise data.

4.2 Stationary Noise Modeling

On-site stationary noise sources were analyzed using SoundPLAN™ noise modeling software. SoundPLAN™ is a standards-based program that incorporates more than twenty national and international noise modeling guidelines. This project consists of parking lot noise and stationary noise sources which are classified under industrial sources.

Projected noise levels from SoundPLAN™ are based on the following key parameters:

- Developing three-dimensional noise models of the project,
- Predicting the project noise levels at the selected community locations and
- Comparing the predicted noise with the existing community ambient noise levels at the receptor locations.

The sides of the buildings, walls, etc. were modeled as reflective surfaces and also as diffractive bodies. The noise sources are shown as red stars (point sources) and red surfaces (area sources). Project buildings and adjacent structures are depicted as blue hatched polygons and grey hatched polygons, respectively.

Most of the ground surrounding the project site is vineyards and natural vegetation and has been run as a soft site (Ground Factor=1). The Effective Flow Resistivity for field grass is SoundPLAN default. The elevation profile for the project site is derived from Google Earth and all the receptors are placed at 5 foot above the ground level.

Sound Power and Sound Pressure Level

Sound power level is the acoustic energy emitted by a source which produces a sound pressure level at some distance. While the sound power level of a source is fixed, the sound pressure level depends upon the distance from the source and the acoustic characteristics of the area in which it is located.

SoundPLAN requires that the source noise level be input using sound power level and which must be back calculated based on a measured sound pressure level. The sound power level is calculated using SoundPLAN software by calibrating the source noise level to equal the sound pressure level at an equal distance from the source in which the referenced measurement was taken.

4.2.1 Restaurant with Music Noise

To estimate future noise levels from the outdoor tasting/restaurant patio area, referenced noise level are derived from the SoundPLAN for the outdoor dining and patio area of the proposed project. The referenced noise level "Restaurants, music as major acoustic source" has been used to determine the project's restaurant outdoor noise levels.

Table 9
Restaurant with Music Reference Noise Levels[1]

Noise Source	Noise Level (Leq)
Restaurant, music as major acoustic source	82.0

[1] Source: SoundPLAN library.

The project may occasionally have an acoustic guitarist/singer playing within the outdoor patio area; however, it is not expected to have any live events that include amplified sound from elevated speakers with large crowd noise in their day-to-day operations.

4.2.2 Parking Lot Noise

Parking lot noise would occur from vehicles entering and exiting the site, idling, exhaust, doors slamming, tires screeching, general loading activities, people talking, and the occasional horn honking. Parking lot noise would occur throughout the site and is assessed by using referenced noise levels in the SoundPLAN model. Parking lot noise is based on the type of vehicle and number of movements per hour. Referenced noise levels for parking lot activities are based on the SoundPLAN™ standard *Parkplatzlärmstudie 2007*. Key inputs for parking lot noise include size of area source, number of movements per hour, type of vehicles, and number of parking spaces within each lot.

4.2.3 HVAC Equipment Noise

To estimate noise level impacts from on-site HVAC equipment, reference noise levels obtained by RK are utilized. Referenced noise levels represent similar commercial and industrial scale HVAC equipment operating under similar conditions as would be found on the project site. Table 10 indicates the referenced noise levels the HVAC equipment.

Table 10
HVAC Referenced Noise Levels[1]

Source	Distance from Source (feet)	Noise Levels (dBA)	
		L_{eq}	L_{max}
HVAC – Industrial[1]	6.0	88.5	88.5

[1] Referenced noise levels measured by RK over a 1-minute period.

To estimate the future noise levels during typical operational conditions, referenced noise levels are input into SoundPLAN and projected to the nearest sensitive receptor locations. Adjusted noise levels are based on the distance of the receptor location relative to the noise source, local topography and physical barriers including buildings and sound walls. The noise levels assume that the stationary sources operate continuously during both daytime and nighttime hours, when in reality will likely operate only intermittently throughout daily operations.

4.3 Construction Noise Modeling

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model, together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, and baseline parameters for the project site. This study evaluates the potential exterior noise impacts during each phase of construction. Noise levels were projected at an average distance of 50 feet for equipment operating over an 8-hour period from to the nearest sensitive receptor property line. While some construction noise activity may occur closer than 50 feet from the property line, noise levels are averaged over an 8-hour period for purposes of assessing impacts.

- Construction phasing and equipment usage assumptions are referenced from the Haven Winery AQ & GHG Impact Study, County of Riverside, by RK Engineering Group.

4.4 Construction Vibration Modeling

The construction vibration assessment is based on the methodology set-forth within the Caltrans Transportation and Construction Induced Vibration Guidance Manual. The vibration impacts from vibratory rollers and compactors, heavy truck loading and bulldozer activity is analyzed. All vibratory activity is analyzed as a continuous and/or frequent event and is required to comply with the applicable guidance thresholds criteria. It is expected

that vibration levels will be highest during paving phase. No impact pile driving is expected as part of this project.

Vibratory impacts were calculated from the site area property line to the closest sensitive receptors and structures using the reference vibration levels, soil conditions and the reference equation *PPV= PPV ref (25/D)^n (in/sec)* (from Caltrans Manual) where:

PPV = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground (n=1.1 was utilized for this study)

4.5 CEQA Guidelines Thresholds of Significance

This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.), which provides thresholds for determining when project noise impacts are significant. The following thresholds are used in this study to determine whether the project's noise-related impacts are considered significant under CEQA:

Would the project result in:

a. Generation of 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 or other agencies?

b. Generation of excessive groundborne vibration or groundborne noise levels?

c. 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 closest airport to the proposed project is the French Valley Airport, approximately 5 miles northwest of the project site. The project does not fall within the airport's influence area boundaries, nor is it located within a 2-mile radius[4]. Therefore, it can be concluded

[4] *Riverside County Airport Land Use Compatibility Plan, Volume 1 Policy Document,* Map FV-1. Riverside County Airport Land Use Commission, October 14, 2004.

without further analysis that the project will have no impact on Threshold C of the CEQA Guidelines.

5.0 Existing Noise Environment

The existing noise environment for the project site and surrounding areas has been established based on noise measurement data collected by RK. The project setting is rural/agricultural and the primary environmental noise impacting the project site is minimal roadway noise from adjacent streets.

5.1 Long-Term (24-Hour) Noise Measurement Results

To determine the existing noise level environment, RK conducted two (2) 24-hour noise measurements at the project study area.

Noise levels were measured on June 9, 2022 using a Piccolo-II Type 2 integrating-averaging sound level meter. The information was utilized to establish the noise characteristics of the existing ambient environment.

The noise monitoring locations were selected based on the proximity and location to adjacent sensitive receptors. Exhibit C graphically illustrates the location of the long-term measurements.

- Noise monitoring location one (L-1) was taken approximately 415 feet south of the centerline of Camino Del Vino and approximately 750 feet west of the centerline of De Portola Road

- Noise monitoring location two (L-2) was taken approximately 215 feet south of the centerline of Camino Del Vino and approximately 35 feet from the western property line.

Noise measurement results are summarized in Tables 11 and 12. Appendix B includes photographs, field sheets and measured noise data.

Noise measurements were conducted at the above selected locations to determine the existing ambient noise environment at the project site and nearby surrounding sensitive receptors.

Table 11
24-Hour Noise Measurement Results L-1[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	35.5	12:00 PM	43.2
1:00 AM	33.5	1:00 PM	43.7
2:00 AM	32.5	2:00 PM	39.7
3:00 AM	35.0	3:00 PM	42.3
4:00 AM	38.5	4:00 PM	41.3
5:00 AM	42.5	5:00 PM	39.0
6:00 AM	42.4	6:00 PM	38.3
7:00 AM	43.0	7:00 PM	38.2
8:00 AM	49.1	8:00 PM	40.3
9:00 AM	40.2	9:00 PM	38.8
10:00 AM	46.3	10:00 PM	35.5
11:00 AM	43.0	11:00 PM	35.0
		CNEL	**46.0**

[1] L-1 was taken approximately 415 feet south of the centerline of Camino Del Vino and approximately 750 feet west of the centerline of De Portola Road. L-1 was recorded on 06/09/2022.

Table 12
24-Hour Noise Measurement Results, L-2[1]

Time	Leq (dBA)	Time	Leq (dBA)
12:00 AM	37.4	12:00 PM	43.4
1:00 AM	34.4	1:00 PM	42.9
2:00 AM	34.2	2:00 PM	42.4
3:00 AM	36.3	3:00 PM	46.4
4:00 AM	40.5	4:00 PM	48.6
5:00 AM	50.8	5:00 PM	43.4
6:00 AM	46.6	6:00 PM	45.5
7:00 AM	47.4	7:00 PM	42.3
8:00 AM	53.5	8:00 PM	43.0
9:00 AM	45.4	9:00 PM	42.3
10:00 AM	48.0	10:00 PM	41.1
11:00 AM	42.1	11:00 PM	39.2
		CNEL	**50.9**

[1] L-2 was taken approximately 215 feet west of the centerline of Camino Del Vino and approximately 35 feet from the western property line. L-2 was recorded on 06/09/2022.

6.0 Operational Noise Impacts

This assessment analyzes the anticipated noise levels generated by the project and compares it to the standards established in the County's General Plan and Noise Ordinance.

The primary sources of operational noise include HVAC mechanical equipment, parking lot noise, and outdoor dining and wine tasting with live acoustical music.

This noise analysis does not consider noise impacts from outdoor special occasion events with amplified music and large crowds, as no such events are currently proposed for this project.

6.1 Operational Noise Impacts

On-site stationary noise impacts are assessed at the sensitive noise receptor locations surrounding the project site.

HVAC equipment will be generally located at ground level adjacent to the proposed wine production and tasting buildings. All HVAC equipment is expected to be shielded from the line of sight of the adjacent sensitive receptors by a noise barrier wall/enclosure.

On-site vehicular noise would occur from vehicle engine idling and exhaust, doors slamming, tires screeching, general loading activities, people talking, and the occasional horn honking. Parking lot activity is expected to occur along all project driveways, parking lots, and loading areas.

Outdoor dining and wine tasting will primarily take place on the outdoor patio area. Outdoor dining noise would include normal conversational noise and occasional noise from an acoustical guitarist/singer with no amplified speaker noise.

SoundPLAN calculation worksheets are shown in Appendix C and are graphically illustrated in Exhibit D.

Unmitigated Stationary Noise Source Impacts

This analysis assesses noise impacts resulting from the simultaneous operation of all onsite stationary noise sources during daytime hours (7 a.m. to 10 p.m.). Outdoor dining and music are expected to cease at 10 p.m. Therefore, potential noise impacts during nighttime

hours (10 p.m. to 7 a.m.) are assessed for all onsite stationary noise sources, excluding outdoor dining and music.

The results of the daytime and nighttime unmitigated noise impact analysis are shown in Tables 13 and 14, respectively, and are graphically illustrated in Exhibits D through F.

As shown in Tables 13 and 14, noise generated by the project is expected to exceed the County's daytime and nighttime noise standards.

Table 13
Typical Operational Noise Levels (dBA) – Daytime

SoundPLAN Receiver Location	Daytime Exterior Noise Level dBA			
	Project Noise Contribution (Leq)	Ordinance No. 847 Noise Level Criteria (Lmax)	County of Riverside General Plan Noise Level Criteria (Leq)	Noise Level Exceeds Standard (?)
1	40.5	45.0	65.0	No
2	38.9			No
3	43.1			No
4	47.3			**Yes**
5	37.8			No
6	39.3			No
7	41.4			No

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Table 14
Typical Operational Noise Levels (dBA) – Nighttime

SoundPLAN Receiver Location	Daytime Exterior Noise Level dBA			
	Project Noise Contribution (Leq)	Ordinance No. 847 Noise Level Criteria (Lmax)	County of Riverside General Plan Noise Level Criteria (Leq)	Noise Level Exceeds Standard (?)
1	39.6	45.0	45.0	No
2	38.1			No
3	42.6			No
4	46.9			**Yes**
5	36.9			No
6	38.5			No
7	40.7			No

Mitigated Stationary Noise Source Impacts

In order to reduce noise levels projected by the project, the following mitigation measure (MM) is recommended:

MM Noise-1: All onsite HVAC mechanical equipment shall have a maximum sound power rating of 85.0 dBA Leq.

Tables 15 and 16 show the projected noise impacts during daytime and nighttime hours, respectively, with the above mitigation applied. As shown in Tables 15 and 16, noise generated by the project is not expected to exceed the County's daytime and nighttime noise standards with the implementation of the recommended mitigation measure.

As a result, **the project's noise impact is expected to be less than significant with mitigation applied.**

Table 15
Mitigated Typical Operational Noise Levels (dBA) – Daytime

SoundPLAN Receiver Location	Daytime Exterior Noise Level dBA			
	Project Noise Contribution (Leq)	Ordinance No. 847 Noise Level Criteria (Lmax)	County of Riverside General Plan Noise Level Criteria (Leq)	Noise Level Exceeds Standard (?)
1	39.3	45.0	65.0	No
2	37.1			No
3	40.5			No
4	44.8			No
5	36.0			No
6	37.6			No
7	39.6			No

Table 16
Mitigated Typical Operational Noise Levels (dBA) – Nighttime

SoundPLAN Receiver Location	Daytime Exterior Noise Level dBA			
	Project Noise Contribution (Leq)	Ordinance No. 847 Noise Level Criteria (Lmax)	County of Riverside General Plan Noise Level Criteria (Leq)	Noise Level Exceeds Standard (?)
1	38.0	45.0	45.0	No
2	35.9			No
3	39.5			No
4	43.8			No
5	34.4			No
6	36.3			No
7	38.6			No

6.2 Future Roadway Noise Levels

The project is not expected to cause a substantial increase in ambient noise levels in the vicinity of the site as a result of increased traffic volume along adjacent roadways.

Typically, it takes a doubling of traffic volume along a roadway to cause a significant increase in ambient noise levels of more than 3 dBA. Based on the TIA, the project will not double the amount of traffic volumes on either Camino Del Vino or De Portola Road either directly or cumulatively and therefore no further analysis is recommended.

6.4 Operation Project Design Features (DF)

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into its design.

Operational Design Features

DF-1 All HVAC equipment will be fully shielded from the line of sight of adjacent properties and the outdoor patio/dining areas on the site behind noise barrier walls/enclosures.

DF-2 Deliveries, loading and unloading activities, and trash pick-up hours should be limited to daytime hours only (7 a.m. – 10 p.m.).

DF-3 Engine idling time for all delivery vehicles and moving trucks will be limited to 5 minutes or less. Signage will be posted near the loading areas indicating the idling time restrictions.

6.5 Compliance with CEQA Thresholds – Operations

Based on the above analysis, the proposed project, with the recommended mitigation applied, is not expected to 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. Therefore, the project would have a less than significant impact under Threshold A of the CEQA Guidelines, with the recommended mitigation applied.

The proposed project will consist of a wine tasting room and restaurant land uses with a small light industrial production and general office building component. This type of project does not include major sources of operational vibration that would result in significant exposure of sensitive receptors to substantial vibration levels. Therefore, the project will have a less than significant impact under Threshold B of the CEQA Guidelines.

7.0 Construction Noise and Vibration Impacts

Temporary construction noise and vibration impacts have been assessed from the project site to the surrounding adjacent land uses. The degree of construction noise will vary depending on the type of construction activity taking place and the location of the activity relative to the surrounding properties.

During the construction period, the contractors would be required to comply with County of Riverside Ordinance No. 847 which indicates that construction noise is exempt from the noise ordinance, provided any of the following are satisfied:

- Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling

- Private construction projects located one-quarter (1/4) of a mile from an inhabited dwelling, provided that:

    - Construction does not occur between the hours of 6:00 PM and 6:00 AM during the months of June through September; and

    - Construction does not occur between the hours of 6:00 PM and 7:00 AM during the months of October through May.

7.1 Typical Construction Noise Levels

Table 17 shows typical construction noise levels compiled by the Environmental Protection Agency (EPA) for common type construction equipment. Typical construction noise levels are used to estimate potential project construction noise levels at the adjacent sensitive receptors.

Table 17
Typical Construction Noise Levels[1]

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Pneumatic Wrenches	82 - 87
Jack Hammers, Rock Drills	80 - 99
Pile Drivers (Peak)	95-105
Other	
Vibrators	68 - 82
Saws	71 - 82

[1] Referenced Noise Levels from the Environmental Protection Agency (EPA)

7.2 Construction Noise Impact Analysis

This assessment analyzes potential noise impacts during all expected phases of construction, including site preparation, grading, building construction, paving, and architectural coating. Noise levels are calculated based on an average distance of equipment over an 8-hour period at 50 feet away. The project's estimated construction noise levels have been calculated using the Federal Highway Administration Roadway Construction Noise Model Version 1.1. Table 18 shows the noise level impacts at 50 feet. Construction noise calculation worksheets are provided in Appendix D.

Table 18
Project Construction Noise Levels – at 50 Feet

Phase	Equipment	Quantity	Equipment Noise Level at 50 feet (dBA Leq)	Combined Noise Level (dBA Leq)
Site Preparation	Graders	1	81.0	84.6
	Rubber Tired Dozers	1	77.7	
	Tractors/Loaders/Backhoes	1	80.0	
Grading	Graders	1	81.0	85.9
	Rubber Tired Dozers	1	77.7	
	Tractors/Loaders/Backhoes	2	80.0	
Building Construction	Cranes	1	72.6	83.4
	Forklifts	1	71.0	
	Generators	1	77.6	
	Tractors/Loaders/Backhoes	1	80.0	
	Welders	3	70.0	
Paving	Cement and Mortar Mixers	4	74.8	84.6
	Pavers	1	74.2	
	Paving Equipment	1	73.0	
	Rollers	1	73.0	
	Tractors/Loaders/Backhoes	1	80.0	
Architectural Coating	Air Compressors	1	73.7	73.7
Worst Case Construction Phase Noise Level - Leq (dBA)				85.9

As shown in Table 18, the project's construction is expected to generate noise levels which range from 73.7 dBA to 85.9 dBA at 50 feet. Construction noise calculation worksheets are provided in Appendix D.

The project's construction noise-related impacts will be less than significant.

7.3 Construction Vibration

To determine the vibratory impacts during construction, reference construction equipment vibration levels were utilized and then extrapolated to the façade of the nearest adjacent structures. The nearest sensitive receptors are the existing residential homes and the Oak Mountain Wintery located approximately 250 feet west and south of the proposed project.

However, an existing shed is located approximately 100 feet southeast of the project site. Therefore, the vibration analysis conservatively considers the closest structure to be located at a distance of 100 feet.

The construction of the proposed project is not expected to require the use of substantial vibration inducing equipment or activities, such as pile drivers or blasting. The main sources of vibration impacts during construction of the project would be the operation of equipment such as bulldozer activity during demolition and site preparation, loading trucks during grading and excavation and vibratory rollers during paving.

The construction vibration assessment utilizes the referenced vibration levels and methodology set-forth within the Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, September 2018.

Table 19 shows the FTA referenced vibration levels.

Table 19
Typical Construction Vibration Levels[1]

Equipment	Peak Particle Velocity (PPV) (inches/second) at 25 feet	Approximate Vibration Level (LV) at 25 feet
Piledriver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Piledriver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

[1] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

Table 20 shows the project's construction-related vibration analysis at the nearest structures to the project construction area.

Table 20
Construction Vibration Impact Analysis

Construction Activity	Distance to Nearest Structure (ft)	Duration	Calculated Vibration Level - PPV (in/sec)	Damage Potential
Large Bulldozer	100	Continuous/Frequent	0.019	Extremely fragile historic buildings, ruins, and ancient monuments
Vibratory Roller	100	Continuous/Frequent	0.046	Extremely fragile historic buildings, ruins, and ancient monuments
Loaded Trucks	100	Continuous/Frequent	0.076	Extremely fragile historic buildings, ruins, and ancient monuments

As shown in Table 20, the worst-case project-related construction activity is expected to cause vibration levels which fall under the extremely fragile historic buildings, ruins, and ancient monuments damage potential threshold. No known extremely fragile historic buildings, ruins, or ancient monuments are located within the project vicinity. Therefore, the impact is considered less than significant.

Construction vibration calculation worksheets are shown in Appendix D.

7.4 Construction Project Design Features

The following recommended project design features include standard rules and requirements, best practices and recognized design guidelines for reducing noise levels. Design features are assumed to be part of the conditions of the project and integrated into the site design and construction management plan.

DF-5 Construction-related noise activities shall comply with the requirements set forth in the County of Riverside Municipal Code Noise Ordinance 847.

1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September;

2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

DF-6 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices and equipment shall be

maintained so that vehicles and their loads are secured from rattling and banging. Idling equipment should be turned off when not in use.

DF-7 Locate staging area, generators and stationary construction equipment as far from any adjacent sensitive receptors, as reasonably feasible.

DF-8 No impact pile driving activities are expected to occur on the project site during construction. If impact pile driving is required, a follow-up noise and vibration impact assessment should be conducted and vibration monitoring program should be performed, prior to start of any pile driving activity.

Exhibits

Exhibit A

Location Map

Legend:

= Project Site Boundary

= Project Site

N

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Exhibit B
Site Plan

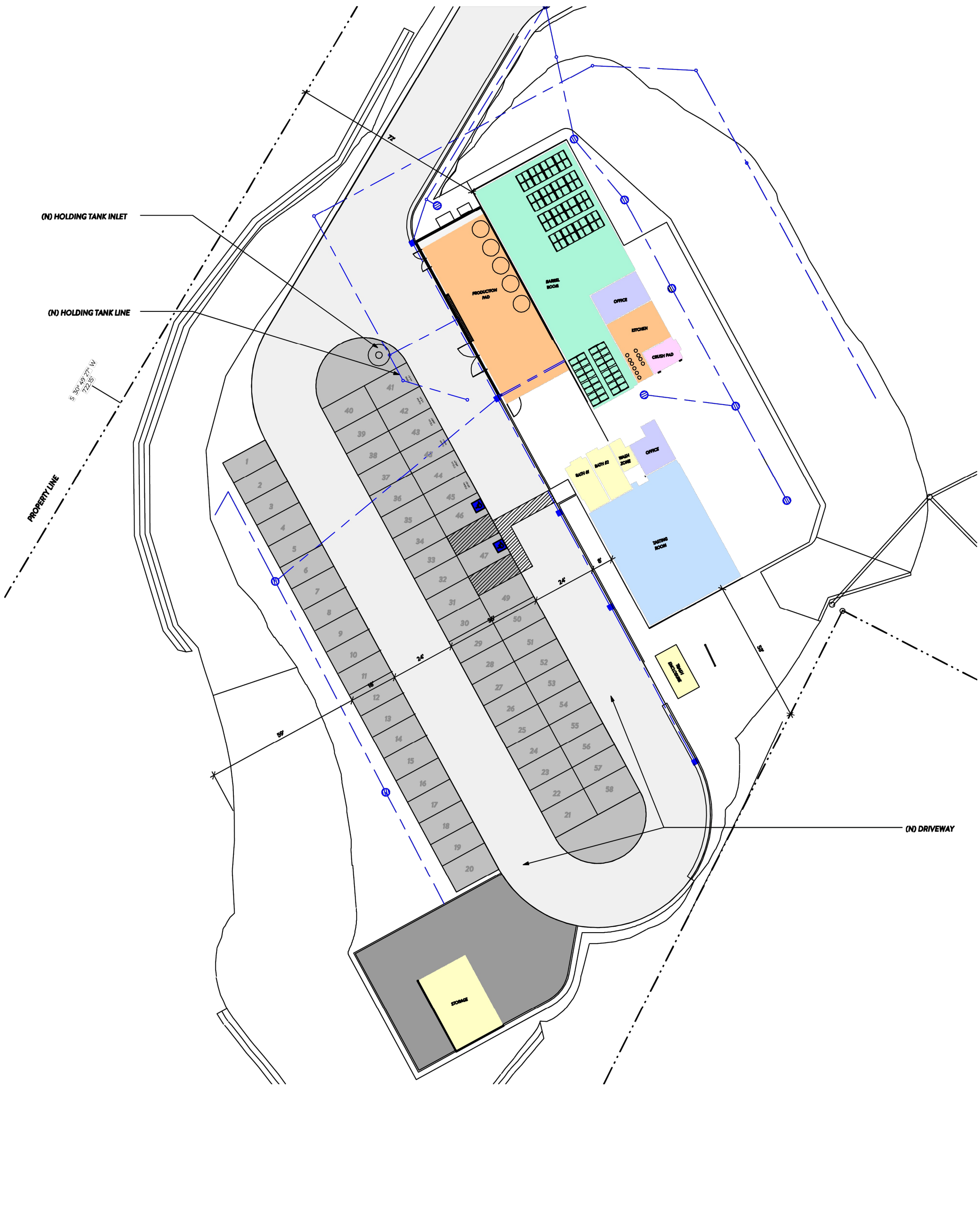

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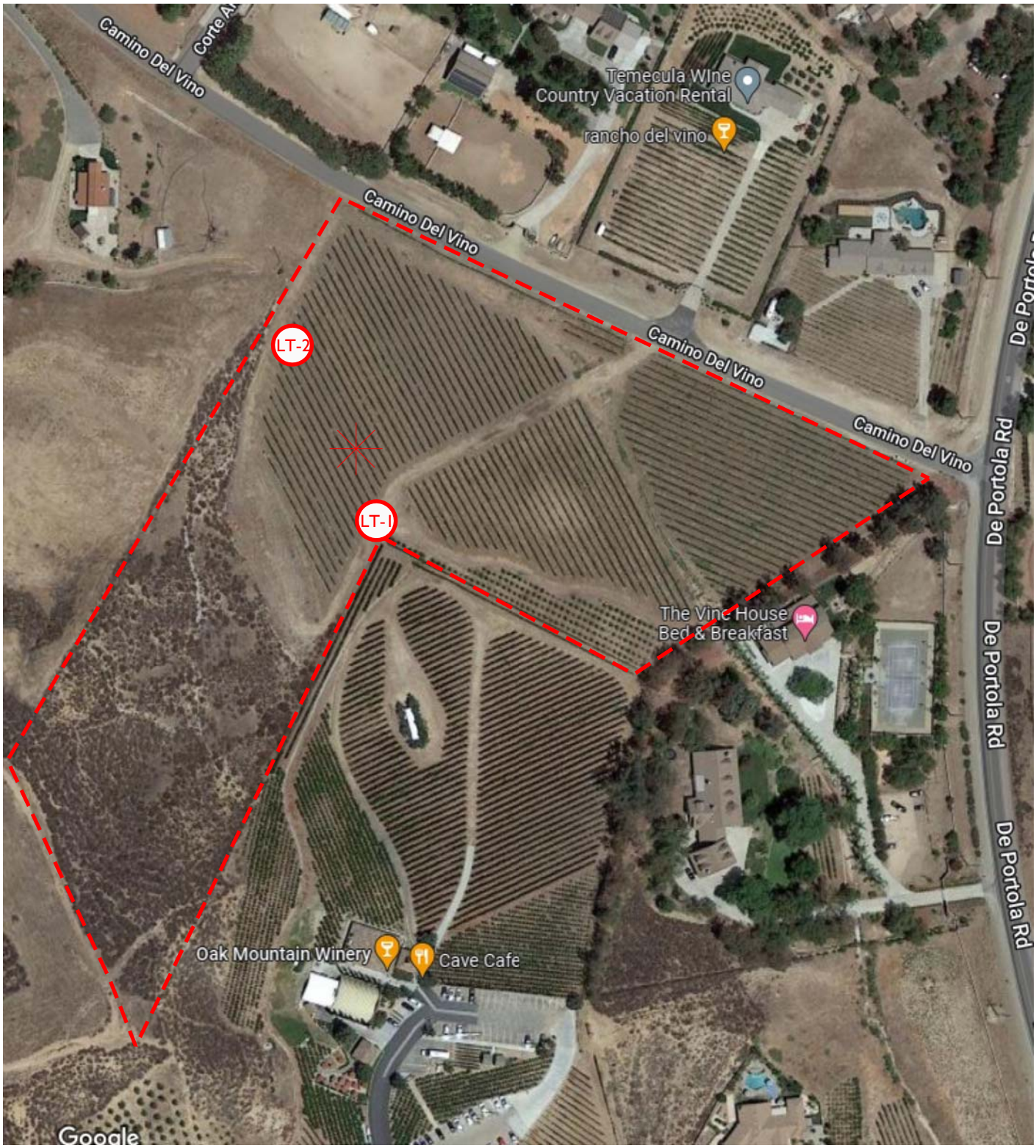
Exhibit C

Noise Monitoring Locations



Legend:

= Project Site Boundary

LT-1 = Long Term (24-Hr) Noise Monitoring Location

N

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Exhibit D

Typical Operational Day/Night Noise Levels (dBA)

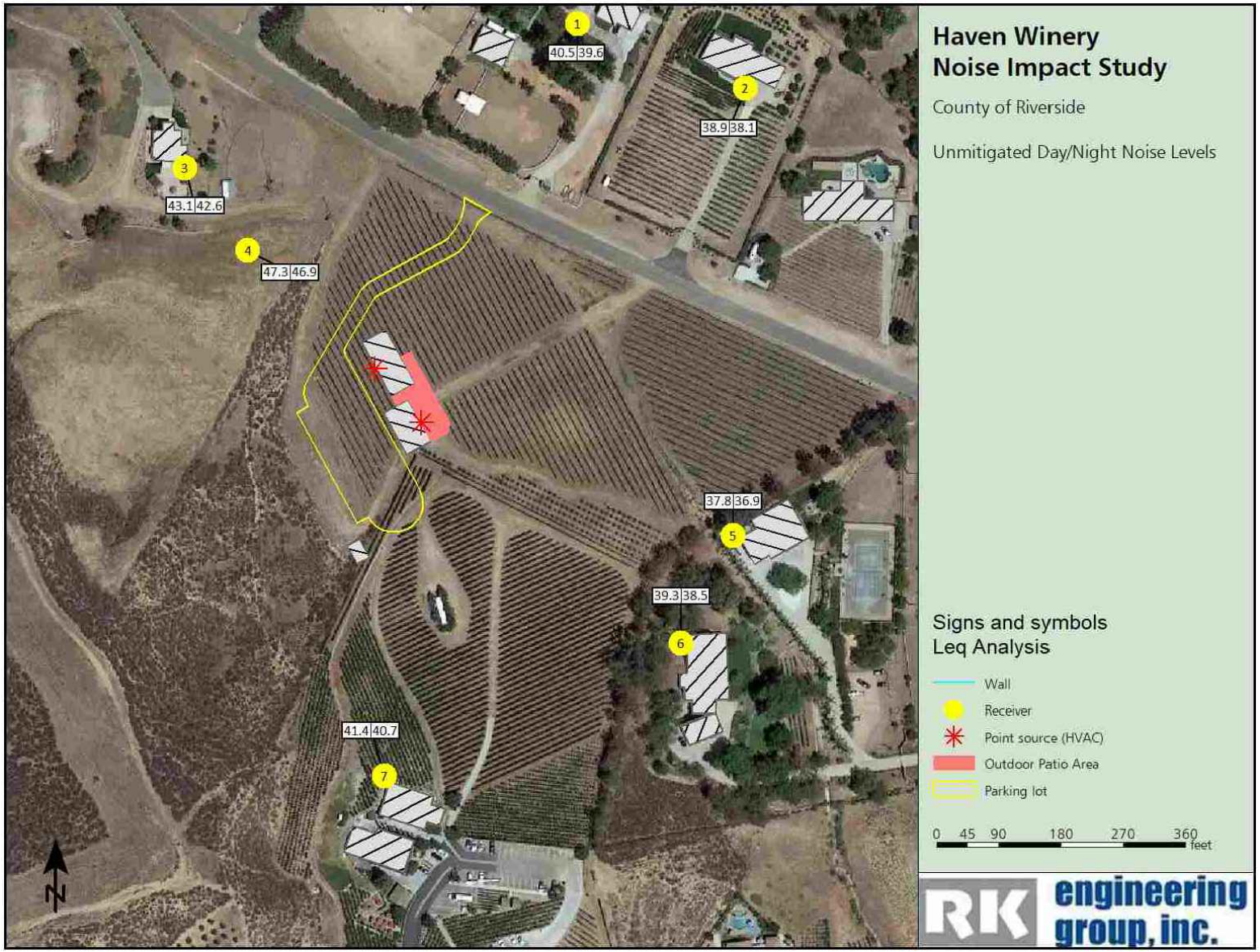


Exhibit E

Typical Operational Noise Contours - Daytime

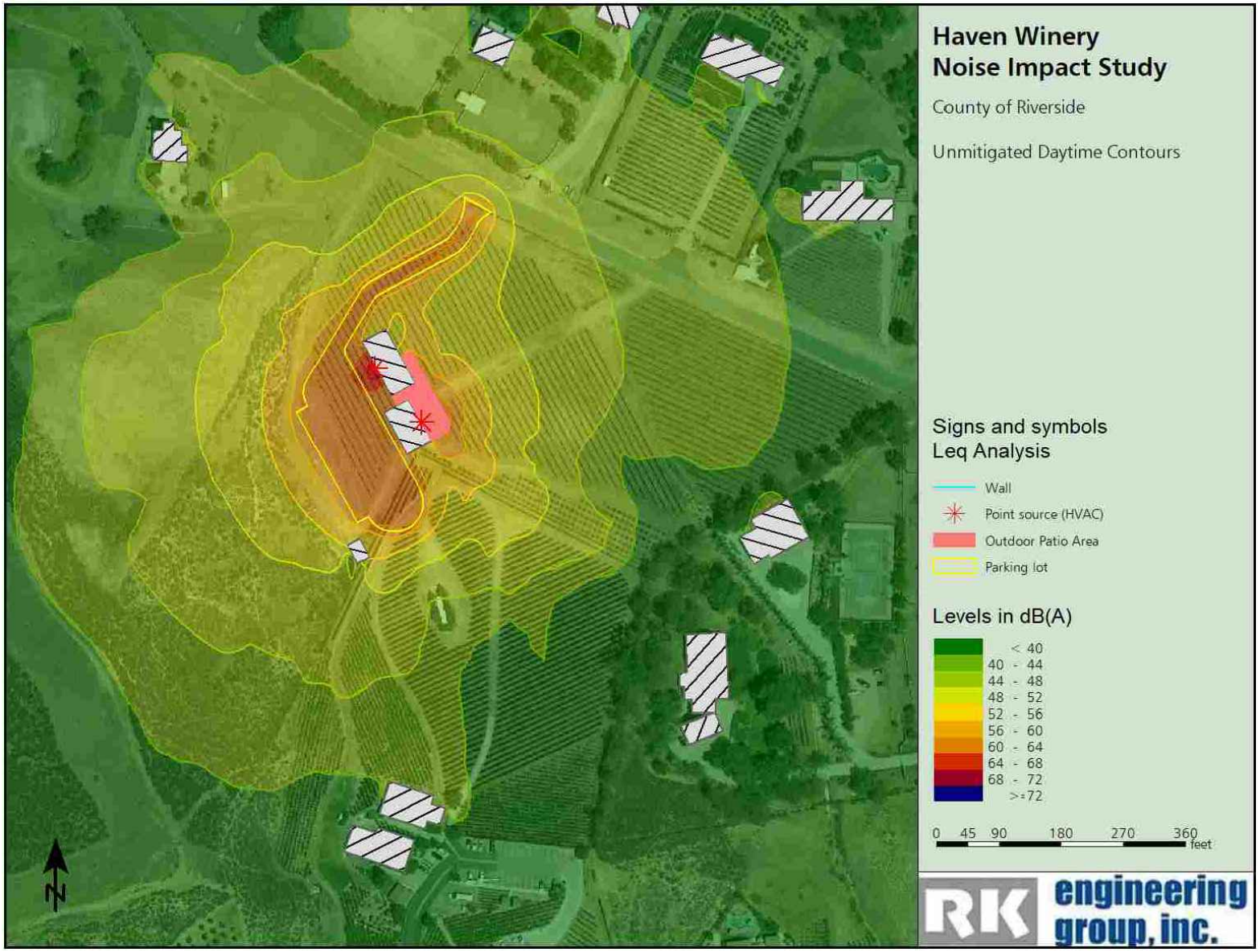


Exhibit F

Typical Operational Noise Contours - Nighttime

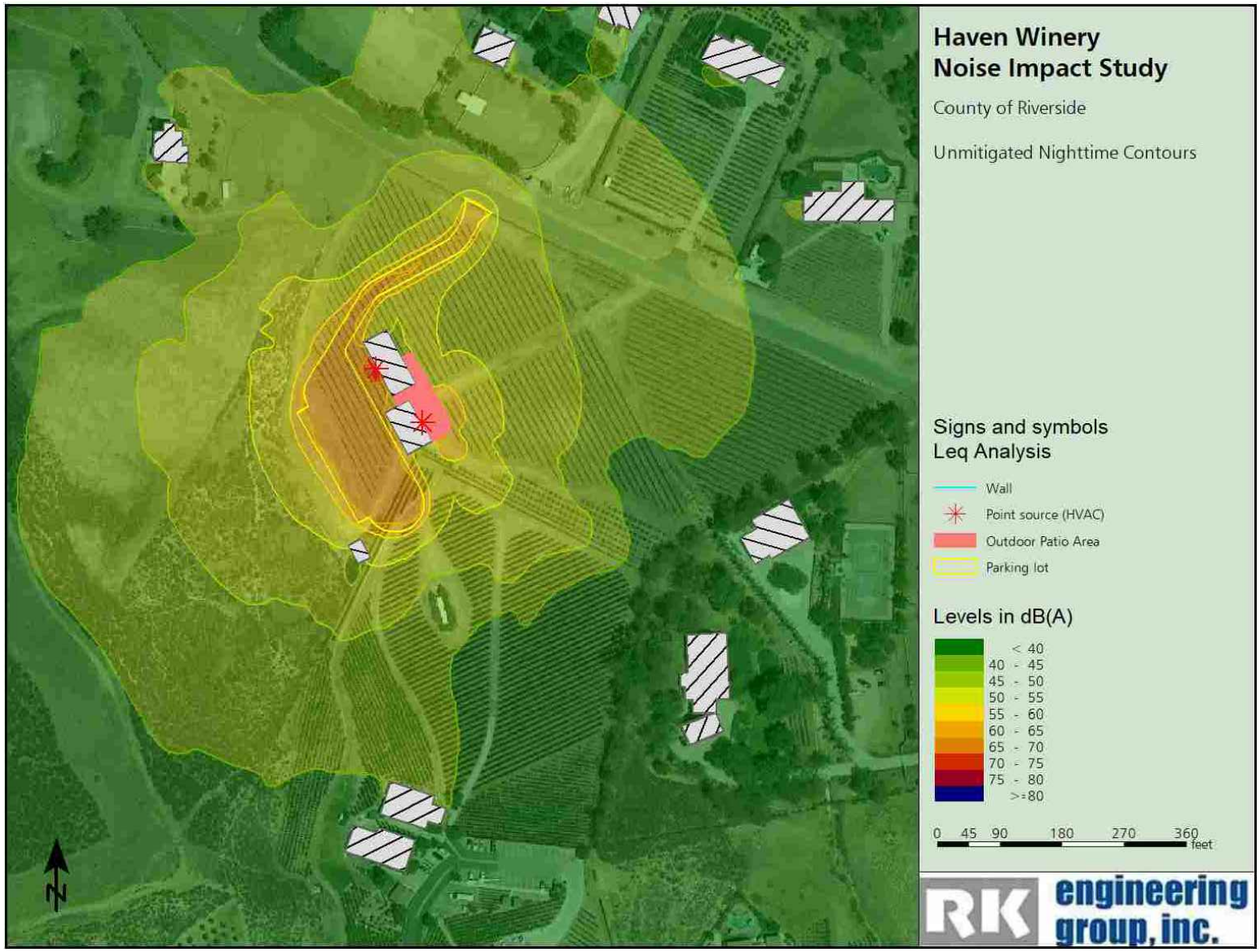


Exhibit G

Mitigated Typical Operational Day/Night Noise Levels (dBA)

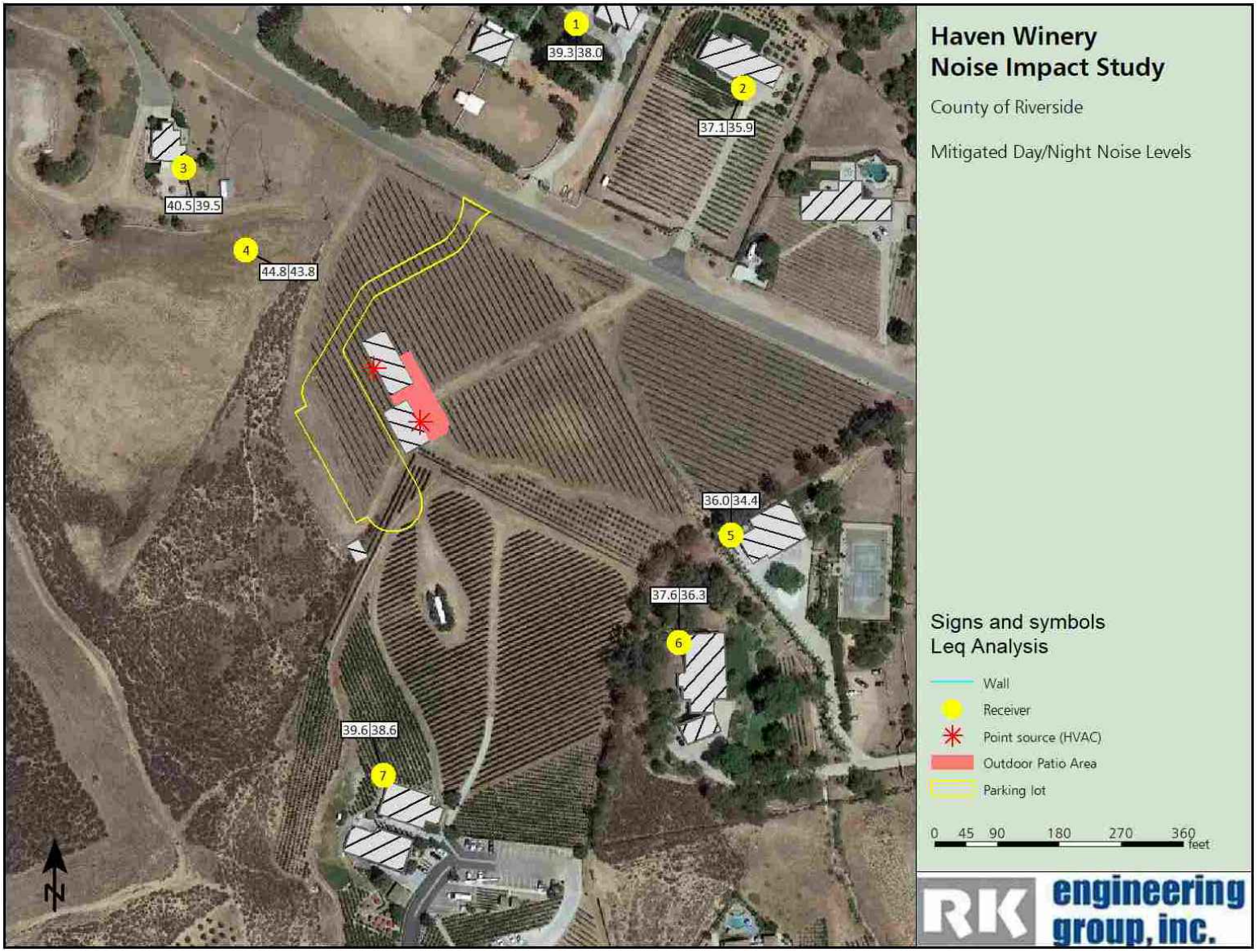


Exhibit H

Mitigated Typical Operational Noise Contours - Daytime

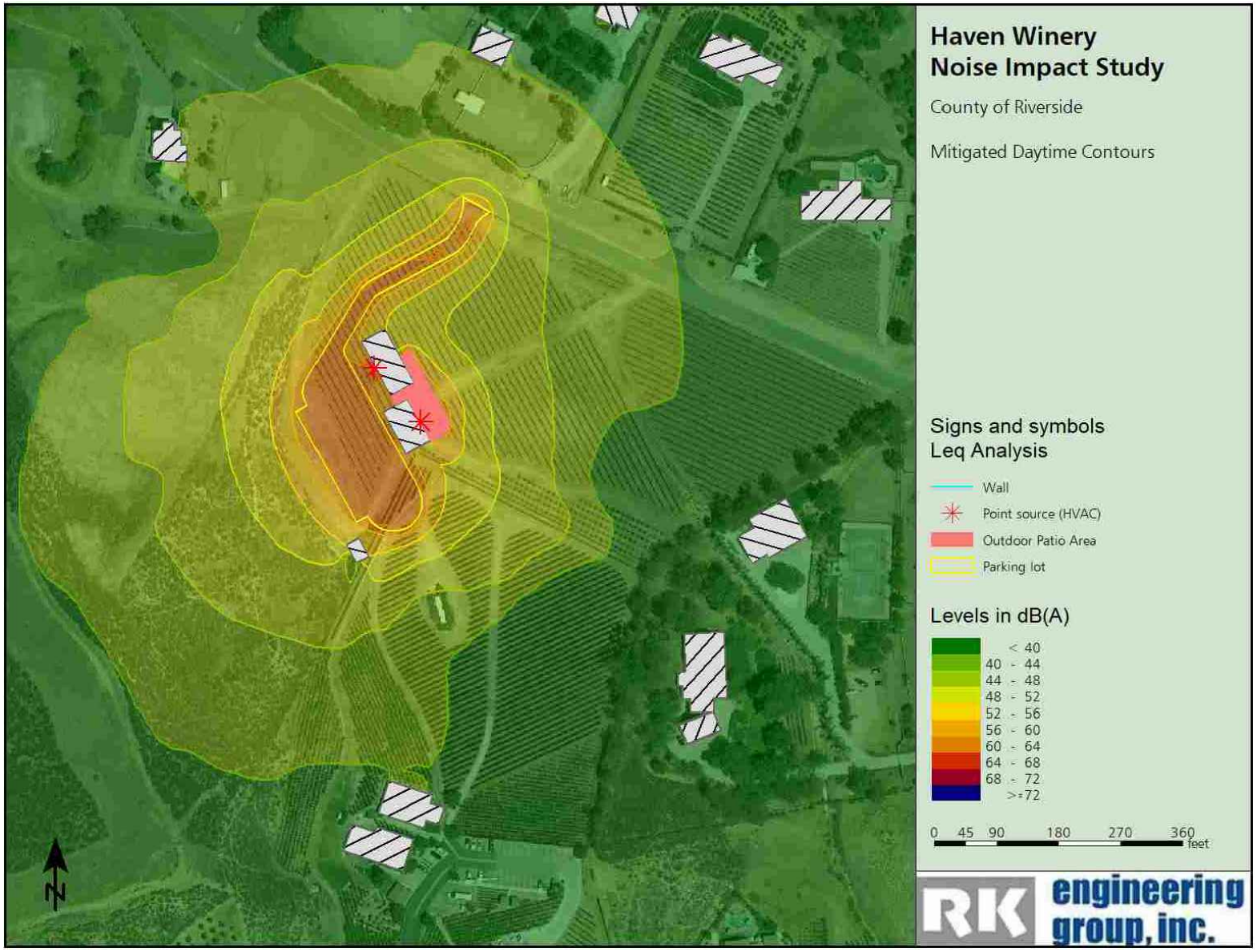
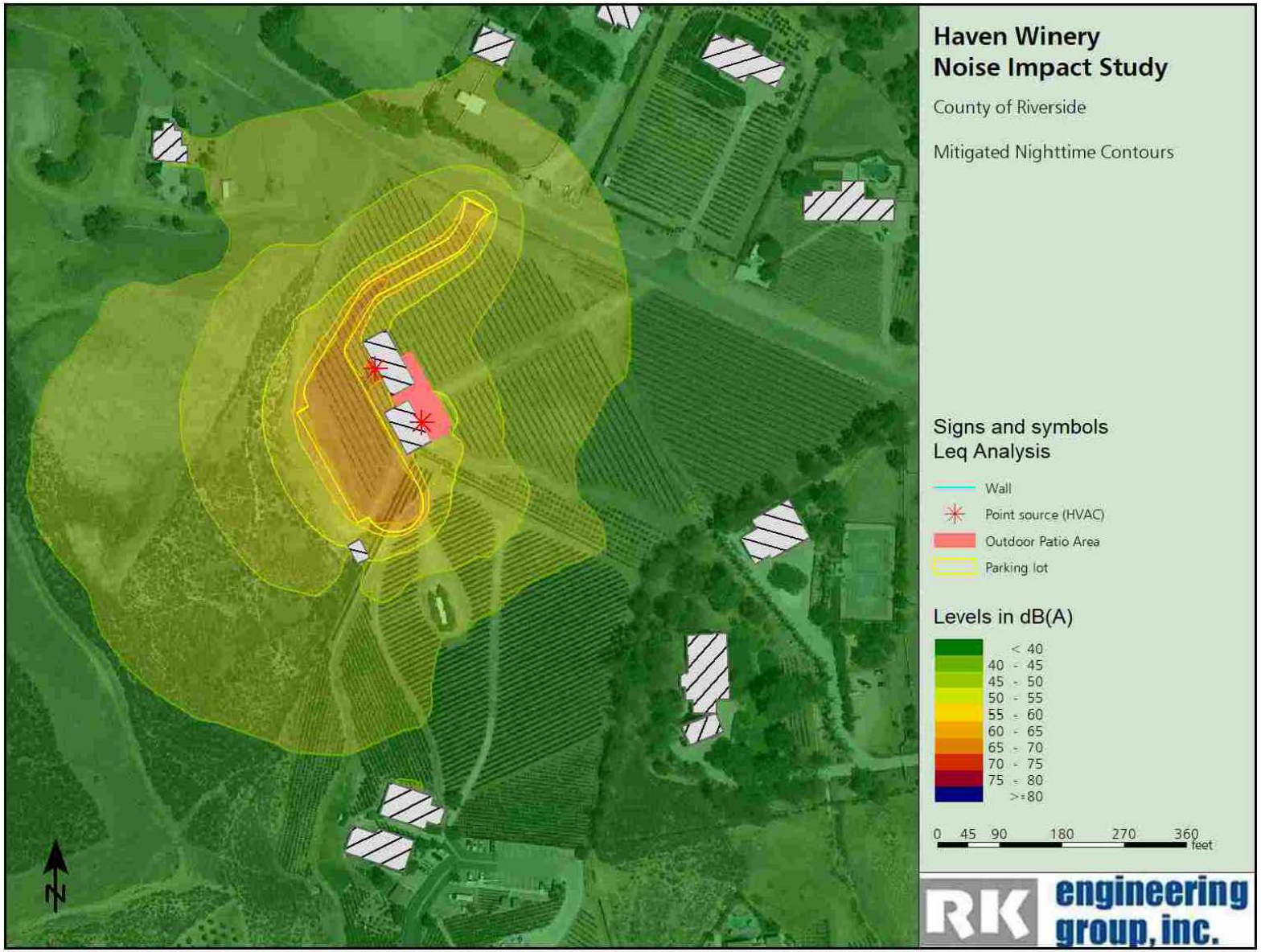


Exhibit I

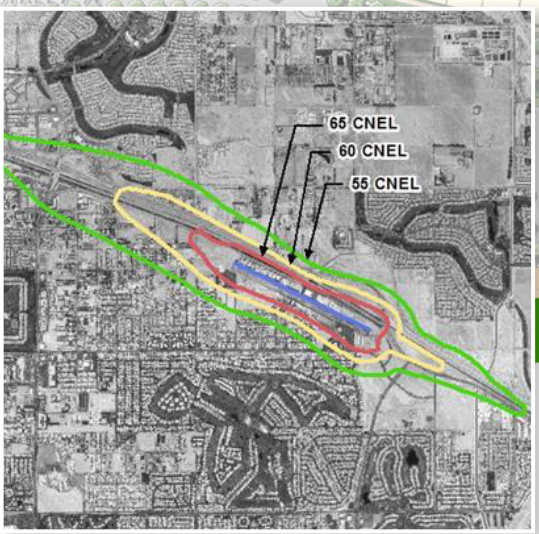
Mitigated Typical Operational Noise Contours - Nighttime



Appendices

Appendix A

County of Riverside
General Plan Noise Element and
Municipal Code Noise Control



Noise Element

Revised: December 8, 2015

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Chapter 7
Noise Element

Definitions

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The level of sound that impacts a property varies greatly during the day. As an example, the sound near an airport may be relatively quiet when no airplane is taking off or landing, but will be extremely loud as a plane takes off. In order to deal with these variations, several noise indices have been developed, which measure how loud each sound is, how long it lasts, and how often the sound occurs. The indices express all the sound occurring during the day as a single average level, which if it occurred all day would convey the same sound energy to the site.

Following is a list of commonly used terms and abbreviations that may be found within this element or when discussing the topic of noise. This is an abbreviated glossary to be reviewed prior to reading the element. It is important to become familiar with the definitions listed in order to better understand the importance of the Noise Element within the County of Riverside General Plan. Since the disbanding of the State of California Office of Noise Control in the mid-1990, the State of California Office of Planning and Research General Plan Guidelines can offer further information on other noise-related resources.

Ambient Noise: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL (Community Noise Equivalent Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

dB (Decibel): The unit of measure that denotes the ratio between two quantities that are proportional to power; the number of decibels corresponding to the ratio of the two amounts of power is based on a logarithmic scale.

dBA (A-weighted decibel): The A-weighted decibel scale discriminates upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale is based on a reference pressure level of 20 micropascals.

Intrusive Noise: That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency and time of occurrence, and tonal or informational content as well as the prevailing noise level.

L_{10}: The A-weighted sound level exceeded 10% of the sample time. Similarly, L_{50}, L_{90}, etc.

Sound refers to anything that is or may be perceived by the ear.

Noise is defined as "unwanted sound" because of its potential to disrupt sleep, rest, work, communication, and recreation, to interfere with speech communication, to produce physiological or psychological damage, and to damage hearing.

L_{eq} (Equivalent energy level): The average acoustic energy content of noise during the time it lasts. 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, no matter what time of day they occur. The County of Riverside uses a 10-minute L_{eq} measurement.

L_{dn} (Day-Night Average Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. Note: CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour.

Micropascal: The international unit for pressure, similar to pounds per square inch. 20 micropascals is the human hearing threshold. The scale ranges from zero for the average least perceptible sound to about 130 for the average pain level

Noise Contours: Lines drawn around a noise source indicating equal levels of noise exposure. CNEL and Ldn are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

Introduction

Tinnitus: The perception of ringing, hissing, or other sound in the ears or head when no external sound is present. For some people, tinnitus is just a nuisance. For others, it is a life-altering condition. In the United States, an estimated 12 million people have tinnitus to a distressing degree.

Before the alarm clock sounds, the lawn mower next door begins to roar. Then, while listening to the morning news on the radio, an airplane flies overhead and deadens all sound in the neighborhood. Once outside, the neighbor's stereo can be heard a block away. And during the morning commute, car horns, rumbling mufflers, and whirring motorcycles serenade motorists on the highway. Even in the most rural areas of Riverside County, the eternal battle between the efficiency of technology, and the noise it can create cannot be avoided.

As modern transportation systems continue to develop and human dependence upon machines continues to increase, the general level of noise in our day to day living environment rises. In Riverside County, residential areas near airports, freeways, and railroads are being adversely affected by annoying or hazardous noise levels. Other activities such as construction, operation of household power tools and appliances, and industry, also contribute to increasing background noise.

Addressing Noise Issues

The Noise Element is a mandatory component of the General Plan pursuant to the California Planning and Zoning Law, Section 65302(f). The element must recognize the guidelines adopted by the Office of Planning and

Research pursuant to Section 46050.1 of the Health and Safety Code. It also can be utilized as a tool for compliance with the State of California's noise insulation standards.

The General Plan Noise Element provides a systematic approach to identifying and appraising noise problems in the community; quantifying existing and projected noise levels; addressing excessive noise exposure; and community planning for the regulation of noise. This element includes policies, standards, criteria, programs, diagrams, a reference to action items, and maps related to protecting public health and welfare from noise.

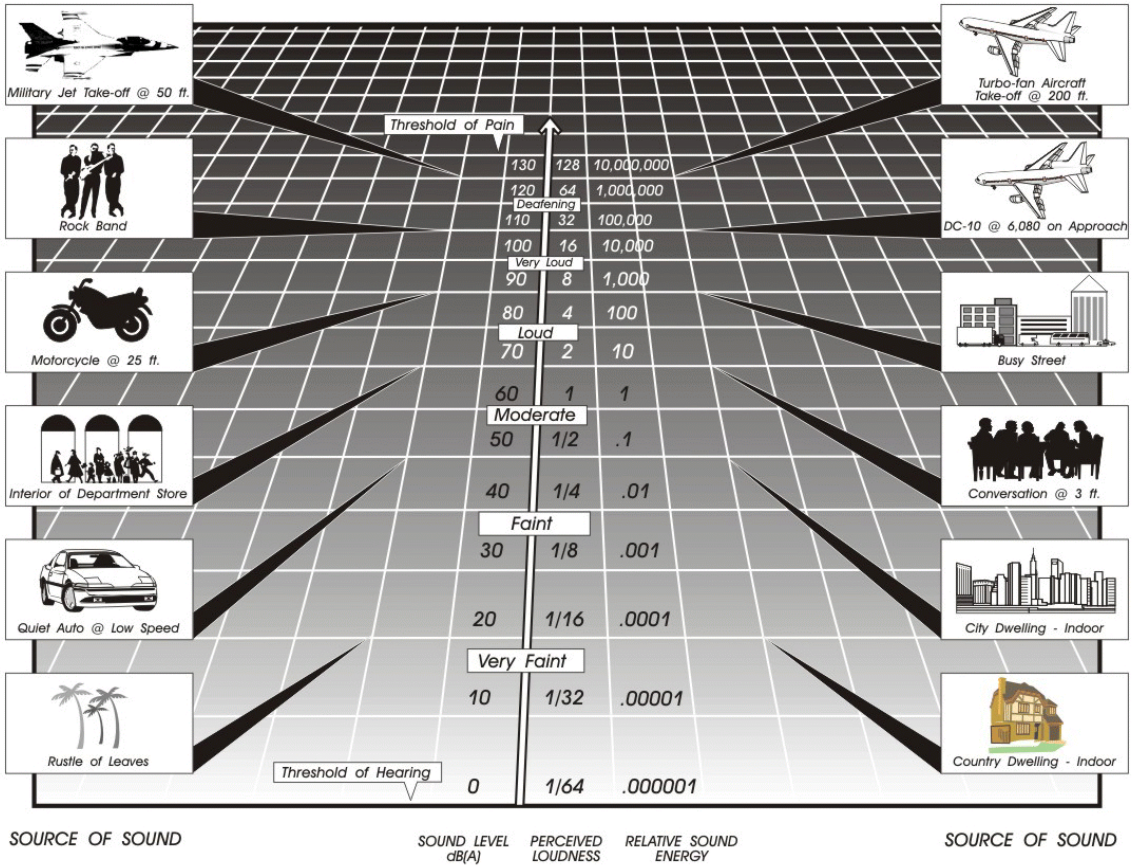
Setting

Riverside County is a continuously evolving group of communities that relies heavily upon the modern technological conveniences of American society to thrive and succeed as a pleasant and desirable place to live and work. Without such necessities as air-conditioning, heating, generators, and cars, living in an urban, suburban, rural, desert, or mountainous environment becomes difficult, if not impossible. Fortunately, these amenities are available to the residents of Riverside County and are used every day, often all day long. Unfortunately, these technological advances can come at a high price to residents' and visitors' ears.

The philosophical view commonly held by Riverside County staff and residents is that noise, which may be perceived by some to be annoying, may not be noticed at all by others. It is also important to note that people who move into an area where a noise source already exists (such as near an existing highway) are often more tolerant of that noise source than when a new noise generator locates itself in an established area that may be noise-sensitive (such as a stadium that is constructed near an established community).

Noise within Riverside County is generated by numerous sources found near places where people live and work. These sources are of particular concern when the noise they generate reaches levels above the prevailing background noise. There are many different types of noise, including mobile, stationary, and construction-related, that affect noise-sensitive receptors such as residences, schools, and hospitals. Figure N-1, Common Noise Sources and Noise Levels, illustrates some noise producers that can be found within Riverside County, as well as their corresponding noise measurement. The following sections contain policies that address the issues of noise producers and their effects on noise-sensitive land uses.

Figure N- 1 Common Noise Sources and Noise Levels



Noise Sensitive Land Uses

A series of land uses have been deemed sensitive by the State of California. These land uses require a serene environment as part of the overall facility or residential experience. Many of these facilities depend on low levels of sound to promote the wellbeing of the occupants. These uses include, but are not necessarily limited to; schools, hospitals, rest homes, long term care facilities, mental care facilities, residential uses, places of worship, libraries, and passive recreation areas. Activities conducted in proximity to these facilities must consider the noise output, and ensure that they don't create unacceptable noise levels that may unduly affect the noise-sensitive uses. The following policies address issues related to noise-sensitive land uses.

Noise Compatibility

The Noise Element of the General Plan is closely related to the Land Use Element because of the effects that noise has on sensitive land uses. Noise-producing land uses must be compatible with adjacent land uses in order for the Land Use Plan to be successful. Land uses that emit noise are measured in A-weighted decibels (dBA) or Community Noise Equivalent Level (CNEL). If existing land uses emit noise above a certain level, they are not

compatible with one another, and therefore noise attenuation devices must be used to mitigate the noise to acceptable levels indoors and outdoors. In cases of new development, the placement of noise-sensitive land uses is integral to a successful community. Table N-1, Land Use Compatibility for Community Noise Exposure, reveals the noise acceptability levels for different land uses. Areas around airports may have different or more restrictive noise standards than those cited in Table N-1 (See Policy N 1.3 below).The following policies protect noise-sensitive land uses from noise emitted by outside sources, and prevent new projects from generating adverse noise levels on adjacent properties.

Policies:

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used. (AI 107)

N 1.2 Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors or within the projected noise contours of any adjacent airports. (AI 107)

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

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

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

Areas around airports may have different noise standards than those cited above. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix L-1 and summarized in the Policy Area section of the affected Area Plan. (AI 105)

The General Plan policy and implementation item reference system:

LU 1.3: Identifies which element contains the Policy, in this case the Land Use Element, and the sequential number.

AI 1 and AI 4: Reference to the relevant Action Items contained in the Implementation Program found in Appendix K.

Please contact the Office of Industrial Hygiene for more information on acoustical specialists

N 1.4 Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys. (AI 106, 109)

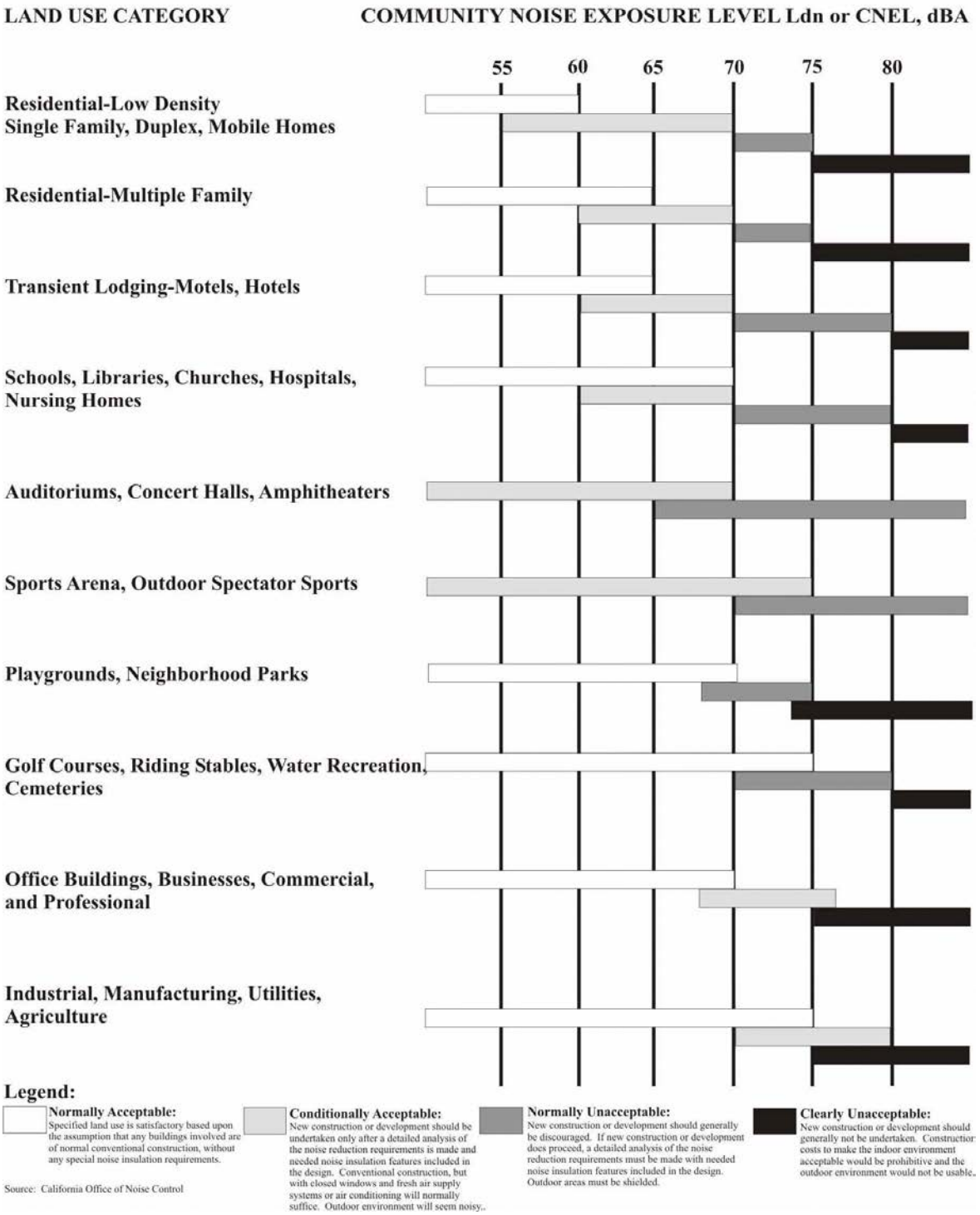
N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County. (AI 105, 106, 108)

N 1.6 Minimize noise spillover or encroachment from commercial and industrial land uses into adjoining residential neighborhoods or noise-sensitive uses. (AI 107)

N 1.7 Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem. (AI 106, 107)

N 1.8 Limit the maximum permitted noise levels that cross property lines and impact adjacent land uses, except when dealing with noise emissions from wind turbines. Please see the Wind Energy Conversion Systems section for more information. (AI 108)

Table N-1
Land Use Compatibility for Community Noise Exposure



Noise Mitigation Strategies

Many land uses emit noise above state-mandated acceptable levels. The noise emitted from a land use must be mitigated to acceptable levels indoors and outdoors in order for other, more noise-sensitive land uses to locate in proximity to these noise producers. There are a number of ways to mitigate noise and the following policies suggest some possible solutions to noise problems.

Policies:

N 2.1 Create a County Noise Inventory to identify major noise generators and noise-sensitive land uses, and to establish appropriate noise mitigation strategies. (AI 105)

N 2.2 Require a qualified acoustical specialist to prepare acoustical studies for proposed noise-sensitive projects within noise impacted areas to mitigate existing noise. (AI 105, 107)

N 2.3 Mitigate exterior and interior noises to the levels listed in Table N-2 below to the extent feasible, for stationary sources: (AI 105)

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

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

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

Noise Producers

Location of Noise Producers

> *"Good neighbors keep their noise to themselves."*

The communities of Riverside County need a variety of land uses in order to thrive and succeed. These land uses may provide jobs, clean water, ensure safety, ship goods, and ease transportation woes. But they may also emit high levels of noise throughout the day. These noise-producing land uses can complement a community when the noise they emit is properly mitigated. The following policies suggest a series of surveys and analyses to correctly identify the proper noise mitigating procedures in order to promote the continued success of the communities of Riverside County.

Agriculture

One of the major economic thrusts of Riverside County is the agricultural industry. The Riverside County Right-to-Farm Ordinance conserves, protects, and encourages the development, improvement, and continued viability of agricultural land and industries for the long-term production of food and other agricultural products, and for the economic well-being of Riverside County's residents. The Right-to-Farm Ordinance also attempts to balance the rights of farmers to produce food and other agricultural products with the rights of non-farmers who own,

occupy, or use land within or adjacent to agricultural areas. The Riverside County Right-to-Farm Ordinance also works to reduce the burden of Riverside County's agricultural resources by limiting the circumstances under which agricultural operations may be deemed a nuisance. Policies within this section address the potential noise issues that may be raised in regards to agricultural production.

Policies:

N 3.1 Protect Riverside County's agricultural resources from noise complaints that may result from routine farming practices, through the enforcement of the Riverside County Right-to-Farm Ordinance. (AI 105, 107)

N 3.2 Require acoustical studies and subsequent approval by the Planning Department and the Office of Industrial Hygiene, to help determine effective noise mitigation strategies in noise-producing areas. (AI 105)

N 3.3 Ensure compatibility between industrial development and adjacent land uses. To achieve compatibility, industrial development projects may be required to include noise mitigation measures to avoid or minimize project impacts on adjacent uses. (AI 107)

N 3.4 Identify point-source noise producers such as manufacturing plants, truck transfer stations, and commercial development by conducting a survey of individual sites. (AI 106)

N 3.5 Require that a noise analysis be conducted by an acoustical specialist for all proposed projects that are noise producers. Include recommendations for design mitigation if the project is to be located either within proximity of a noise-sensitive land use, or land designated for noise-sensitive land uses. (AI 109)

N 3.6 Discourage projects that are incapable of successfully mitigating excessive noise. (AI 107)

N 3.7 Encourage noise-tolerant land uses such as commercial or industrial, to locate in areas already committed to land uses that are noise-producing. (AI 107)

Stationary Noise

A stationary noise producer is any entity in a fixed location that emits noise. Stationary noise producers are common in many noise-sensitive areas. Motors, appliances, air conditioners, lawn and garden equipment, power tools, and generators are often found in residential neighborhoods, as well as on or near the properties of schools, hospitals, and parks. These structures are often a permanent fixture and are required for the particular land use. Industrial and manufacturing facilities are also stationary noise producers that may affect sensitive land uses. Furthermore, while noise generated by the use of motor vehicles over public roads is preempted from local regulation, the County of Riverside considers the use of these vehicles to be a stationary noise source when operated on private property such as at a truck terminal or warehousing facility. The emitted noise from the producer can be mitigated to acceptable levels either at the source or on the adjacent property through the use of proper planning, setbacks, blockwalls, acoustic-rated windows, dense landscaping, or by changing the location of the noise producer. The following policies identify mechanisms to measure and mitigate the noise emitted from stationary noise producers.

Community Noise Inventory

There are a series of noise producers within Riverside County that bear special recognition. These uses may be important parts of the economic health of Riverside County, but they still emit noise from time to time. Some of the special noise producers within Riverside County include, but are not limited to the Riverside Raceway, surface mining, truck transfer stations in the Mira Loma area, manufacturing facilities, and natural gas transmission pipelines.

Three high pressure natural gas transmission pipelines are located in the community of Cabazon (within the Pass Area Plan), and a series of valve stations are placed along the pipeline throughout the community. The pipelines supply a major portion of the non-transportation energy supply for Southern California. The depressurization of mainline valves at the valve stations for emergency or maintenance reasons can result in noise levels exceeding 140 dB L_{eq} at a distance of 50 feet from the source for more than an hour at a time. The pipelines are not located in heavily populated areas; however, should higher-intensity uses be approved in the area in the future, possible relocation of one or more pipelines or valves may be necessary.

Policies:

N 4.1 Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels: (AI 105)

a. 45 dBA-10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.

b. 65 dBA-10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

N 4.2 Develop measures to control non-transportation noise impacts. (AI 105)

N 4.3 Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented. (AI 105, 106, 109)

N 4.4 Require that detailed and independent acoustical studies be conducted for any new or renovated land uses or structures determined to be potential major stationary noise sources. (AI 105)

A **pure tone** is a single frequency tone with no harmonic content (e.g. hum).

N 4.5 Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business licenses or prior to the approval and/or issuance of new conditional use permits for said facilities. (AI 105, 107)

N 4.6 Establish acceptable standards for residential noise sources such as, but not limited to, leaf blowers, mobile vendors, mobile stereos and stationary noise sources such as home appliances, air conditioners, and swimming pool equipment. (AI 105)

N 4.7 Evaluate noise producers for the possibility of pure-tone producing noises. Mitigate any pure tones that may be emitted from a noise source. (AI 106, 107)

N 4.8 Require that the parking structures, terminals, and loading docks of commercial or industrial land uses be designed to minimize the potential noise impacts of vehicles on the site as well as on adjacent land uses. (AI 106, 107)

Wind Energy Conversion Systems (WECS)

Wind energy is a unique resource found only in a portion of Riverside County. Wind Energy Conversion Systems (WECS) are used to harness the energy found in strong gusts of wind. In order to fully capitalize on this special commodity, a large number of wind turbines have been placed in a portion of the Coachella Valley and San Gorgonio Pass within Riverside County. There are some residential areas spread throughout Riverside County that may also capitalize on wind-generated power. Though there is minimal residential development in the immediate areas where these windmills are located, the potential for noise and ground-borne vibration in neighboring developed areas may occur. The Wind Implementation Monitoring Program, designed and implemented by Riverside County, guides the policy direction for this area.

Policies:

N 5.1 Enforce the Wind Implementation Monitoring Program (WIMP).

N 5.2 Encourage the replacement of outdated technology with more efficient technology with less noise impacts. (AI 105)

Mobile Noise

Mobile noise sources may be one of the most annoying noise producers in a community because they are louder than background noises and more intense than many acceptable stationary noise sources. Though the noise emitted from mobile sources is temporary, it is often more disturbing because of its abruptness, especially single noise-producing events such as vehicle backfires. Common mobile noise sources include on-road vehicles, aircraft, and trains. The policies in this section identify common mobile noise sources, and suggest mitigation techniques to reduce the annoyance and burden of mobile noise sources on noise-sensitive receptors.

Please see the **Circulation Element** for further policies regarding transportation and noise related issues.

Policies:

N 6.1 Consider noise reduction as a factor in the purchase of County maintenance equipment and their use by County contractors and permittees. (AI 108)

N 6.2 Investigate the feasibility of retrofitting current County-owned vehicles and mechanical equipment to comply with noise performance standards consistent with the best available noise reduction technology. (AI 108)

N 6.3 Require commercial or industrial truck delivery hours be limited when adjacent to noise-sensitive land uses unless there is no feasible alternative or there are overriding transportation benefits. (AI 105, 107)

N 6.4 Restrict the use of motorized trail bikes, mini-bikes, and other off-road vehicles in areas of the county except where designated for that purpose. Enforce strict operating hours for these vehicles in order to minimize noise impacts on sensitive land uses adjacent to public trails and parks. (AI 105, 108)

☞

The following airports are located within or have a direct effect on Riverside County. Please see Appendix L-1 for a map with each airport=s noise contours. Also see the area plans and airport land use plans for more specific airport-related policies:

- Banning Municipal Airport
- Bermuda Dunes Airport
- Blythe Airport
- Chino Airport
- Corona Municipal Airport
- Chiriaco Summit Airport
- Jacqueline Cochran Regional Airport
- Flabob Airport
- French Valley Airport
- Hemet-Ryan Airport
- March Joint Air Reserve Base/March Inland Port
- Palm Springs International Airport
- Perris Valley Airport
- Riverside Municipal Airport
- Skylark Airport

Transportation

The most common mobile noise sources in Riverside County are transportation-related. Motor vehicle noise is of concern because it is characterized by a high number of individual events, which often create a higher sustained noise level in proximity to areas sensitive to noise exposure. Rail and aircraft operations, though less frequent, may generate extremely high noise levels that can be disruptive to daily activities. Though mass transit has not yet been developed within Riverside County, it is important to consider the noise that may be generated from transit service.

Airports

With the dynamic growth in aviation, aircraft noise will remain a challenging environmental problem and one that will affect an increasing number of people as air traffic routes and procedures change in the future. Aircraft noise appears to produce the greatest community anti-noise response, although the duration of the noise from a single airplane is much less, for example, than that from a freight train. There is great economic benefit to gain from airports of any size, although living in proximity to an airport will necessarily result in exposure to aircraft noise.

There are fourteen public use or military airports that are located within or have a direct effect on Riverside County. The land under the flight paths of each airport was monitored to determine the amount of noise emitted by common aircraft taking-off and landing at any given airport. Noise contours were created based on the measurements from the monitoring program. The CNEL noise contour(s) for the following airports have been depicted in the applicable Area Plan's Airport Influence Area section:

- Banning Municipal Airport
- Bermuda Dunes Airport
- Blythe Airport
- Chino Airport

- Chiriaco Summit Airport
- Corona Municipal Airport
- Jacqueline Cochran Regional Airport
- Flabob Airport
- French Valley Airport
- Hemet-Ryan Airport
- March Joint Air Reserve Base
- Riverside Municipal Airport

Airport Land Use Compatibility Plans have been created for most airports within Riverside County, and they should be referenced for further information regarding airports. Helicopters and heliports are also potential sources of noise, but due to the relatively low frequency and short duration of their operation in most circumstances, these operations do not significantly affect average noise levels within Riverside County. The following general policies address the noise that comes from airports and the aircraft they service.

Policies:

N 7.1 New land use development within Airport Influence Areas shall comply with airport land use noise compatibility criteria contained in the corresponding airport land use compatibility plan for the area. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix I-1and summarized in the Policy Area section of the affected Area Plan.

N 7.2 Adhere to applicable noise compatibility criteria when making decisions regarding land uses adjacent to airports. Refer to the Airports section of the Land Use Element (Page LU-32) and the Airport Influence Area sections of the corresponding Area Plans.

N 7.3 Prohibit new residential land uses, except construction of a single-family dwelling on a legal residential lot of record, within the current 60 dB CNEL contours of any currently operating public-use, or military airports. The applicable noise contours are as defined by the Riverside County Airport Land Use Commission and depicted in Appendix I-1, as well as in the applicable Area Plan's Airport Influence Area section.

N 7.4 Check each development proposal to determine if it is located within an airport noise impact area as depicted in the applicable Area Plan's Policy Area section regarding Airport Influence Areas. Development proposals within a noise impact area shall comply with applicable airport land use noise compatibility criteria.

Chocolate Mountain Aerial Gunnery Range

A portion of the Chocolate Mountain Aerial Gunnery Range (CMAGR) is located in Riverside County, between the Eastern Coachella Valley Area Plan and East County Desert Areas. The CMAGR has served as a military

aerial bombing and gunnery training range since the 1940s. It is a centerpiece in a much larger training complex, known as the Bob Stump Training Range Complex, that incorporates adjacent and nearby special use airspaces and ranges located in southeast California and southwest Arizona. This complex supports full-spectrum combat operations so that Marines can realistically train as they will fight. The CMAGR's desert mountain terrain is ideal for air-to-ground attack and air-to-air combat training. Tactical military exercises involve live explosives and large force-on-force aviation training. Noise emitting from training exercises may extend past the CMAGR boundaries.

Policies:

N 8.1 Prohibit residential development, except construction of a single-family dwelling on a legal residential lot of record, within the current 60 dB CNEL contours of the Chocolate Mountain Aerial Gunnery Range.

Vehicular

Please see the **Circulation Element** for more in-depth information regarding Level of Service Standards, Average Daily Trips, and other information related to vehicular circulation.

Roadway traffic is one of the most pervasive sources of noise within Riverside County. Traffic noise varies in how it affects land uses depending upon the type of roadway, and the distance of the land use from that roadway. Some variables that affect the amount of noise emitted from a road are speed of traffic, flow of traffic, and type of traffic (e.g. tractor trailers versus cars). Another variable affecting the overall measure of noise is a perceived increase in sensitivity to vehicular noise at night. Appendix I-1 contains tables and figures that illustrate existing and forecasted noise from roadways throughout Riverside County. The existing noise measurements were obtained by measuring noise at different points adjacent to the roadway. The future noise contours along freeways and major highways, also located in Appendix I-1, were created from the results of traffic modeling to project the noise of major roadways in the future. The following policies address the issues of roadway traffic noise, and suggest methods to reduce the noise impact of roads on adjacent and nearby land uses.

Policies:

N 9.1 Enforce all noise sections of the State Motor Vehicle Code.

N 9.2 Ensure the inclusion of noise mitigation measures in the design of new roadway projects in the county. (AI 105)

N 9.3 Require development that generates increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses to provide for appropriate mitigation measures. (AI 106)

N 9.4 Require that the loading and shipping facilities of commercial and industrial land uses, which abut residential parcels be located and designed to minimize the potential noise impacts upon residential parcels. (AI 105)

N 9.5 Employ noise mitigation practices when designing all future streets and highways, and when improvements occur along existing highway segments. These mitigation measures will

emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas. (AI 105)

N 9.6 Require that all future exterior noise forecasts use Level of Service C, and be based on designed road capacity or 20-year projection of development (whichever is less) for future noise forecasts. (AI 106)

N 9.7 Require that field noise monitoring be performed prior to siting to any sensitive land uses along arterial roadways. Noise level measurements should be of at least 10 minutes in duration and should include simultaneous vehicle counts so that more accurate vehicle ratios may be used in modeling ambient noise levels. (AI 106)

> *"Calling noise a nuisance is like calling smog an inconvenience. Noise must be considered a hazard to the health of people everywhere."*
>
> *-The Surgeon General*

Mass Transit

Currently, the County of Riverside does not participate in or provide any rail transit services though public transportation is becoming a more desirable option for many travelers and commuters in Riverside County. Transit can be an alternative to driving a car through congested Riverside County freeways. Currently, the noise generated by public transportation within Riverside County affects only a very small percentage of the total residential population. As years pass, and the need for public transportation increases, there will be a greater number of residents affected by the noise that buses, transit oases shuttles, light rail, and trains will produce. The following policies address the issues of noise related to public transit.

> Please see the **Circulation Element** for additional policies related to transit development and rail systems.

Policies:

N 10.1 Encourage local and regional public transit providers to ensure that the equipment they operate and purchase is state-of-the-art and does not generate excessive noise impacts on the community. (AI 108)

N 10.2 Encourage the use of quieter electric-powered vehicles. (AI 108)

N 10.3 Encourage the development and use of alternative transportation modes including bicycle paths and pedestrian walkways to minimize vehicular noise within sensitive receptor areas.

N 10.4 Actively participate in the development of noise abatement plans for freeways and rapid transit. (AI 108)

An at-grade railroad crossing is one where the street and the rail line form an intersection, and physically cross one-another.

Rail

The rail system within Riverside County criss-crosses its way through communities, industrial areas, rural areas, and urban centers. Trains carry passengers, freight, and cargo to local and regional destinations day and night. Rail transportation may become more popular in the future if a mass public transportation system is implemented within Riverside County. Currently, daily train traffic produces noise that may disrupt activities in proximity to railroad tracks. For instance, trains are required to sound their horns at all at-grade crossings, and they may also be required to slow their speed through residential areas. These types of noise disturbances can interfere with activities conducted on noise-sensitive land uses. Exhibits showing existing railroad noise contours can be found in Appendix I-1. These exhibits provide purely illustrative contours along rail lines throughout Riverside County. The following policies suggest actions that could minimize the impacts of train noise on noise-sensitive land uses.

Policies:

N 11.1 Check all proposed projects for possible location within railroad noise contours using typical noise contour diagrams. (AI 106, 109)

N 11.2 Minimize the noise effect of rail transit (freight and passenger) on residential uses and other sensitive land uses through the land use planning process. (AI 106, 109)

N 11.3 Locate light rail and fixed rail routes and design rail stations in areas that are accessible to both residential and commercial areas, but also minimize noise impacts on surrounding residential and sensitive land uses. (AI 106, 109)

N 11.4 Install noise mitigation features where rail operations impact existing adjacent residential or other noise-sensitive uses. (AI 108)

N 11.5 Restrict the development of new sensitive land uses to beyond the 65 decibel CNEL contour along railroad rights-of-way. (AI 106, 109)

Building and Design

One of the most effective means of reducing noise in a sensitive area is to construct and design buildings in such a way that the noise is deflected in such a way that it does not affect the occupants. If the building has already been constructed, then landscaping and design techniques can be used to tastefully absorb the noise emitted from mobile or stationary sources. These building and design techniques should serve two purposes; to mitigate noise to acceptable indoor and outdoor levels, and to enhance the community character rather than detract from its surroundings. The following policies have been included in the Noise Element to ensure that the character of each community within Riverside County is preserved while minimizing noise to acceptable levels.

Natural Barriers and Landscaping

Policies:

N 12.1 Utilize natural barriers such as hills, berms, boulders, and dense vegetation to assist in noise reduction. (AI 108)

N 12.2 Utilize dense landscaping to effectively reduce noise. However, when there is a long initial period where the immaturity of new landscaping makes this approach only marginally effective, utilize a large number of highly dense species planted in a fairly mature state, at close intervals, in conjunction with earthen berms, setbacks, or block walls. (AI 108)

Temporary Construction

Policies:

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable practices. (AI 105, 108)

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas. (AI 105, 108)

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

a. Temporary noise attenuation fences;

b. Preferential location of equipment; and

c. Use of current noise suppression technology and equipment. (AI 107)

N 13.4 Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer. (AI 105, 108)

Building and Design Techniques

Policies:

N 14.1 Enforce the California Building Standards that sets standards for building construction to mitigate interior noise levels to the tolerable 45 CNEL limit. These standards are utilized in conjunction with the Uniform Building Code by the County's Building Department to ensure that noise protection is provided to the public. Some design features may include extra-dense insulation, double-paned windows, and dense construction materials.

N 14.2 Continue to develop effective strategies and mitigation measures for the abatement of noise hazards reflecting effective site design approaches and state-of-the-art building technologies. (AI 108)

N 14.3 Incorporate acoustic site planning into the design of new development, particularly large scale, mixed-use, or master-planned development, through measures which may include:

- Separation of noise-sensitive buildings from noise-generating sources.
- Use of natural topography and intervening structure to shield noise-sensitive land uses.
- Adequate sound proofing within the receiving structure. (AI 106)

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Non-habitable areas within a home include:

- kitchens
- bathrooms
- hallways
- garages
- closets
- utility rooms
- laundry rooms

N 14.4 Consider and, when necessary, to lower noise to acceptable limits, require noise barriers and landscaped berms. (AI 108)

N 14.5 Consider the issue of adjacent residential land uses when designing and configuring all new, non-residential development. Design and configure on-site ingress and egress points that divert traffic away from nearby noise-sensitive land uses to the greatest degree practicable. (AI 106, 107)

N 14.6 Prevent the transmission of excessive and unacceptable noise levels between individual tenants and businesses in commercial structures and between individual dwelling units in multi-family residential structures. (AI 105, 108)

N 14.7 Assist the efforts of local homeowners living in high noise areas to noise attenuate their homes through funding assistance and retrofitting program development, as feasible. (AI 105, 108)

N 14.8 Review all development applications for consistency with the standards and policies of the Noise Element of the General Plan.

N 14.9 Mitigate 600 square feet of exterior space to 65 dB CNEL when new development is proposed on residential parcels of 1 acre or greater.

Mixed Use

Policies:

N 15.1 Minimize the potential adverse noise impacts associated with the development of mixed-use structures where residential units are located above or adjacent to commercial uses. (AI 106, 107, 108)

N 15.2 Require that commercial and residential mixed-use structures minimize the transfer or transmission of noise and vibration from the commercial land use to the residential land use. (AI 105)

N 15.3 Minimize the generation of excessive noise level impacts from entertainment and restaurant/bar establishments into adjacent residential or noise-sensitive uses. (AI 105, 107)

Vibration

Another community annoyance related to noise is vibration. As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized by displacement, velocity, and/or acceleration. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration.

Vibration can be felt outdoors, but the perceived intensity of vibration impacts are much greater indoors, due to the shaking of the structure. Some of the most common sources of vibration come from trains and/or transit vehicles, construction equipment, airplanes, and large vehicles. Several land uses are especially sensitive to vibration, and therefore have a lower vibration threshold. These uses include, but are not limited to, concert halls, hospitals, libraries, vibration-sensitive research operations, residential areas, schools, and offices.

Table N-3, Human Reaction to Typical Vibration Levels, presents the human reaction to various levels of peak particle velocity. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies. However, due to their suspension systems, city buses often generate frequencies around 30 Hz at high vehicle speeds. It is more uncommon, but possible, to measure traffic frequencies above 30 Hz.

Amplitude-the distance that a vibrating particle travels from a fixed point.

Frequency-the number of wave cycles that occur in 1 second.

Hertz (Hz)-the unit by which frequency is measured.

Displacement-a measure of the distance that a vibrated particle travels from its original position.

Velocity-the rate of speed at which particles move in inches per second or millimeters per second.

Acceleration-the rate of change in velocity with respect to time.

Table N-3:
Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (inches/second)	Human Reaction
0.0059-0.0188	Threshold of perception, possibility of intrusion
0.0787	Vibrations readily perceptible
0.0984	Continuous vibration begins to annoy people
0.1968	Vibrations annoying to people in buildings
0.3937-0.5905	Vibrations considered unpleasant when continuously subjected and unacceptable by some walking on bridges

Source: Caltrans, 1992

Policies:

N 16.1 Restrict the placement of sensitive land uses in proximity to vibration-producing land uses. (AI 105)

N 16.2 Consider the following land uses sensitive to vibration:

- Hospitals;
- Residential areas;
- Concert halls;
- Libraries;
- Sensitive research operations;
- Schools; and
- Offices

N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

Noise Information Management

Current and projected noise data and maps for Riverside County require constant updating and review in order for the information to remain correct as well as accurate. Currently, there is no central noise information database available for Riverside County staff or residents to reference when noise inquiries arise. This information is necessary and should be easily accessible when reviewing potential development plans, building a new home, siting an industrial area, evaluating circulation routes, or conducting other advanced planning activities. The following policies guide the County of Riverside to create a database, or central location, where up-to-date information can be accessed by Riverside County Staff or residents.

Mapping

Policies:

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Please see **Table N-1** for more information in order to determine a noise threshold necessary for creating a noise database.

N 17.1 Identify, quantify, and map noise producers and provide noise contour diagrams as is practical. (AI 109)

N 17.2 Identify and map noise-sensitive land uses throughout the county. (AI 109)

N 17.3 Identify and map point-source noise producers such as surface mines, wind turbines, manufacturing plants, truck transfer stations, active recreational facilities, and amphitheaters. (AI 109)

Noise Data Management

Policies:

N 18.1 Maintain baseline information, on an ongoing basis, regarding ambient and stationary noise sources. (AI 105)

N 18.2 Monitor and update available data regarding the community's existing and projected ambient stationary noise levels.

N 18.3 Assure that areas subject to noise hazards are identified, quantified, and mapped in a form that is available to decision makers. (AI 109)

N 18.4 Develop and maintain a detailed, comprehensive noise data base. (AI 106)

N 18.5 Develop and update county noise inventories using the following steps.

a. Identify noise sources and noise-sensitive land uses

b. Continue to identify various agency responsibilities, review noise complaint files, and conduct noise surveys and monitoring, as needed.

N 18.6 Identify those areas of the county affected by high noise levels. (AI 106, 107, 109)

N 18.7 Evaluate current land uses to identify potential noise conflict areas. (AI 106, 107, 109)

N 18.8 Gather activity operations' data of noise sources; prepare analytical noise exposure models to develop existing and projected noise contours around major noise sources down to 50 CNEL. (AI 109)

N 18.9 Encourage greater involvement of other County departments in the identification, measurement, and reduction of noise hazards throughout the county, including: Building and Safety Department, Aviation Department, and the Department of Public Health-Office of Industrial Hygiene.

Public Noise Information

Policies:

N 19.1 Provide information to the public regarding the health effects of high noise levels and means of mitigating such levels. (AI 109)

N 19.2 Cooperate with industry to develop public information programs on noise abatement. (AI 108)

N 19.3 Condition that prospective purchasers or end users of property be notified of overflight, sight, and sound of routine aircraft operations by all effective means, including:

a. requiring new residential subdivisions that are located within the 60 CNEL contour or are subject to overflight, sight, and sound of aircraft from any airport, to have such information included in the State of California Final Subdivision Public Report.

b. requiring that Declaration and Notification of Aircraft Noise and Environmental Impacts be recorded and made available to prospective purchasers or end users of property located within the 60 CNEL noise contour for any airport or air station or is subject to routine aircraft overflight. (AI 109)

N 19.4 Promote increased awareness concerning the effects of noise and suggest methods by which the public can be of assistance in reducing noise.

N 19.5 Require new developments that have the potential to generate significant noise impacts to inform impacted users on the effects of these impacts during the environmental review process. (AI 106, 107)

ORDINANCE NO. 847
(AS AMENDED THROUGH 847.1)
AN ORDINANCE OF THE COUNTY OF RIVERSIDE AMENDING ORDINANCE NO. 847 REGULATING NOISE

The Board of Supervisors of the County of Riverside Ordains as Follows:

Section 1. INTENT. At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life. Pursuant to its police power, the Board of Supervisors hereby declares that noise shall be regulated in the manner described herein. This ordinance is intended to establish countywide standards regulating noise. This ordinance is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are hereby established.

Section 2. EXEMPTIONS. Sound emanating from the following sources is exempt from the provisions of this ordinance:

a. Facilities owned or operated by or for a governmental agency.
b. Capital improvement projects of a governmental agency.
c. The maintenance or repair of public properties.
d. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile.
e. Public or private schools and school-sponsored activities
f. Agricultural operations on land designated Agriculture in the Riverside County General Plan, or land zoned A-1 (Light Agriculture), A-P (Light Agriculture With Poultry), A-2 (Heavy Agriculture), A-D (Agriculture-Dairy) or C/V (Citrus/Vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile.
g. Wind Energy Conversion Systems (WECS), provided such systems comply with the WECS noise provisions of Riverside County Ordinance No. 348.
h. Private construction projects located one-quarter (1/4) of a mile or more from an inhabited dwelling.
i. Private construction projects located within one-quarter (1/4) of a mile from an inhabited dwelling, provided that:
    1. Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September; and
    2. Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May.

j. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of 7 a.m. and 8 p.m.

k. Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems

l. Heating and air conditioning equipment.

m. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare.

n. The discharge of firearms consistent with all state laws.

Section 3. DEFINITIONS. As used in this ordinance, the following terms shall have the following meanings:

a. Audio Equipment. A television, stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

b. Decibel (dB). A unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

1. A-weighting (dBA) means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.

2. Maximum Sound level (L_{max}) means the maximum sound level measured on a sound level meter.

c. Governmental Agency. The United States, the State of California, Riverside County, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

d. Land Use Permit. A discretionary permit issued by Riverside County pursuant to Riverside County Ordinance No. 348.

e. Motor Vehicle. A vehicle that is self-propelled.

f. Motor Vehicle Sound System. A stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

g. Noise. Any loud, discordant or disagreeable sound.

h. Occupied Property. Property upon which is located a residence, business or industrial or manufacturing use.

i. Off-Highway Vehicle. A motor vehicle designed to travel over any terrain.

j. Public Property. Property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

k. Public or Private School. An institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

l. Sensitive Receptor. A land use that is identified as sensitive to noise in the Noise Element of the Riverside County General Plan, including, but not limited to, residences, schools, hospitals, churches, rest homes, cemeteries or public libraries.

m. Sound Level Meter. An instrument meeting the standards of the American National Standards Institute for Type 1 or Type 2 sound level meters or an instrument that provides equivalent data.

n. Sound Amplifying Equipment. A loudspeaker, microphone, megaphone or other similar device.

Section 4. GENERAL SOUND LEVEL STANDARDS. No person shall create any sound, or allow the creation of any sound, on any property that causes the exterior sound level on any other occupied property to exceed the sound level standards set forth in Table 1.

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

Section 5. SOUND LEVEL MEASUREMENT METHODOLOGY. Sound level measurements may be made anywhere within the boundaries of an occupied property. The actual location of a sound level measurement shall be at the discretion of the enforcement officials identified in Section 8. of this ordinance. Sound level measurements shall be made with a sound level meter. Immediately before a measurement is made, the sound level meter shall be calibrated utilizing an acoustical calibrator meeting the standards of the American National Standards Institute. Following a sound level measurement, the calibration of the sound level meter shall be re-verified. Sound level meters and calibration equipment shall be certified annually.

Section 6. SPECIAL SOUND SOURCES STANDARDS. The general sound level standards set forth in Section 4. of this ordinance apply to sound emanating from all sources, including the following special sound sources, and the person creating, or allowing the creation of, the sound is subject to the requirements of that section. The following special sound sources are also subject to the following additional standards, the failure to comply with which constitute separate violations of this ordinance.

a. Motor Vehicles.
   1. Off-Highway Vehicles.
      i. No person shall operate an off-highway vehicle unless it is equipped with a USDA qualified spark arrester and a constantly operating and properly maintained muffler. A muffler is not considered constantly operating and properly maintained if it is equipped with a cutout, bypass or similar device.
      ii. No person shall operate an off-highway vehicle unless the noise emitted by the vehicle is not more than 96 dBA if the vehicle was manufactured on or after January 1, 1986 or is not more that 101 dBA if the vehicle was manufactured before January 1, 1986. For purposes of this subsection, emitted noise shall be measured a distance of twenty (20) inches from the vehicle tailpipe using test procedures established by the Society of Automotive Engineers under Standard J-1287.
   2. Sound Systems. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, between the hours of 10:00 p.m. and 8:00 a.m., such that the sound system is audible to the human ear inside any inhabited dwelling. No person shall operate a motor vehicle sound system, whether affixed to the vehicle or not, at any other time such that the sound system is audible to the human ear at a distance greater than one hundred (100) feet from the vehicle.

b. Power Tools and Equipment. No person shall operate any power tools or equipment between the hours of 10:00 p.m. and 8:00 a.m. such that the power tools or equipment are audible to the human ear inside an inhabited dwelling other than a dwelling in which the power tools or equipment may be located. No person shall operate any power tools or equipment at any other time such that the power tools

or equipment are audible to the human ear at a distance greater than one hundred (100) feet from the power tools or equipment.

c. Audio Equipment. No person shall operate any audio equipment, whether portable or not, between the hours of 10:00 p.m. and 8:00 a.m. such that the equipment is audible to the human ear inside an inhabited dwelling other than a dwelling in which the equipment may be located. No person shall operate any audio equipment, whether portable or not, at any other time such that the equipment is audible to the human ear at a distance greater than one hundred (100) feet from the equipment.

d. Sound Amplifying Equipment and Live Music. No person shall install, use or operate sound amplifying equipment, or perform, or allow to be performed, live music unless such activities comply with the following requirements. To the extent that these requirements conflict with any conditions of approval attached to an underlying land use permit, these requirements shall control.

1. Sound amplifying equipment or live music is prohibited between the hours of 10:00 p.m. and 8:00 a.m.
2. Sound emanating from sound amplifying equipment or live music at any other time shall not be audible to the human ear at a distance greater than two hundred (200) feet from the equipment or music.

Section 7. EXCEPTIONS. Exceptions may be requested from the standards set forth in Sections 4. or 6. of this ordinance and may be characterized as construction-related, single event or continuous events exceptions.

a. Application and Processing.

1. Construction-Related Exceptions. An application for a construction-related exception shall be made to and considered by the Director of Building and Safety on forms provided by the Building and Safety Department and shall be accompanied by the appropriate filing fee. No public hearing is required.
2. Single Event Exceptions. An application for a single event exception shall be made to and considered by the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. No public hearing is required.
3. Continuous Events Exceptions. An application for a continuous events exception shall be made to the Planning Director on forms provided by the Planning Department and shall be accompanied by the appropriate filing fee. Upon receipt of an application for a continuous events exception, the Planning Director shall set the matter for public hearing before the Planning Commission, notice of which shall be given as provided in Section 18.26.c. of Riverside County Ordinance No. 348. Notwithstanding the above, an application for a

continuous events exception that is associated with an application for a land use permit shall be processed concurrently with the land use permit in the same manner that the land use permit is required to be processed.

b. Requirements for Approval. The appropriate decision making body or officer shall not approve an exception application unless the applicant demonstrates that the activities described in the application would not be detrimental to the health, safety or general welfare of the community. In determining whether activities are detrimental to the health, safety or general welfare of the community, the appropriate decision making body or officer shall consider such factors as the proposed duration of the activities and their location in relation to sensitive receptors. If an exception application is approved, reasonable conditions may be imposed to minimize the public detriment, including, but not limited to, restrictions on sound level, sound duration and operating hours.

c. Appeals. The Director of Building and Safety's decision on an application for a construction-related exception is considered final. The Planning Director's decision on an application for a single event exception is considered final. After making a decision on an application for a continuous events exception, the appropriate decision making body or officer shall mail notice of the decision to the applicant. Within ten (10) calendar days after the mailing of such notice, the applicant or an interested person may appeal the decision to the Board of Supervisors. Upon receipt of an appeal and payment of the appropriate appeal fee, the Clerk of the Board shall set the matter for hearing not less than five (5) days nor more than thirty (30) days thereafter and shall give written notice of the hearing in the same manner as notice of the hearing was given by the appropriate hearing officer or body. The Board of Supervisors shall render its decision within thirty (30) days after the appeal hearing is closed.

d. Effect of a Pending Continuous Events Exception Application. For a period of one hundred and eighty (180) days from the effective date of this ordinance, no person creating any sound prohibited by this ordinance shall be considered in violation of this ordinance if the sound is related to a use that is operating pursuant to an approved land use permit, if an application for a continuous events exception has been filed to sanction the sound and if a decision on the application is pending.

Section 8. ENFORCEMENT. The Riverside County Sheriff and Code Enforcement shall have the primary responsibility for enforcing this ordinance; provided, however, the Sheriff and Code Enforcement may be assisted by the Public Health Department. Violations shall be prosecuted as described in Section 10. of this ordinance, but nothing in this ordinance shall prevent the Sheriff, Code Enforcement or the Department of Public Health from engaging in efforts to obtain voluntary compliance by means of warnings, notices, or educational programs.

Section 9. DUTY TO COOPERATE. No person shall refuse to cooperate with, or obstruct, the enforcement officials identified in Section 8. of this ordinance when they are engaged in the process of enforcing the provisions of this ordinance. This duty to cooperate may require a person to extinguish a sound source so that it can be determined whether sound emanating from the source violates the provisions of this ordinance.

Section 10. VIOLATIONS AND PENALTIES. Any person who violates any provision of this ordinance once or twice within a one hundred and eighty (180) day period shall be guilty of an infraction. Any person who violates any provision of this ordinance more than twice within a one hundred and eighty (180) day period shall be guilty of a misdemeanor. Each day a violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. Penalties shall not exceed the following amounts.

a. For the first violation within a one hundred and eighty (180) day period the minimum mandatory fine shall be five hundred dollars ($500).
b. For the second violation within a one hundred and eighty (180) day period the minimum mandatory fine shall be seven hundred and fifty dollars ($750).
c. For any further violations within a one hundred and eighty (180) day period the minimum mandatory fine shall be one thousand dollars ($1,000) or imprisonment in the County jail for a period not exceeding six (6) months, or both.

Section 11. SEVERABILITY. If any provision of this ordinance, or the application thereof to any person or circumstance, is held invalid, such invalidity shall not affect the remainder of the ordinance or the application of such provision(s) to other persons or circumstances.

Section 12. SAVINGS CLAUSE. The adoption of this ordinance shall not in any manner affect the prosecution of ordinance violations, which violations were committed prior to the effective date of this ordinance, nor be construed as a waiver of any permit, license, penalty or penal provisions applicable to such violations. The provisions of this ordinance, insofar as they are substantially the same as ordinance provisions previously adopted by Riverside County relating to the same subject matter, shall be construed as restatements and continuations, and not as new enactments.

Section 13. EFFECTIVE DATE. This ordinance shall take effect 30 days after its adoption.

Adopted: 847 Item 3.19 of 04/04/2006 (Eff: 05/04/2006)
Amended: 847.1 Item 3.4 of 06/19/2007 (Eff: 07/19/2007)

Appendix B

Field Data and Photos

Field Sheet

Project: Haven Winery Noise Impact Study **Engineer:** D. Shivaiah

Date: 6/9/2022
JN: 3035-2022-02

Measurement Address: **County:** Riverside
Southwest corner of De Portola Road and Camino Del Vino

Site No.: 1

Sound Level Meter:
Piccolo II
Serial # P0218042101
Serial # P0218092808
Serial # P0221010801
Serial # P0221010802

Calibrator:
CA114 Sound Calibrator
Serial # 500732

Calibration Record:

	Input, dB/	Cali. Date	Time
1	94.0		
2	94.0		
3	94.0		
4	94.0		

Notes:

Temp:	93
Windspeed:	4 MPH
Direction:	SW
Skies:	Clear
Camera:	
Photo Nos.	

Meter Settings:
☒ A-WTD ☐ LINEAR ☒ SLOW ☐ 1/1 OCT ☒ INTERVALS ___60____- MINUTE
☐ C-WTD ☐ IMPULSE ☐ FAST ☐ 1/3 OCT ☒ L_N PERCENTILE VALUES

Notes:

Measurement Type:
Long-term X
Short-term

RK engineering group, inc.

Field Sheet - Location-1 Photos

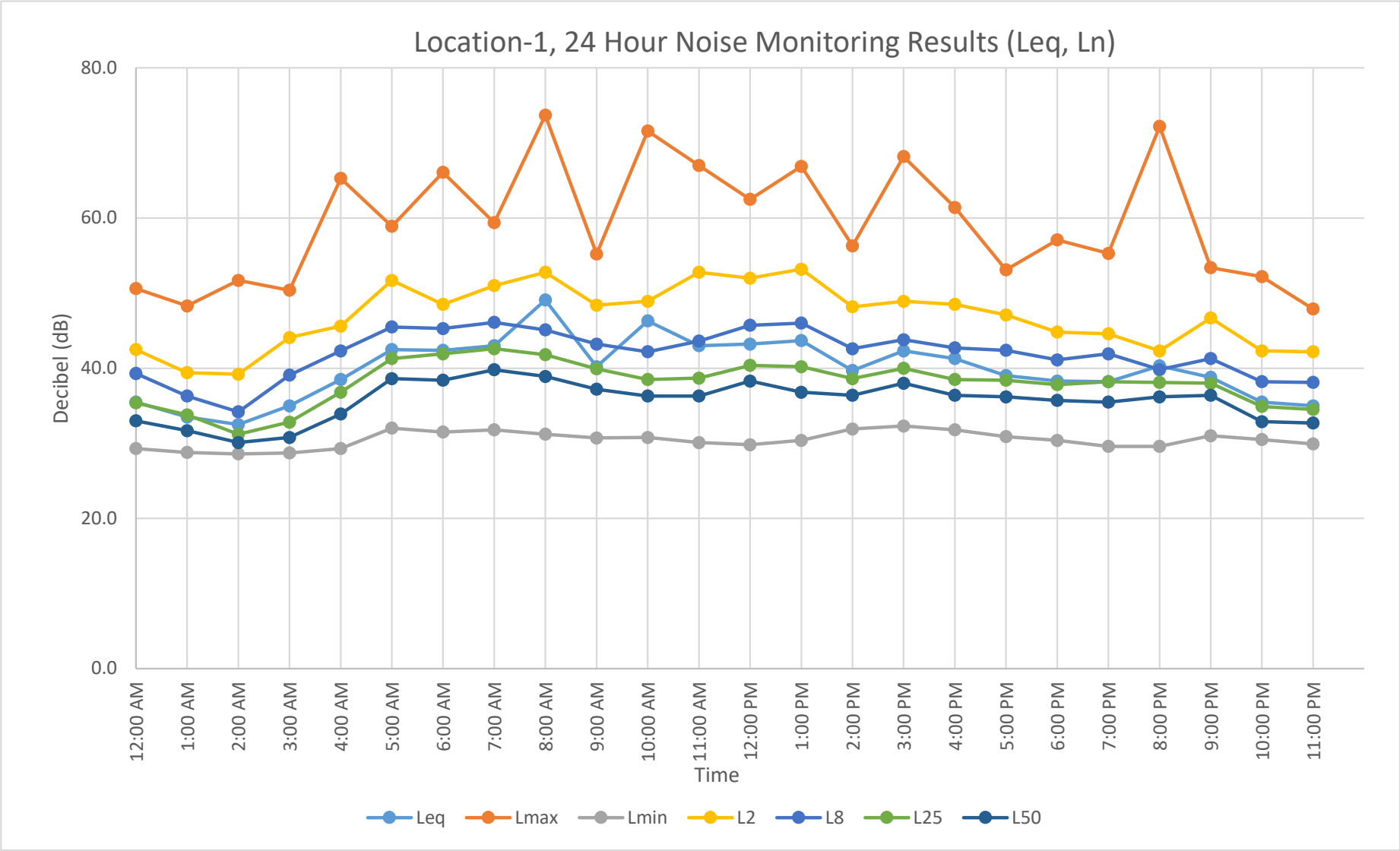
Project: Haven Winery Noise Impact Study	**Engineer:** D. Shivaiah	**Date:**	6/9/2022
		JN:	3035-2022-02
Measurement Address:	**County:** County of Riverside	**Site No.:**	1

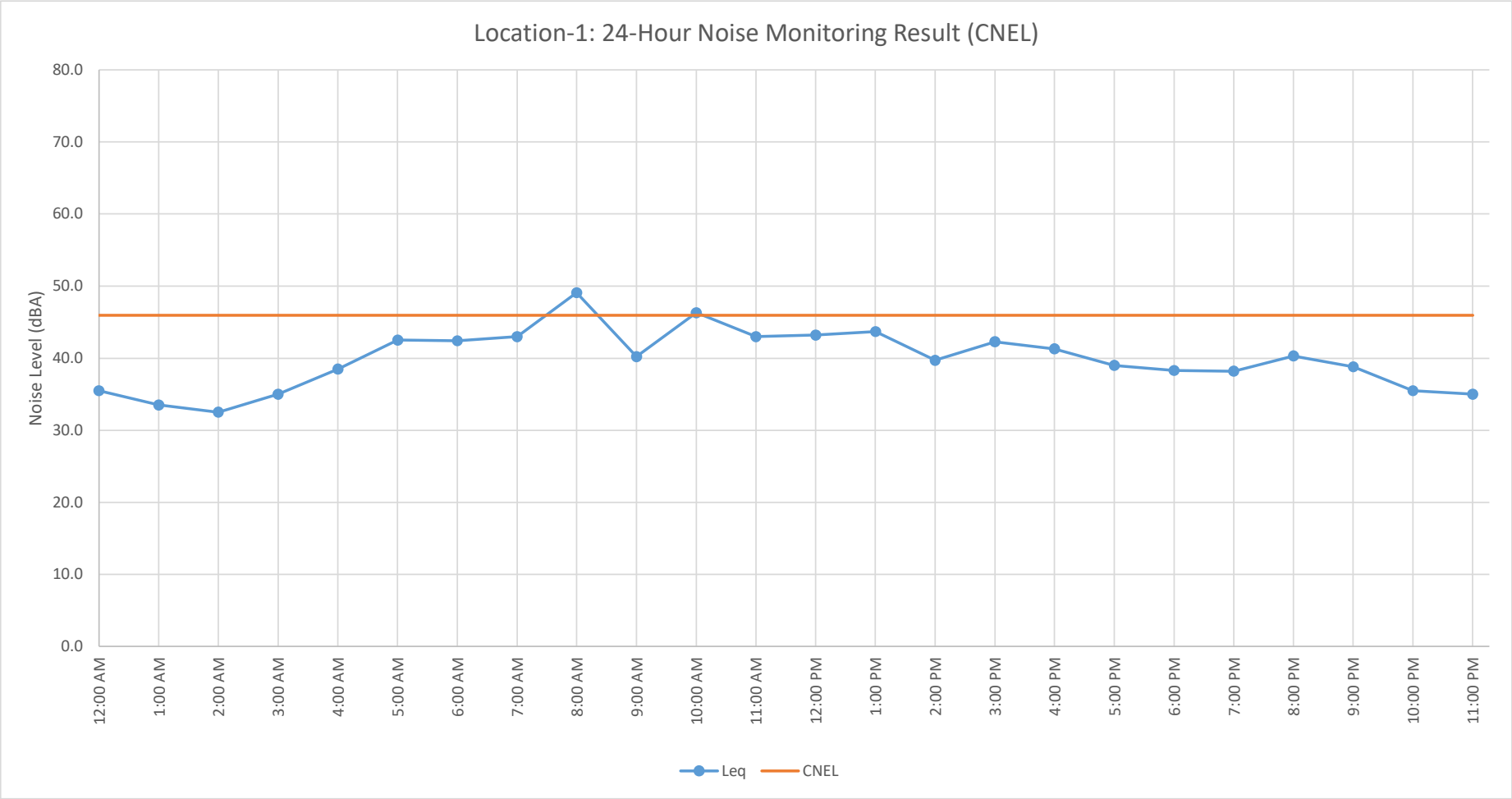
Long-term noise monitoring location one (LT-1) was taken approximately 415 feet from the centerline of Camino Del Vino and approximately 750 feet from the centerline of De Portola Road

RK engineering group, inc.

PROJECT:	Haven Winery Noise Impact Study	JOB #:	3035-2022-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement	DATE:	09-Jun-22
LOCATION:	Long-term noise monitoring location one (LT-1) was taken approximately 415 feet from the centerline of Camino Del Vino and approximately 750 feet from the centerline of De Portola Road	BY:	D. Shivaiah

Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	35.5	50.6	29.3	42.5	39.3	35.4	33.0
1:00 AM	33.5	48.3	28.8	39.4	36.3	33.8	31.7
2:00 AM	32.5	51.7	28.6	39.2	34.2	31.2	30.1
3:00 AM	35.0	50.4	28.7	44.1	39.1	32.8	30.8
4:00 AM	38.5	65.3	29.3	45.6	42.3	36.8	33.9
5:00 AM	42.5	58.9	32.0	51.7	45.5	41.3	38.6
6:00 AM	42.4	66.1	31.5	48.5	45.3	41.9	38.4
7:00 AM	43.0	59.4	31.8	51.0	46.1	42.6	39.8
8:00 AM	49.1	73.7	31.2	52.8	45.1	41.8	38.9
9:00 AM	40.2	55.2	30.7	48.4	43.2	39.9	37.2
10:00 AM	46.3	71.6	30.8	48.9	42.2	38.5	36.3
11:00 AM	43.0	67.0	30.1	52.8	43.6	38.7	36.3
12:00 PM	43.2	62.5	29.8	52.0	45.7	40.4	38.3
1:00 PM	43.7	66.9	30.4	53.2	46.0	40.2	36.8
2:00 PM	39.7	56.3	31.9	48.2	42.6	38.6	36.4
3:00 PM	42.3	68.2	32.3	48.9	43.8	40.0	38.0
4:00 PM	41.3	61.4	31.8	48.5	42.7	38.5	36.4
5:00 PM	39.0	53.1	30.9	47.1	42.4	38.4	36.2
6:00 PM	38.3	57.1	30.4	44.8	41.1	37.8	35.7
7:00 PM	38.2	55.3	29.6	44.6	41.9	38.2	35.5
8:00 PM	40.3	72.2	29.6	42.3	39.8	38.1	36.2
9:00 PM	38.8	53.4	31.0	46.7	41.3	38.0	36.4
10:00 PM	35.5	52.2	30.5	42.3	38.2	34.9	32.9
11:00 PM	35.0	47.9	29.9	42.2	38.1	34.5	32.7
Daytime	42.8	73.7	29.6	49.5	43.4	39.4	37.0
Nighttime	38.5	66.1	28.6	46.2	41.6	37.6	34.8


Location-1, 24 Hour Noise Monitoring Results (Leq, Ln)
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50


Location-1: 24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

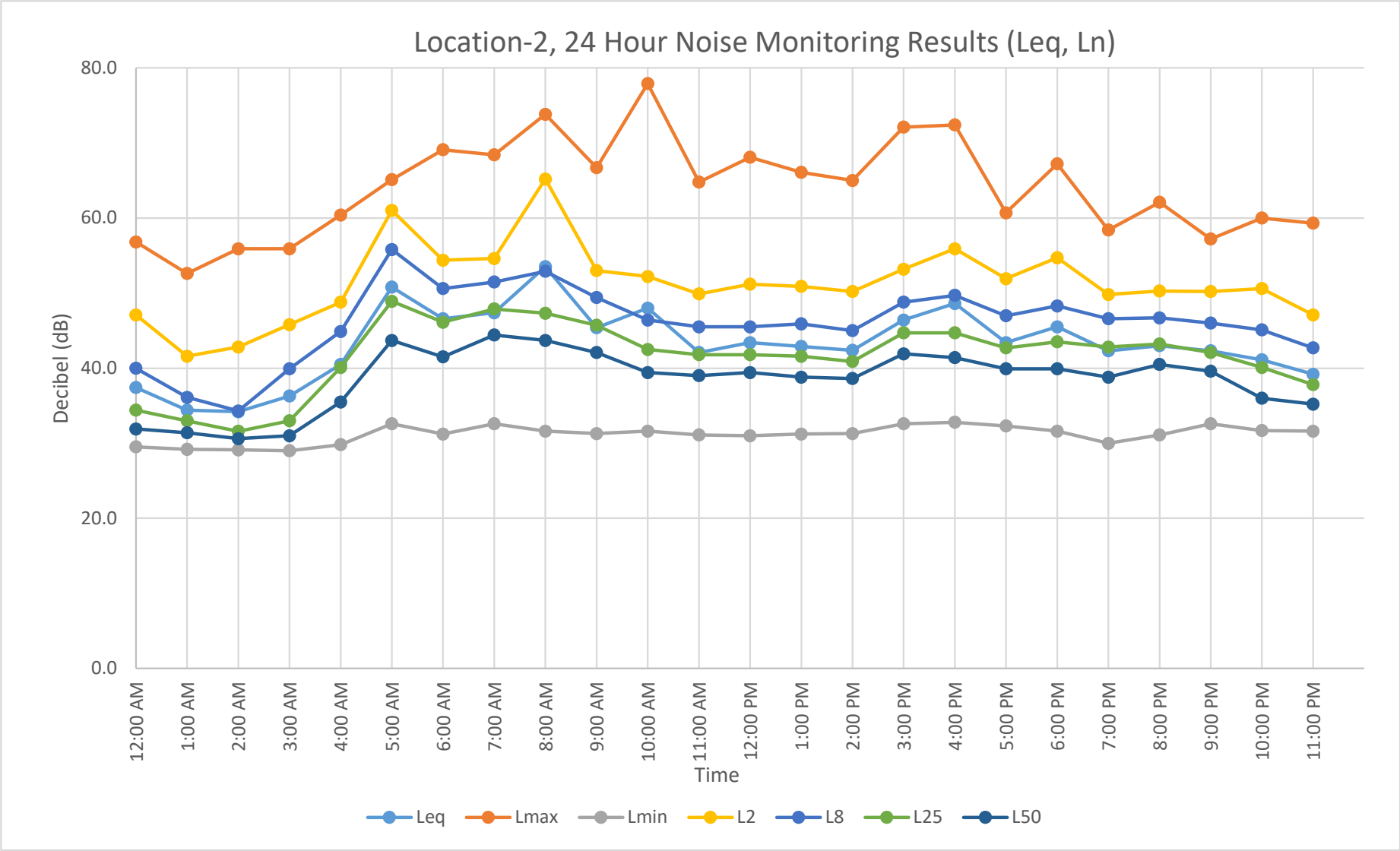
Field Sheet - Location-2 Photos

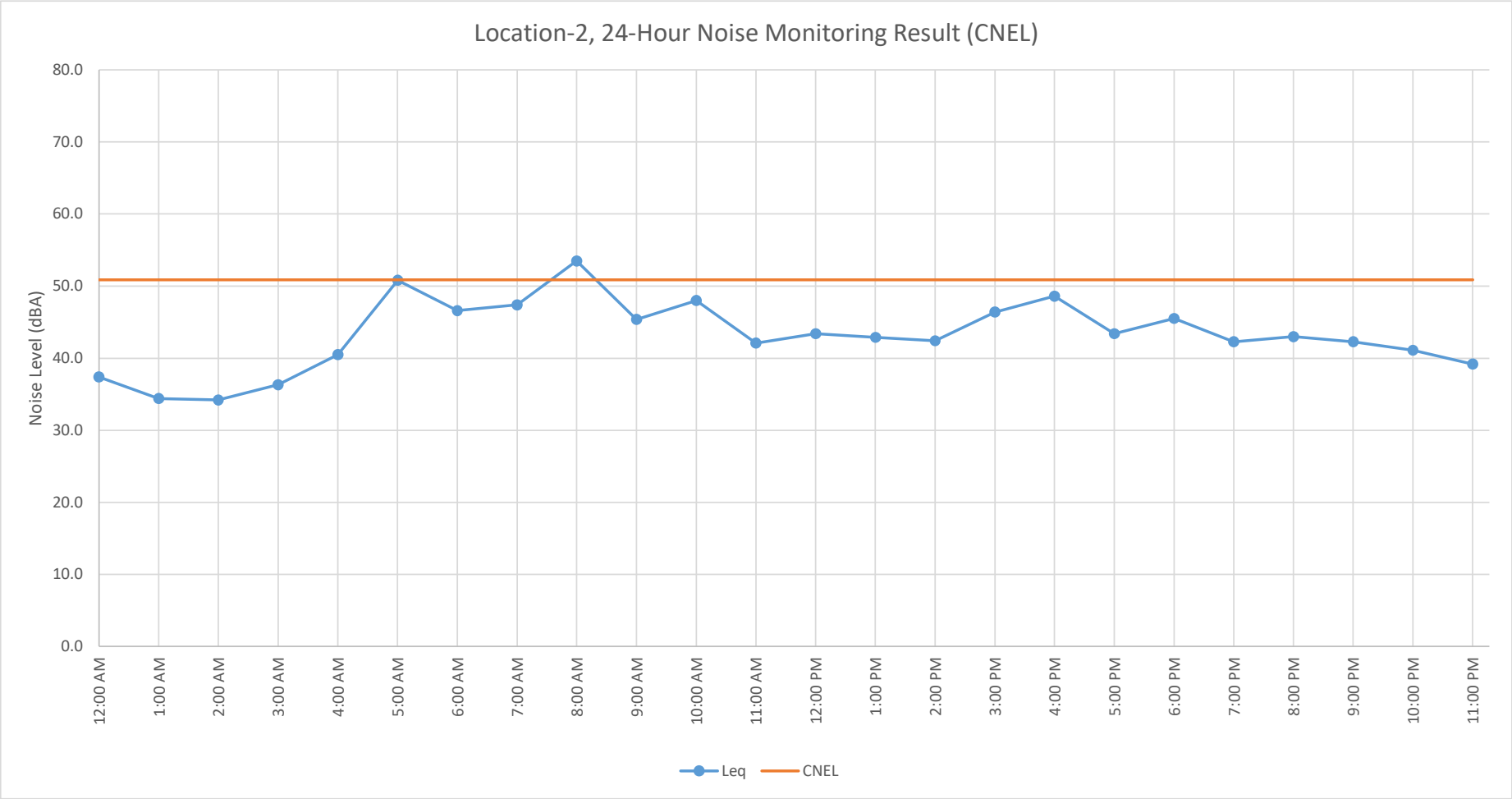
Project: Haven Winery Noise Impact Study	**Engineer:** D. Shivaiah	**Date:**	6/9/2022
		JN:	3035-2022-02
Measurement Address:	**County:** County of Riverside	**Site No.:**	2

Long-term noise monitoring location two (LT-2) was taken approximately 215 feet from the centerline of Camino Del Vino and approximately 35 feet from the western property line.

RK engineering group, inc.

PROJECT:	Haven Winery Noise Impact Study					JOB #:	3035-2022-02
NOISE METER	Piccolo II SLM, 24-Hour Measurement					DATE:	09-Jun-22
LOCATION:	Long-term noise monitoring location two (LT-2) was taken approximately 215 feet from the centerline of Camino Del Vino and approximately 35 feet from the western property line.					BY:	D. Shivaiah
Time	Leq	Lmax	Lmin	L2	L8	L25	L50
12:00 AM	37.4	56.8	29.5	47.1	40.0	34.4	31.9
1:00 AM	34.4	52.6	29.2	41.6	36.1	33.0	31.4
2:00 AM	34.2	55.9	29.1	42.8	34.3	31.6	30.6
3:00 AM	36.3	55.9	29.0	45.8	39.9	33.0	31.0
4:00 AM	40.5	60.4	29.8	48.8	44.9	40.1	35.5
5:00 AM	50.8	65.1	32.6	61.0	55.8	48.9	43.7
6:00 AM	46.6	69.1	31.2	54.4	50.6	46.1	41.5
7:00 AM	47.4	68.4	32.6	54.6	51.5	47.9	44.4
8:00 AM	53.5	73.8	31.6	65.2	52.9	47.3	43.7
9:00 AM	45.4	66.7	31.3	53.0	49.4	45.7	42.1
10:00 AM	48.0	77.9	31.6	52.2	46.4	42.5	39.4
11:00 AM	42.1	64.8	31.1	49.9	45.5	41.8	39.0
12:00 PM	43.4	68.1	31.0	51.2	45.5	41.8	39.4
1:00 PM	42.9	66.1	31.2	50.9	45.9	41.6	38.8
2:00 PM	42.4	65.0	31.3	50.2	45.0	40.9	38.6
3:00 PM	46.4	72.1	32.6	53.2	48.8	44.7	41.9
4:00 PM	48.6	72.4	32.8	55.9	49.7	44.7	41.4
5:00 PM	43.4	60.7	32.3	51.9	47.0	42.7	39.9
6:00 PM	45.5	67.2	31.6	54.7	48.3	43.5	39.9
7:00 PM	42.3	58.4	30.0	49.8	46.6	42.8	38.8
8:00 PM	43.0	62.1	31.1	50.3	46.7	43.2	40.5
9:00 PM	42.3	57.2	32.6	50.2	46.0	42.1	39.6
10:00 PM	41.1	60.0	31.7	50.6	45.1	40.1	36.0
11:00 PM	39.2	59.3	31.6	47.1	42.7	37.8	35.2
Daytime	46.4	77.9	30.0	55.7	48.2	43.9	40.7
Nighttime	44.0	69.1	29.0	53.5	48.5	42.5	37.9


Location-2, 24 Hour Noise Monitoring Results (Leq, Ln)
80.0
60.0
40.0
20.0
0.0
Decibel (dB)
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Time
Leq
Lmax
Lmin
L2
L8
L25
L50


Location-2, 24-Hour Noise Monitoring Result (CNEL)
Noise Level (dBA)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
Leq
CNEL

Appendix C

Noise Analysis Results
(SoundPLAN Results Sheets)

Contribution levels of the receivers

Source name		Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
		dB(A)		dB(A)	
1	GF	40.5	39.6	41.3	40.8
HVAC - Building A		35.0	35.0	-	-
HVAC - Building B		22.8	22.8	-	-
Parking Lot		38.6	37.6	-	-
Patio with music		27.1	-	-	-
2	GF	38.9	38.1	38.7	38.1
HVAC - Building A		34.9	34.9	-	-
HVAC - Building B		19.3	19.3	-	-
Parking Lot		36.3	35.2	-	-
Patio with music		25.1	-	-	-
3	GF	43.1	42.6	43.9	43.7
HVAC - Building A		21.9	21.9	-	-
HVAC - Building B		40.5	40.5	-	-
Parking Lot		39.5	38.4	-	-
Patio with music		22.7	-	-	-
4	GF	47.3	46.9	48.5	48.3
HVAC - Building A		24.7	24.7	-	-
HVAC - Building B		44.7	44.7	-	-
Parking Lot		43.9	42.8	-	-
Patio with music		25.4	-	-	-
5	GF	37.8	36.9	38.9	38.6
HVAC - Building A		33.9	33.9	-	-
HVAC - Building B		21.1	21.1	-	-
Parking Lot		34.7	33.6	-	-
Patio with music		27.2	-	-	-
6	GF	39.3	38.5	39.4	39.1
HVAC - Building A		35.0	35.0	-	-
HVAC - Building B		24.5	24.5	-	-
Parking Lot		36.7	35.6	-	-
Patio with music		27.2	-	-	-
7	GF	41.4	40.7	39.7	39.2
HVAC - Building A		20.7	20.7	-	-
HVAC - Building B		37.5	37.5	-	-
Parking Lot		39.0	37.9	-	-
Patio with music		21.8	-	-	-

Contribution levels of the receivers

Source name		Level w/o NP Day	Level w/o NP Night	Level w NP Day	Level w NP Night
		dB(A)		dB(A)	
1	GF	39.3	38.0	41.3	40.8
HVAC - Building A		27.5	27.5	-	-
HVAC - Building B		15.3	15.3	-	-
Parking Lot		38.6	37.6	-	-
Patio with music		27.1	-	-	-
2	GF	37.1	35.9	38.7	38.1
HVAC - Building A		27.4	27.4	-	-
HVAC - Building B		11.8	11.8	-	-
Parking Lot		36.3	35.2	-	-
Patio with music		25.1	-	-	-
3	GF	40.5	39.5	43.9	43.7
HVAC - Building A		14.4	14.4	-	-
HVAC - Building B		33.0	33.0	-	-
Parking Lot		39.5	38.4	-	-
Patio with music		22.7	-	-	-
4	GF	44.8	43.8	48.5	48.3
HVAC - Building A		17.2	17.2	-	-
HVAC - Building B		37.2	37.2	-	-
Parking Lot		43.9	42.8	-	-
Patio with music		25.4	-	-	-
5	GF	36.0	34.4	38.9	38.6
HVAC - Building A		26.4	26.4	-	-
HVAC - Building B		13.6	13.6	-	-
Parking Lot		34.7	33.6	-	-
Patio with music		27.2	-	-	-
6	GF	37.6	36.3	39.4	39.1
HVAC - Building A		27.5	27.5	-	-
HVAC - Building B		17.0	17.0	-	-
Parking Lot		36.7	35.6	-	-
Patio with music		27.2	-	-	-
7	GF	39.6	38.6	39.7	39.2
HVAC - Building A		13.2	13.2	-	-
HVAC - Building B		30.0	30.0	-	-
Parking Lot		39.0	37.9	-	-
Patio with music		21.8	-	-	-

Appendix D

Construction and Vibration Analysis Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/21/2022
Case Description: Haven Winery Noise Impact Study

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Preparations	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0

Results

Equipment		Calculated (dBA) *Lmax	Leq
Grader		85	81
Dozer		81.7	77.7
Tractor		84	80
	Total	85	84.6

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/21/2022
Case Description: Haven Winery Noise Impact Study

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Grading	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

Results

Equipment		Calculated (dBA) *Lmax	Leq
Grader		85	81
Dozer		81.7	77.7
Tractor		84	80
Tractor		84	80
	Total	85	85.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/21/2022
Case Description: Haven Winery Noise Impact Study

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Building Construction	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
Pickup Truck	No	40		75	50	0
Generator	No	50		80.6	50	0
Tractor	No	40	84		50	0
Welder / Torch	No	40		74	50	0
Welder / Torch	No	40		74	50	0
Welder / Torch	No	40		74	50	0

Results

Equipment		Calculated (dBA) *Lmax	Leq
Crane		80.6	72.6
Pickup Truck		75	71
Generator		80.6	77.6
Tractor		84	80
Welder / Torch		74	70
Welder / Torch		74	70
Welder / Torch		74	70
	Total	84	83.4

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/21/2022
Case Description: Haven Winery Noise Impact Study

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Paving	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	50	0
Paver	No	50		77.2	50	0
Roller	No	20		80	50	0
Roller	No	20		80	50	0
Tractor	No	40	84		50	0
Concrete Mixer Truck	No	40		78.8	50	0
Concrete Mixer Truck	No	40		78.8	50	0
Concrete Mixer Truck	No	40		78.8	50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Concrete Mixer Truck		78.8	74.8
Paver		77.2	74.2
Roller		80	73
Roller		80	73
Tractor		84	80
Concrete Mixer Truck		78.8	74.8
Concrete Mixer Truck		78.8	74.8
Concrete Mixer Truck		78.8	74.8
	Total	84	84.6

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/21/2022
Case Description: Haven Winery Noise Impact Study

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Architectural Coating	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0

Results

		Calculated (dBA)	
Equipment		*Lmax	Leq
Compressor (air)		77.7	73.7
	Total	77.7	73.7

*Calculated Lmax is the Loudest value.

PROJECT:	Haven Winery	JOB #:	3035-2022-02
ACTIVITY:	Construction Vibration	DATE:	2-Dec-2022
LOCATION:	Receptors at 100 Feet	ENGINEER:	B. Morrison

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.019**	**in/sec**

Equipment Type =	2	Large Bulldozer
PPV_{ref} =	0.089	Reference PPV at 25 ft.
D =	100.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

PROJECT:	Haven Winery	JOB #:	3035-2022-02
ACTIVITY:	Construction Vibration	DATE:	2-Dec-2022
LOCATION:	Receptors at 100 Feet	ENGINEER:	B. Morrison

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.046**	**in/sec**

Equipment Type =	1	Vibratory Roller
PPV_{ref} =	0.210	Reference PPV at 25 ft.
D =	100.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400

PROJECT:	Haven Winery	JOB #:	3035-2022-02
ACTIVITY:	Construction Vibration	DATE:	2-Dec-2022
LOCATION:	Receptors at 100 Feet	ENGINEER:	B. Morrison

VIBRATION INPUT/OUTPUT DATA

OTHER CONSTRUCTION EQUIPMENT

$$PPV = PPV_{ref}(25/D)^{n} \text{ (in/sec)}$$

PPV =	**0.017**	**in/sec**

Equipment Type =	4	Loaded Trucks
PPV_{ref} =	0.076	Reference PPV at 25 ft.
D =	100.00	Distance from Equipment to receiver in ft.
n =	1.10	Vibration attenuation rate through the ground

EQUIPMENT PPV REFERENCE LEVELS

Type	Equipment	Reference PPV
1	Vibratory Roller	0.210
2	Large Bulldozer	0.089
3	Caisson Drilling	0.089
4	Loaded Trucks	0.076
5	Jackhammer	0.035
6	Small Bulldozer	0.003
7	Crack and Seat	2.400