# NOISE & GROUNDBORNE VIBRATION IMPACT ANALYSIS

FOR

# BUENA VISTA VINEYARDS DEVELOPMENT PROJECT

## PASO ROBLES, CA

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## LIST OF COMMON TERMS AND ACRONYMS

| | |
|---|---|
| ANSI | Acoustical National Standards Institute, Inc. |
| Caltrans | California Department of Transportation |
| CEQA | California Environmental Quality Act |
| CNEL | Community Noise Equivalent Level |
| dB | Decibels |
| dBA | A-Weighted Decibels |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| HVAC | Heating Ventilation & Air Conditioning |
| Hz | Hertz |
| in/sec | Inches per Second |
| $L_{dn}$ | Day-Night Level |
| $L_{eq}$ | Equivalent Sound Level |
| $L_{max}$ | Maximum Sound Level |
| ppv | Peak Particle Velocity |
| Project | Buena Vista Vineyards Development Project |
| U.S. EPA | United States Environmental Protection Agency |

# INTRODUCTION

This report discusses the existing noise setting and identifies potential noise impacts associated with the implementation of the proposed Buena Vista Vineyards Development Project (project). Noise mitigation measures are recommended where the predicted noise levels would exceed applicable noise standards.

## PROPOSED PROJECT SUMMARY

The Buena Vista Vineyards Development project proposes a boutique hotel located in the middle of a wine-producing vineyard. In addition to the hotel, the proposed development would feature, cottages with mineral springs lagoons, glamping facilities, hot mineral spas, two independent wine-tasting rooms, a restaurant, a wedding pavilion, and conference facilities. The proposed project is located in the City of Paso Robles, California. The total estimated square footage for the project is 150,430 and includes the introduction of 200 new units.

# EXISTING SETTING

## CONCEPTS AND TERMINOLOGY

### ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency.

#### *Amplitude*

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

#### *Frequency*

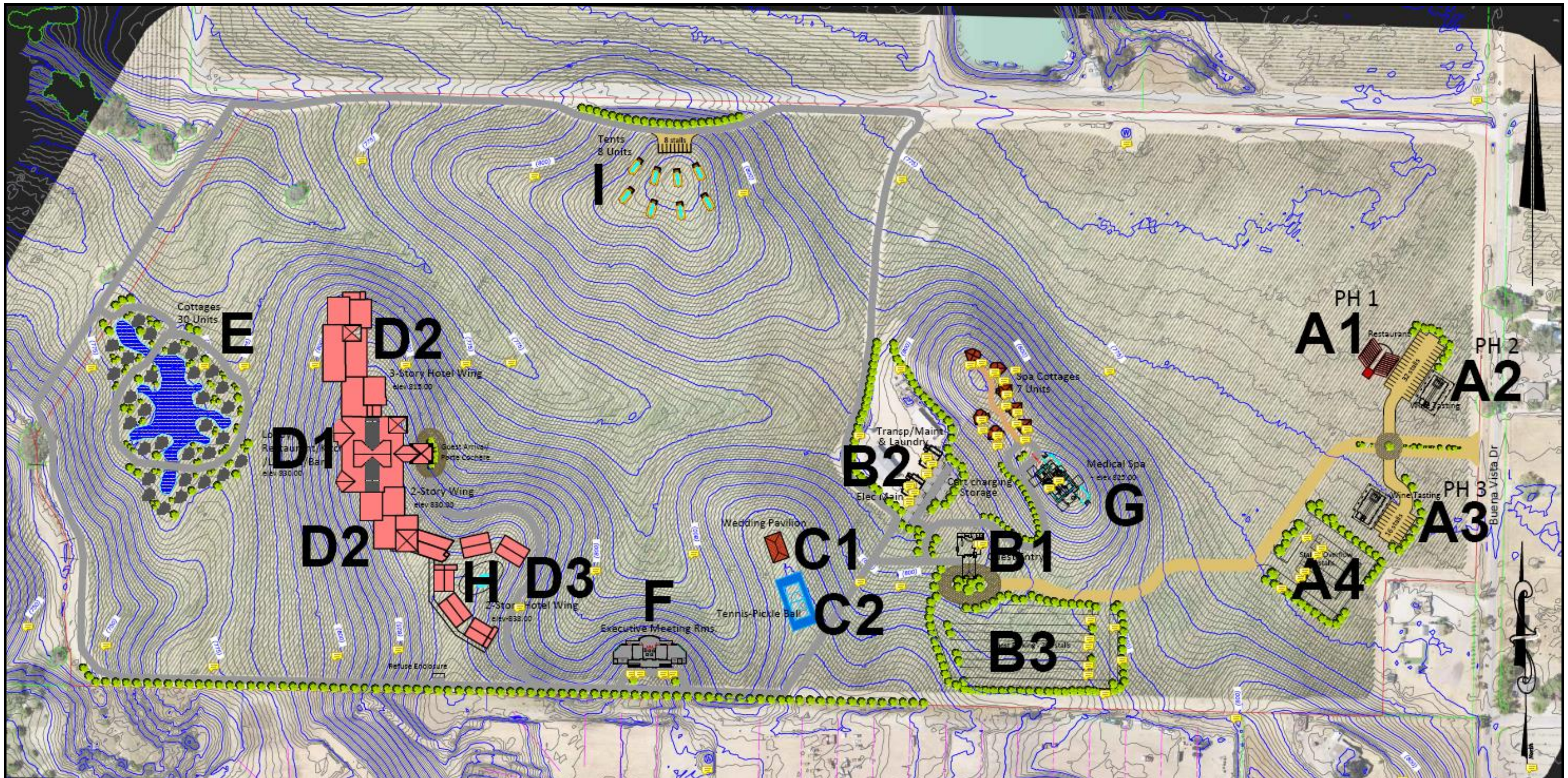
The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower, and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (U.S. EPA 1971). Common community noise sources and associated noise levels, in dBA, are depicted in Figure 3.

##### *Addition of Decibels*

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

**Figure 1**
**Project Vicinity Map**

**Figure 2**
**Project Site Plan**




| | | | |
|---|---|---|---|
| A1 - Restaurant | B1 - Guest Entry | C1 - Wedding Pavilion | E - Cottages (30 Units) |
| A2 - Wine tasting #1 (32 stalls) | B2 - EV-Cart Charging | C2 - Tented Sports Court | F - Executive Meeting Rms. |
| A3 - Wine Tasting #2 (16 stalls) | B3 - Guest/Valet Parking (203 stalls) | D1 - Boutique Hotel Lobby | G - Med/Spa & Spa Cottages (7 units) |
| A4 - Staff Parking (75 stalls) | | D2 - Rooms Wings (137 units) | H - Pool Area & Amenities |
| | | D3 - Lanai Pool Rms (18 units) | I - Tents (8 units) (8 stalls) |

Total Units - 200
Total on-site Parking - 334 stalls

Buena Vina Development Key Plan
Buena Vista Dr, Paso Robles, CA
APN 025-390-011 / APN 025-390-038
Scale 1"=100' Feb. 21, 2024

### *Sound Propagation & Attenuation*

*Geometric Spreading*

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

*Atmospheric Effects*

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

*Shielding by Natural or Human-Made Features*

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

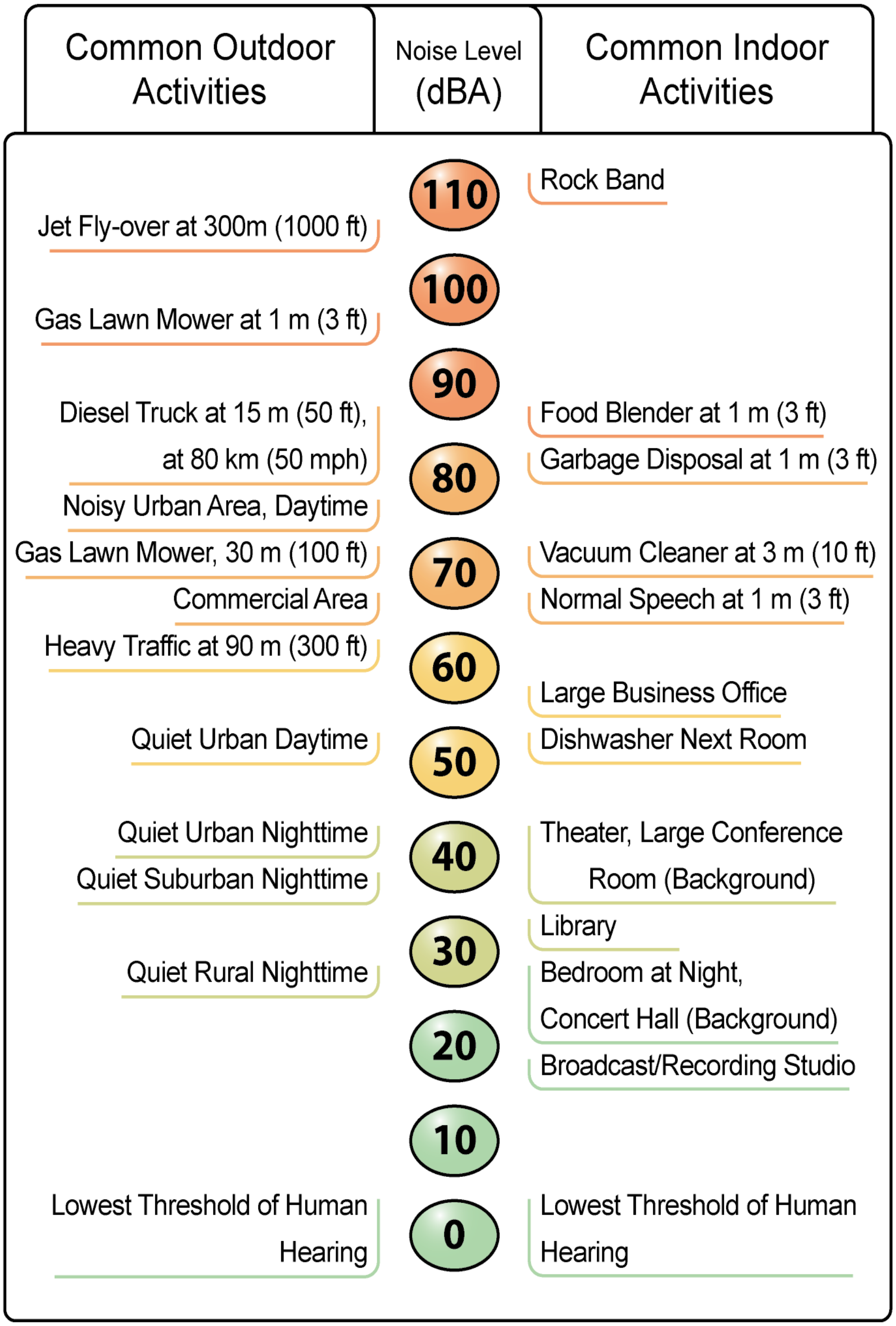
Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dBA exterior-to-interior noise reductions for building facades, with windows open, and approximately 25-30 dBA, with windows closed. With compliance with current Title 24 energy efficiency standards, which require increased building insulation and inclusion of an interior air ventilation system to allow windows on noise-impacted façades to remain closed, exterior-to-interior noise reductions typically average approximately 25 dBA. The absorptive characteristics of interior rooms, such as carpeted floors, draperies, and furniture, can result in further reductions in interior noise.

## NOISE DESCRIPTORS

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

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower

**Figure 3**
**Common Community Noise Sources & Noise Levels**




*Source: Caltrans 2022*

frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise.

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

**Table 1**
**Common Acoustical Descriptors**

| Descriptor | Definition |
|---|---|
| Energy Equivalent Noise Level ($L_{eq}$) | The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated. |
| Statistical Descriptor ($L_x$) | The noise level exceeded a percentage of time during a measurement period. For instance, $L_{50}$ is a statistical descriptor of the noise level exceeded 50% of the time during the measurement period. Over a one-hour period the $L_{50}$ noise level is roughly equivalent to the $L_{eq}$ noise level. |
| Minimum Noise Level ($L_{min}$) | The minimum instantaneous noise level during a specific period of time. |
| Maximum Noise Level ($L_{max}$) | The maximum instantaneous noise level during a specific period of time. |
| Day-Night Average Noise Level (DNL or $L_{dn}$) | The DNL was first recommended by the U.S. EPA in 1974 as a "simple, uniform and appropriate way" of measuring long term environmental noise. DNL takes into account both the frequency of occurrence and duration of all noise events during a 24-hour period with a 10 dBA "penalty" for noise events that occur between the more noise-sensitive hours of 10 p.m. and 7 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours. |
| Community Noise Equivalent Level (CNEL) | The CNEL is similar to the Ldn described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated Ldn. |

### HUMAN RESPONSE TO NOISE

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

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

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

### ***Effects of Noise on Human Activities***

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

#### *Speech Communication*

For most noise-sensitive land uses, an interior noise level of 45 dBA $L_{eq}$ is typically identified for the protection of speech communication in order to provide for 100-percent intelligibility of speech sounds. For outdoor voice communication, an exterior noise level of 60 dBA $L_{eq}$ allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (U.S. EPA 1974.) Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA. Within interior noise environments, an average-hourly background noise level of 45 dBA $L_{eq}$ is typically recommended for noise-sensitive land uses, such as educational facilities (Caltrans 2002).

#### *Annoyance & Sleep Disruption*

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or $L_{dn}$). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978 the research findings of Theodore J. Schultz provided support for $L_{dn}$ as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA $L_{dn}$. It also indicates that the percentage of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA $L_{dn}$. A noise level of 65 dBA $L_{dn}$ is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed (Caltrans 2002).

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and state of California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/$L_{dn}$ as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA $L_{dn}$ as the dividing point between normally compatible and normally incompatible residential land use generally applied for determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/$L_{dn}$ are typically considered to result in a potentially significant increase in levels of annoyance (Caltrans 2002).

Allowing for an average exterior-to-interior noise reduction of 25 dBA, which is typical for newer building construction with windows closed, an exterior noise level of 70 dBA CNEL/$L_{dn}$ would equate to an interior noise level of 45 dBA CNEL/$L_{dn}$. An interior noise level of 45 dBA CNEL/$L_{dn}$ is generally considered sufficient to protect against activity interference at most noise-sensitive land uses, including residential dwellings, and would also be sufficient to protect against sleep interference (U.S. EPA 1974.) Within California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single-family dwellings). Use of the 45 dBA CNEL threshold is further supported by recommendations provided in the State of California Office of Planning and Research's *General Plan Guidelines*, which recommend an interior noise level of 45 dBA CNEL/$L_{dn}$ as the maximum allowable interior noise level sufficient to permit "normal residential activity."

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train passbys, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of other noise metrics, such as the $L_{eq}$ or $L_{max}$ descriptor, may be helpful as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact (Caltrans 2002).

## AFFECTED ENVIRONMENT

### NOISE-SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

Existing sensitive land uses located in the vicinity of the proposed project site consist of rural residential land uses. The nearest residential land uses are located approximately 95 feet east of the project boundary.

### AMBIENT NOISE ENVIRONMENT

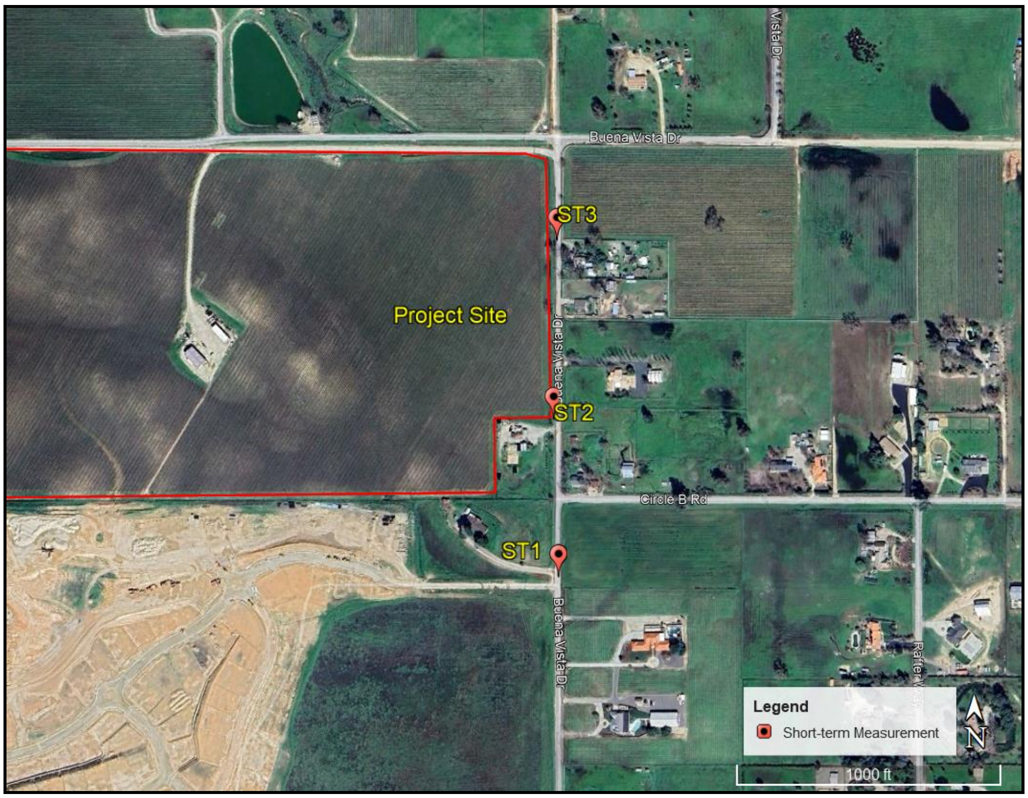
To document existing ambient noise levels in the project area, short-term ambient noise measurements were conducted on February 23rd, 2024, using a Soft dB Piccolo Type 2 integrating sound-level meter. The meter was calibrated before use and is certified to be in compliance with Acoustical National Standards Institute (ANSI) specifications. Measured short-term ambient noise levels are summarized in Table 2. Noise measurement locations are presented in Figure 4.

As indicated in Table 2, the measured daytime ambient noise levels in the project area average approximately 59 to 63 dBA $L_{eq}$. Ambient noise levels within the project area are predominantly influenced by vehicle traffic on Buena Vista Drive. Ambient noise levels during the evening and nighttime hours are generally 5 to 10 dB lower than daytime noise levels.

**Table 2**
**Summary of Short-Term Measured Ambient Noise Levels**

| Measurement Location | Monitoring Period | Primary Noise Sources Noted | Noise Levels (dBA $L_{eq}$) |
|---|---|---|---|
| ST1: Buena Vista Dr. south of Circle B Rd. | 10:43 – 10:53 | Light-duty auto traffic on Buena Vista Dr. | 62.7 |
| ST2: Buena Vista Dr. north of Circle B Rd. | 10:57 – 11:07 | Light-duty auto traffic on Buena Vista Dr., dogs barking, and birds chirping | 59.4 |
| ST3: Buena Vista Dr. north of short-term measurement 2 (ST 2) | 11:20 – 11:30 | Light duty auto traffic on Buena Vista Dr., roosters, various birds | 59.7 |
| *Ambient noise measurements were conducted on February 23, 2023, using a Soft dB Piccolo Type 2 integrating sound-level meter. Refer to Figure 3 for noise measurement locations.* | | | |

**Figure 4**
**Short-term Measurement Locations**




## REGULATORY FRAMEWORK

NOISE

### *City of Paso Robles General Plan*

The *City of Paso Robles General Plan Noise Element* was adopted in 2019. The General Plan Noise Element includes noise standards for the determination of compatibility of newly proposed land uses in comparison to existing noise environments. Because the proposed project is a new land use it must satisfy the City's land use compatibility standards. The City's General Plan identifies quantitative noise standards for both transportation and non-transportation (i.e., stationary) noise sources. The City's General Plan noise standards for non-transportation noise sources are consistent with those identified in the City's municipal code, as discussed below. With regard to transportation noise, the City's General Plan noise standard for new hotels is 65 dBA $L_{dn}$/CNEL for outdoor activity areas and 45 dBA $L_{dn}$/CNEL for interior spaces (refer to Table 3) (Paso Robles 2019).

**Table 3**
**Noise Standards for New Uses Affected by Traffic or Railroad Noise**

| Land Use | Noise Sensitive[1] Outdoor Areas - $L_{dn}$[7] | Noise Sensitive Interior Spaces[2,3] | |
|---|---|---|---|
| | | $L_{dn}$[7] | $L_{eq}$[5,8] |
| Residential | 65 | 45 | -- |
| Mixed Use Residential | -- | 45 | -- |
| Uptown Town Center S.P. Area Residential | 70 | 45 | -- |
| Hotels, Hospitals[4], & Nursing Homes | 65 | 45 | -- |
| Theaters & Auditoriums | -- | -- | 35 |
| Churches, Meeting Halls, Libraries | 65 | -- | 40 |
| Schools[6] | -- | -- | 40 |
| Office/Professional | 65 | -- | 45 |
| Commercial/Retail Buildings | -- | -- | 50 |
| Playgrounds, Parks, etc. | 70 | -- | -- |
| Industrial | -- | -- | 50 |

1. *Noise sensitive areas are defined in the acoustic terminology section. Where there are no sensitive exterior spaces proposed as part of the new use, only the interior noise level standards shall apply.*
2. *Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.*
3. *If the proposed use is exposed to railroad noise, in addition to the interior noise standards shown, a maximum (Lmax) noise level standard of 70 dBA shall be applied to all sleeping rooms to reduce the potential for sleep disturbance during nighttime train passages.*
4. *Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.*
5. *As determined for a typical worst-case hour during periods of use.*
6. *Exterior areas of school uses are not typically noise-sensitive. As a result, the standards for schools are focused on the interior office and classroom spaces.*
7. *DNL = Day – Night Average Level (also denoted Ldn). Represents 24-hour average of noise with noise occurring during nighttime hours (10 pm to 7 am) penalized by 10 dBA prior to averaging.*
8. *Leq = Average or "Equivalent" noise level. Represents the energy average of all noise occurring during a given period (typically 1-hour).*

### *City of Paso Robles Municipal Code*

The City of Paso Robles Municipal Code, Title 21 – Zoning, Chapter 21.60.040 – General Noise Regulations, addresses noise associated with public nuisances. The City's municipal code identifies quantitative noise standards to be applied to interior and exterior noise levels. The noise standards vary by the time of day. As presented in Table 4, the exterior standards for hotels range from 70 to 75 dBA $L_{max}$ for instantaneous noise levels and 50 to 60 dBA $L_{eq}$ for average hourly noise levels, depending on the time of day. Likewise, interior noise standards for hotels range from 45 to 60 dBA $L_{max}$ and 35 to 45 dBA $L_{eq}$. Noise sources exempt from the provisions of this chapter include but are not limited to(City of Paso Robles 2023):

- Construction and demolition activities located within one thousand feet of noise-sensitive land uses provided they occur during normal daytime hours, excluding Sundays and federal holidays, subject to the conditions imposed by city permit. For construction activities, daytime hours are defined as seven a.m. to seven p.m. Construction activities occurring between the hours of seven p.m. and seven a.m. must comply with the interior noise level standards identified in Table 1 unless an exception has been granted by the city planning department. An exception for concrete pours or other construction activities requiring an early morning start time may be authorized by the community development director.

- Construction and demolition activities located beyond one thousand feet of noise-sensitive land uses, subject to the conditions imposed by city permit. For construction activities, daytime hours are defined as seven a.m. to seven p.m.

- When an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work outside of the hours delineated above and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.

**Table 4**
**Noise Standards for Non-Transportation Noise Sources**

| Receiving Land Use | Period[3] | Exterior Spaces[1] | | Interior Spaces[2] | |
|---|---|---|---|---|---|
| | | $L_{max}$[4] | $L_{eq}$[5] | $L_{max}$[4] | $L_{eq}$[5] |
| Residential | Day | 75 | 55 | 60 | 45 |
| | Evening | 70 | 50 | 55 | 40 |
| | Night | 65 | 45 | 45 | 35 |
| Mixed Use Residential | Day | -- | -- | 60 | 45 |
| | Evening | -- | -- | 55 | 40 |
| | Night | -- | -- | 45 | 35 |
| Uptown Town Center S.P. Area Residential | Day | 80 | 60 | 60 | 45 |
| | Evening | 75 | 55 | 55 | 40 |
| | Night | 70 | 50 | 45 | 35 |
| Hotels, Hospitals[6], & Nursing Homes | Day | 75 | 60 | 60 | 45 |
| | Evening | 75 | 55 | 55 | 40 |
| | Night | 70 | 50 | 45 | 35 |
| Theaters & Auditoriums | Day | 75 | 55 | 40 | 35 |
| | Evening | 70 | 50 | 40 | 35 |
| | Night | -- | -- | 40 | 35 |
| Churches, Meeting Halls, Libraries | Day | 75 | 55 | 55 | 45 |
| | Evening | 70 | 50 | 55 | 40 |
| Schools[7] | Day | -- | -- | 55 | 40 |
| | Evening | -- | -- | 55 | 40 |
| Office/Professional | Day | 80 | 60 | 60 | 45 |
| | Evening | 75 | 55 | 60 | 45 |
| Commercial/Retail Buildings | Day | 80 | 60 | 60 | 50 |
| | Evening | 75 | 55 | 60 | 50 |
| Playgrounds, Parks, etc. | Day | 75 | 55 | -- | -- |
| | Evening | 75 | 55 | -- | -- |
| Industrial | Day | 80 | 60 | 60 | 50 |
| | Evening | 75 | 55 | 60 | 50 |

1. *Noise sensitive areas are defined acoustic terminology section.*
2. *Interior noise level standards are applied within noise-sensitive areas of the various land uses, as defined in the acoustic terminology section, with windows and doors closed.*
3. *Daytime hours = 7 a.m. to 7 p.m., Evening hours = 7 p.m. to 10 p.m., Nighttime hours = 10 p.m. to 7 a.m.*
4. *$L_{max}$ = Highest measured sound level occurring during a given interval of time (Typically 1 hour).*
5. *$L_{eq}$ = Average or "Equivalent" noise level during the worst-case hour in which the building is in use.*
6. *Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.*
7. *Exterior areas of school uses are not typically noise-sensitive. As a result, the standards for schools are focused on the interior office and classroom spaces.*

*General Notes:*

a. *Where the noise source in question consists of speech or music, or is impulsive in nature, or contains a pure tone, the noise standards of this table are reduced by 5 dB.*
b. *Where ambient noise levels exceed the noise level standards shown above, the noise standards shall be increased in 5 dBA increments to encompass the ambient.*
c. *Reductions in the noise standards for noise sources identified in general note "A" above shall be applied after any increases warranted by elevated ambient conditions prescribed in general note "B," subject to verification through a noise study.*

GROUNDBORNE VIBRATION

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

The effects of groundborne vibration levels, with regard to human annoyance and structural damage, are influenced by various factors, including ground type, the distance between source and receptor, and duration. Overall effects are also influenced by the type of vibration event, defined as either continuous or transient. Continuous vibration events would include most construction equipment, including pile drivers, and compactors, whereas, transient sources of vibration create single isolated vibration events, such as demolition ball drops and blasting.

The threshold criteria for continuous and transient events are summarized in Table 5. As indicated in Table 5, the threshold at which there is a risk to normal structures from continuous events is 0.5 inches per second (in/sec) peak particle velocity (ppv) for newer building construction. A threshold of 0.5 in/sec ppv also represents the structural damage threshold applied to older structures for transient vibration sources. With regard to human perception (refer to Table 5), vibration levels would begin to become distinctly perceptible at levels of 0.04 in/sec ppv for continuous events and 0.25 in/sec ppv for transient events. Continuous vibration levels are considered annoying for people in buildings at levels of 0.2 in/sec ppv (Caltrans 2020).

**Table 5**
**Summary of Groundborne Vibration Levels and Potential Effects**

| Vibration Level (in/sec ppv) | Human Reaction | Effect on Buildings |
|---|---|---|
| 0.006 - 0.019 | Threshold of perception; possibility of intrusion. | Vibrations unlikely to cause damage of any type. |
| 0.08 | Vibrations readily perceptible. | Recommended upper level of the vibration to which ruins and ancient monuments should be subjected. |
| 0.10 | Level at which continuous vibrations begin to annoy people. | Virtually no risk of "architectural" damage to normal buildings. |
| 0.20 | Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relatively short periods of vibrations). | Threshold at which there is a risk of "architectural" damage to fragile buildings. |
| 0.3 - 0.6 | Vibrations become distinctly perceptible at 0.04 in/sec ppv and considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges. | Potential risk of "architectural" damage may occur at levels above 0.3 in/sec ppv for older residential structures and above 0.5 in/sec ppv for newer structures. |

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

## IMPACTS AND MITIGATION MEASURES

### METHODOLOGY

#### Short-Term Construction Noise

Short-term noise impacts associated with construction activities were analyzed based on typical construction equipment noise levels and distances to the nearest noise-sensitive land uses. Noise levels were predicted based on representative off-road equipment noise levels derived from the Federal

Highway Administration's (FHWA) Roadway Construction Noise Model based on average equipment usage rates and assuming a noise-attenuation rate of 6 dB per doubling of distance from the source.

**Long-term Operational Noise**

The primary operational noise source for the project would be associated with activities at the wedding pavilion, building mechanical equipment, and vehicle parking areas. Noise levels were predicted based on representative noise levels, average equipment usage rates, shielding provided by intervening terrain, and assuming a noise-attenuation rate of 6 dB per doubling of distance from the source.

Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project (CCTC 2023). The project's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic for both existing and cumulative conditions. The compatibility of the proposed land use was evaluated based on future cumulative traffic conditions derived from the traffic analysis prepared for this project (CCTC 2023). Predicted traffic noise levels are included in Appendix A.

## THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the California Environmental Quality Act (CEQA) Guidelines Initial Study Checklist, a project would be considered to have a significant impact on climate change if it would:

a) Result in the 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.

b) Generate 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, the project would expose people residing or working in the project area to excessive noise levels.

The CEQA Guidelines do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." As discussed previously in this section, a noise level increase of 3 dBA is barely perceptible to most people, an increase of 5 dBA is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. As per the Paso Robles Noise Element, an increase of 3 dBA is seen as significant in areas with pre-project noise environments between 60-65 dBA. For purposes of this analysis, a significant increase in ambient noise levels would be defined as an increase of 3 dBA, or greater, that would exceed applicable noise standards.

Stationary source noise levels were evaluated in comparison to the City's noise ordinance standards (refer to Table 4). The compatibility of proposed land uses was also evaluated for consistency with the City's General Plan noise standards and policies, which establish a conditionally acceptable exterior noise level for hotel land uses of 60 dBA $L_{dn}$ at outdoor activity areas and an interior noise level of 45 dBA $L_{dn}$.

It is important to note that no standardized criteria have been developed by the State of California or the City for assessing construction noise impacts. However, the Federal Transit Administration (FTA) has identified criteria for the assessment of construction-generated noise levels. For noise-sensitive land uses, such as residential land uses, the FTA criteria identify daytime and nighttime average-hourly noise limits of 90 and 80 dBA $L_{eq}$, respectively (FTA 2018). Short-term construction noise levels exceeding these levels would be determined to have a potentially significant impact.

The CEQA Guidelines also do not define the levels at which groundborne vibration levels would be considered excessive. For this reason, the California Department of Transportation (Caltrans) recommended groundborne vibration thresholds were used for the evaluation of impacts based on increased potential for structural damage and human annoyance, as identified in Table 5. No fragile or historic buildings were identified in the project area. For purposes of this analysis, risks of architectural damage (i.e., minor cracking of plaster walls and ceilings) would be considered potentially significant if construction-generated ground vibration levels at nearby structures would exceed 0.5 in/sec ppv. Ground vibration in excess of 0.2 in/sec ppv would be expected to result in a potential for significant short-term increases in levels of annoyance for occupants of nearby sensitive structures (e.g., residential dwellings).

## PROJECT IMPACTS

| | |
|---|---|
| ***Impact Noise-A:*** | ***Would the project result in the 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?*** |

Potential short-term and long-term noise impacts associated with the proposed project are discussed, as follows:

### Short-term Construction Noise Impacts

Construction noise typically occurs intermittently and varies depending upon the phase (e.g., land clearing, grading, excavation, and erection). Noise generated by construction equipment, including earthmovers, material handlers, and portable generators can reach high levels. Noise levels commonly associated with off-road equipment anticipated to be used during project construction are summarized in Table 6.

As noted in Table 6, instantaneous noise levels generated by individual pieces of off-road equipment typically range from approximately 77 to 90 dBA $L_{max}$ at 50 feet. Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Based on typical off-road equipment usage rates, average hourly noise levels for individual equipment would be approximately 83 dBA $L_{eq}$, or less, at 50 feet. Assuming that multiple pieces of equipment could be operating simultaneously, predicted average-hourly noise levels could reach levels of approximately 85 dBA at 50 feet.

**Table 6**
**Typical Construction Equipment Noise Levels**

| Equipment | Typical Noise Level (dBA) at 50 Feet from Source | |
|---|---|---|
| | $L_{max}$ | $L_{eq}$ |
| Air Compressor | 78 | 74 |
| Backhoe | 78 | 74 |
| Concrete Mixer | 79 | 75 |
| Crane, Mobile | 81 | 73 |
| Dozer | 82 | 78 |
| Grader | 85 | 81 |
| Loader | 79 | 71 |
| Paver | 77 | 74 |
| Roller | 80 | 73 |
| Saw | 90 | 83 |

dBA = A-weighted decibels; $L_{max}$ = Maximum sound level; $L_{eq}$ = Equivalent sound level

Source: FHWA Roadway Construction Noise Model

The nearest noise-sensitive land uses located in the vicinity of the proposed project site are rural residential dwellings, which are located approximately 95 feet east of the project boundary. Depending on the location and types of onsite activities conducted, predicted noise levels at the nearest existing residences could reach up to 79 dBA $L_{eq}$ assuming the two loudest pieces of equipment operating simultaneously. Noise levels at this nearest residence would not exceed the significance threshold of 80 dBA $L_{eq}$. With regard to residential land uses, noise levels associated with construction activities occurring during the more noise-sensitive evening and nighttime hours are also of increased concern. Because exterior ambient noise levels typically decrease during the evening and nighttime hours, as community activities (e.g., commercial activities, vehicle traffic) decrease, construction activities performed during these more noise-sensitive periods of the day may result in increased annoyance and potential sleep disruption for occupants of nearby residential dwellings. For this reason, this impact would be considered **potentially significant.**

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

a. Noise sources associated with construction shall be limited to between 7 a.m. and 7 p.m. on weekdays. Construction activities shall be prohibited on Sundays and federal holidays.

b. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

c. When not in use, off-road equipment shall be turned off and shall not be allowed to idle.

**Significance After Mitigation:** The use of mufflers would reduce individual equipment noise levels by approximately 10 dBA. Implementation of the above mitigation measures would limit construction activities to the less noise-sensitive periods of the day. With the implementation of the above mitigation measures and because activities would be short-term, this impact would be considered ***less-than-significant.***

**<u>Long-term Operational Noise Impacts</u>**

**On-Site Stationary Noise Sources**

On-site stationary source noise levels would be primarily influenced by activities at the wedding pavilion, building mechanical equipment, and on-site vehicle parking areas. Noise levels and potential impacts on nearby existing land uses are discussed, as follows:

**Wedding Pavilion**

Noise associated with the wedding pavilion could expose other nearby land uses (both existing and project-related) to increases in ambient noise levels. Operational noise levels associated with on-site wedding events were calculated based on a measured operational noise level of 70 dBA $L_{eq}$ at 50 feet obtained from a similar wedding venue. This representative noise level includes the use of an amplified sound system consisting of a mix of music and announcements conducted over an approximate one-hour period.

<u>Proposed Onsite Receptors</u>

The proposed wedding pavilion would be located roughly 630 feet from the nearest proposed noise-sensitive outdoor activity area. Based on this distance and assuming a maximum noise level of 70 dBA $L_{eq}$ at 50 feet, predicted exterior operational noise levels at the nearest proposed outdoor activity areas would be 43 dBA $L_{eq}$. Predicted exterior noise levels would not exceed the City's exterior noise standards for non-transportation noise sources of 55 dBA $L_{eq}$ during the daytime hours or 45 dBA $L_{eq}$ during nighttime hours.

The nearest proposed interior area would be located roughly 550 feet from the proposed wedding pavilion. Based on this distance and assuming a maximum noise level of 70 dBA $L_{eq}$ at 50 feet, and an exterior-to-interior noise reduction of 25 dBA, predicted interior operational noise levels at the nearest proposed interior area would be 19 dBA $L_{eq}$. Predicted interior noise levels would not exceed the City's interior noise standards for non-transportation noise sources of 45 dBA $L_{eq}$ during the daytime hours or 35 dBA $L_{eq}$ during nighttime hours (refer to Table 4).

Existing Offsite Receptors

The proposed wedding pavilion would be located roughly 1000 feet from the nearest existing residential dwelling. Based on this distance and assuming a maximum noise level of 70 dBA $L_{eq}$ at 50 feet, predicted exterior operational noise levels at the nearest residential land use would be 44 dBA $L_{eq}$. Predicted exterior noise levels would not exceed the City's exterior noise standards for non-transportation noise sources of 55 dBA $L_{eq}$ during the daytime hours and 45 dBA $L_{eq}$ during nighttime hours.

Based on this noise level and assuming an exterior-to-interior noise reduction of 25 dBA, predicted interior operational noise levels at the nearest residential land use would be 19 dBA $L_{eq}$. Predicted interior noise levels would not exceed the City's interior noise standards for non-transportation noise sources of 45 dBA $L_{eq}$ during the daytime hours and 35 dBA $L_{eq}$ during nighttime hours (refer to Table 4).

Predicted noise levels at both proposed and existing outdoor activity areas and interior areas would not exceed the City's standards for non-transportation noise sources(refer to Table 4). As a result, this impact would be ***less than significant***.

**Building Mechanical Equipment**

Noise generated by building mechanical equipment (e.g., heaters, and air conditioning units) can result in increases in ambient noise levels. Building heating units are typically located within the structure and would not be expected to result in detectable increases in exterior ambient noise levels. Air conditioning units would operate primarily during the day and evening hours and less frequently at night. Air conditioning units typically generate noise levels of approximately 60 to 65 dBA $L_{eq}$ at 3 feet when operating. Typical operational cycles for residential units occur for periods of approximately 10 minutes in 20-to-30-minute intervals. The nearest existing noise-sensitive land use (i.e., residential dwelling) is located approximately 150 feet east of the proposed tasting room along Buena Vista Drive. Assuming the proposed tasting room includes the installation of an air conditioning unit with a maximum noise level of 65 dBA $L_{eq}$ at 3 feet, predicted average hourly exterior noise levels at this nearest residential land use would be approximately 31 dBA $L_{eq}$. Predicted noise levels at other nearby existing land uses would be less. Predicted noise levels would not exceed the City's exterior noise standards for non-transportation noise sources of 45 dBA $L_{eq}$ during the nighttime hours or 55 dBA $L_{eq}$ during the daytime hours (refer to Table 4).

Predicted interior operational noise levels at the nearest residential land use would be 6 dBA $L_{eq}$. Based on this noise level predicted interior noise levels would not exceed the City's interior noise standards for non-transportation noise sources of 45 dBA $L_{eq}$ during the daytime hours and 35 dBA $L_{eq}$ during nighttime hours (refer to Table 4). As a result, this impact would be ***less than significant***.

**On-Site Parking Areas**

The proposed project would include multiple parking areas dispersed throughout the project site. Noise levels associated with parking lots typically include vehicle operations, the opening and closing of vehicle doors, and the operation of vehicle sound systems. The nearest parking areas in relation to nearby existing residential areas are located along the western border of the project. The largest of which is the staff and overflow lot which would total approximately 75 parking spaces. This parking area would be located roughly 250 feet from the nearest existing residences located along Buena Vista Drive. Based on this distance and assuming that all 75 parking spaces would be accessed over an approximate 1-hour period, predicted noise levels at these nearest existing residential land uses would be approximately 37 dBA $L_{eq}$ or less. Predicted noise levels associated with other parking areas would be less. Noise calculations for parking areas are included in Appendix A. Predicted noise levels would not exceed the City's noise standards for non-transportation noise sources of 45 dBA $L_{eq}$ during the nighttime hours or 55 dBA $L_{eq}$ during the daytime hours (refer to Table 4).

Predicted interior operational noise levels at the nearest residential land use would be 12 dBA $L_{eq}$. Based on this predicted noise levels would not exceed the City's interior noise standards for non-transportation noise sources of 45 dBA $L_{eq}$ during the daytime hours and 35 dBA $L_{eq}$ during nighttime hours (refer to Table 4). As a result, this impact would be ***less than significant***.

**Long-term Exposure to Increased Roadway Traffic Noise**

Predicted existing traffic noise levels and increases associated with the implementation of the proposed project for both existing and cumulative conditions are summarized in Table 7. As depicted, implementation of the proposed project would result in predicted increases in existing traffic noise levels of up to approximately 0.9 dBA $L_{dn}$. As per the Paso Robles Noise Element, an increase of 3 dBA is seen as significant in areas with pre-project noise environments between 60-65 dBA $L_{dn}$. As depicted in Table 7, existing noise levels at the project site range from 62.3 to 63.7 dBA $L_{eq.}$ Implementation of the proposed project would increase the noise environment by 1 dBA $L_{dn}$ and would not result in a significant increase (i.e., 3 dBA or greater) along area roadways. For this reason, this impact would be considered **less than significant**.

**Table 7**
**Predicted Increases in Traffic Noise Levels**

| Roadway | Predicted CNEL/$L_{dn}$, 50 Feet from Near-Travel Lane Centerline | | Predicted Change | Significant Increase? |
|---|---|---|---|---|
| | Without | With Project | | |
| **Existing** | | | | |
| Buena Vista Drive north of SR 46E | 62.3 | 63.2 | 0.9 | No |
| **Cumulative** | | | | |
| Buena Vista Drive north of SR 46E | 63.7 | 64.3 | 0.6 | No |

*Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on data obtained from the traffic analysis prepared for this project.*
*Significant increase is defined as an increase of 3 dBA, or greater.*

**Compatibility of Proposed Land Uses**

The proposed project includes the construction of a hotel, two wine-tasting rooms, a restaurant, and a conference facility. The City of Paso Robles' Noise Element establishes noise standards for new uses. Residential, hotel, and office land uses are prohibited in areas experiencing traffic or railroad noise above 65 dBA $L_{dn}$ in outdoor areas and 45 dBA $L_{dn}$ in interior spaces (Figure 3).

Predicted future cumulative onsite traffic noise levels would be highest along the eastern boundary of the project site along Buena Vista Drive. The nearest proposed structures are located approximately 110 feet from the center line of Buena Vista Buena Vista Drive. Based on the modeling conducted, predicted exterior traffic noise levels at the nearest structure would be 59 dBA $L_{dn.}$ Assuming an exterior to interior reduction of 25 dBA predicted noise levels at the nearest interior space would be approximately 34 dBA $L_{dn}$. Predicted noise levels would not conflict with the City's noise standards for new uses affected by traffic or railroad noise guidelines. As a result, this impact would be considered **less than significant**.

***Impact Noise-B.*** ***Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?***

In comparison to existing operations, operational activities associated with the proposed project would not involve the use of any new equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Construction required for the proposed project will require equipment typically used in grading (e.g., graders, vibratory rollers, and pavers). Groundborne vibration levels associated with these types of construction equipment would be approximately 0.021 in/sec ppv at 25 feet (Caltrans 2020). The nearest existing off-site structures in relation to proposed onsite construction areas would be located approximately 30 feet, or more, from on-site construction areas. Based on this distance and assuming a maximum vibration level of 0.21 in/sec ppv at

25 feet, predicted vibration levels at the nearest off-site structures would be 0.16 in/sec ppv. Predicted vibration levels at the nearest existing structures would not be projected to exceed commonly applied criteria for structural damage or human annoyance (i.e., 0.5 and 0.2 in/sec ppv, respectively). As a result, this impact would be considered **less than significant**.

| | |
|---|---|
| ***Impact Noise-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 nearest airport is the Paso Robles Municipal Airport located approximately 2 miles northwest of the project site. The proposed project site is not located within the projected noise contours of Paso Robles Municipal Airport (City of Paso Robles 2019). Implementation of the proposed project would not result in the exposure of sensitive receptors to excessive aircraft noise levels, nor would the proposed project affect airport operations. As a result, this impact is considered **less than significant**.

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# APPENDIX A

## Noise Prediction Modeling & Supportive Documentation

**Construction Noise & Vibration Calculations**

**Construction Noise**
Reference Level 85 dB at 50 feet
Distance to receptor 95 feet
Predicted noise level at receptor 79 dBA

**Construction Vibration**

| REFERENCE VIBRATION LEVELS | | |
|---|---|---|
| | | |
| PILE DRIVER-IMPACT | | PPV IN/SEC AT 25 FT |
| | UPPER RANGE | 1.518 |
| | TYPICAL | 0.644 |
| PILE DRIVER-SONIC | | |
| | UPPER RANGE | 0.734 |
| | TYPICAL | 0.17 |
| CLAM SHOVEL DROP (SLURRY WALL) | | 0.202 |
| HYDROMILL (SLURRY WALL) | | |
| | IN SOIL | 0.008 |
| | IN ROCK | 0.017 |
| VIBRATORY ROLLER | | 0.21 |
| HOE RAM | | 0.089 |
| LARGE BULLDOZER | | 0.089 |
| CAISSON DRILLING | | 0.089 |
| LOADED TRUCKS | | 0.076 |
| JACKHAMMER | | 0.035 |
| SMALL BULLDOZER | | 0.003 |

| SOURCE: | Paving |
|---|---|
| REFERENCE LEVEL: | 0.21 |
| ATTENUATION RATE*: | 1.3 |
| DISTANCE | 30 |
| PREDICTED GROUND-BORNE VIBRATION LEVEL: | 0.166 |

**Operational Noise Calculations**

**Building Mechanical Equipment**
Reference Level 65 dB at 3 feet
Distance to receptor 150 feet
Noise level at receptor 31 dBA

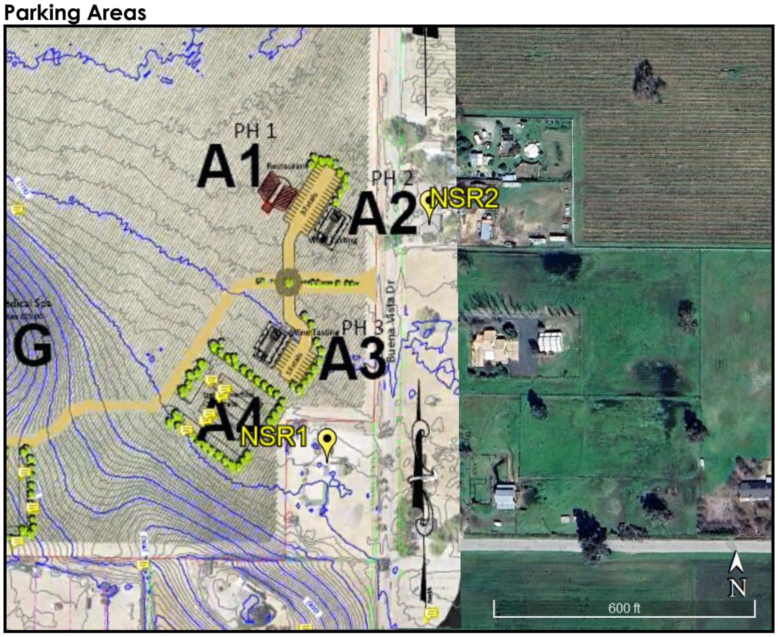
**Wedding Pavilion**
**Onsite**
Reference level 70 dB at 50 feet
Distance to receptor 630 feet
Reduction from topography and terrain -5db
Noise level at receptor 43 dBA
**Offsite**
Reference level 70 dB at 50 feet
Distance to receptor 1000 feet
Noise level at receptor 44 dBA

**Traffic Noise Modeling**

| Assumptions | Existing | Existing + Project | Cumulative | Cumulative + Project |
|---|---|---|---|---|
| Road width | 52 | 52 | 52 | 52 |
| Lanes | 2 | 2 | 2 | 2 |
| Speed | 35 | 35 | 35 | 35 |
| ADT | 7140 | 8690 | 9700 | 11250 |
| Median | 15 | 15 | 15 | 15 |
| CNEL at 50 feet from near travel lane | 62.34 | 63.2 | 63.67 | 64.32 |

**Land Use Compatibility**
Traffic Noise level 64 dB at 50 feet
Distance to receptor 110 feet
Calculated noise level at receptor 59 $L_{dn}$

## Operational Noise Calculations
## Parking Areas




# NSR1

| | |
|---|---|
| Project: | Buena Vista |

**Project Results Summary**

| | |
|---|---|
| Existing Ldn: | 53 dBA |
| Total Project Ldn: | 36 dBA |
| Total Noise Exposure: | 53 dBA |
| Increase: | 0 dB |
| Impact?: | None |

| Receiver Parameters | |
|---|---|
| Receiver: | NSR1 |
| Land Use Category: | 2. Residential |
| Existing Noise (Measured or Generic Value): | 53 dBA |

| Noise Source Parameters | |
|---|---|
| Number of Noise Sources: | 3 |

| Noise Source Parameters | | Source 1 |
|---|---|---|
| | Source Type: | Stationary Source |
| | Specific Source: | Park & Ride Lot |
| Daytime hrs | Avg. Number of Autos/hr | 150 |
| | Avg. Number of Buses/hr | 0 |
| Nighttime hrs | Avg. Number of Autos/hr | 0 |
| | Avg. Number of Buses/hr | 0 |
| Distance | Distance from Source to Receiver (ft) | 250 |
| | Number of Intervening Rows of Buildings | 0 |
| Adjustments | Noise Barrier? | |

**Source 1 Results**

| | |
|---|---|
| Leq(day): | 36.7 dBA |
| Leq(night): | 0.0 dBA |
| Ldn: | 34.6 dBA |

| Noise Source Parameters | | Source 2 |
|---|---|---|
| | Source Type: | Stationary Source |
| | Specific Source: | Park & Ride Lot |
| Daytime hrs | Avg. Number of Autos/hr | 32 |
| | Avg. Number of Buses/hr | 0 |
| Nighttime hrs | Avg. Number of Autos/hr | 0 |
| | Avg. Number of Buses/hr | 0 |
| Distance | Distance from Source to Receiver (ft) | 215 |
| | Number of Intervening Rows of Buildings | 0 |
| Adjustments | Noise Barrier? | No |

**Source 2 Results**

| | |
|---|---|
| Leq(day): | 31.6 dBA |
| Leq(night): | 0.0 dBA |
| Ldn: | 29.6 dBA |
| Incremental Ldn (Src 1-2): | 35.8 dBA |

| Noise Source Parameters | | Source 3 |
|---|---|---|
| | Source Type: | Stationary Source |
| | Specific Source: | Park & Ride Lot |
| Daytime hrs | Avg. Number of Autos/hr | 64 |
| | Avg. Number of Buses/hr | |
| Nighttime hrs | Avg. Number of Autos/hr | |
| | Avg. Number of Buses/hr | |
| Distance | Distance from Source to Receiver (ft) | 550 |
| | Number of Intervening Rows of Buildings | |
| Adjustments | Noise Barrier? | |

**Source 3 Results**

| | |
|---|---|
| Leq(day): | 24.4 dBA |
| Leq(night): | 0.0 dBA |
| Ldn: | 22.5 dBA |
| Incremental Ldn (Src 1-3): | 36.0 dBA |

# NSR 2

| | |
|---|---|
| Project: | Buena Vista |

**Project Results Summary**

| | |
|---|---|
| Existing Ldn: | 53 dBA |
| Total Project Ldn: | 32 dBA |
| Total Noise Exposure: | 53 dBA |
| Increase: | 0 dB |
| Impact?: | None |

| Receiver Parameters | |
|---|---|
| Receiver: | NSR 2 |
| Land Use Category: | 2. Residential |
| Existing Noise (Measured or Generic Value): | 53 dBA |

| Noise Source Parameters | |
|---|---|
| Number of Noise Sources: | 3 |

| Noise Source Parameters | | Source 1 |
|---|---|---|
| | Source Type: | Stationary Source |
| | Specific Source: | Park & Ride Lot |
| Daytime hrs | Avg. Number of Autos/hr | 150 |
| | Avg. Number of Buses/hr | 0 |
| Nighttime hrs | Avg. Number of Autos/hr | 0 |
| | Avg. Number of Buses/hr | 0 |
| Distance | Distance from Source to Receiver (ft) | 590 |
| | Number of Intervening Rows of Buildings | 0 |
| Adjustments | Noise Barrier? | |

**Source 1 Results**

| | |
|---|---|
| Leq(day): | 27.4 dBA |
| Leq(night): | 0.0 dBA |
| Ldn: | 25.4 dBA |

| Noise Source Parameters | | Source 2 |
|---|---|---|
| | Source Type: | Stationary Source |
| | Specific Source: | Park & Ride Lot |
| Daytime hrs | Avg. Number of Autos/hr | 32 |
| | Avg. Number of Buses/hr | 0 |
| Nighttime hrs | Avg. Number of Autos/hr | 0 |
| | Avg. Number of Buses/hr | 0 |
| Distance | Distance from Source to Receiver (ft) | 410 |
| | Number of Intervening Rows of Buildings | 0 |
| Adjustments | Noise Barrier? | No |

**Source 2 Results**

| | |
|---|---|
| Leq(day): | 24.6 dBA |
| Leq(night): | 0.0 dBA |
| Ldn: | 22.6 dBA |
| Incremental Ldn (Src 1-2): | 27.2 dBA |

| Noise Source Parameters | | Source 3 |
|---|---|---|
| | Source Type: | Stationary Source |
| | Specific Source: | Park & Ride Lot |
| Daytime hrs | Avg. Number of Autos/hr | 64 |
| | Avg. Number of Buses/hr | |
| Nighttime hrs | Avg. Number of Autos/hr | |
| | Avg. Number of Buses/hr | |
| Distance | Distance from Source to Receiver (ft) | 250 |
| | Number of Intervening Rows of Buildings | |
| Adjustments | Noise Barrier? | |

**Source 3 Results**

| | |
|---|---|
| Leq(day): | 33.0 dBA |
| Leq(night): | 0.0 dBA |
| Ldn: | 31.0 dBA |
| Incremental Ldn (Src 1-3): | 32.5 dBA |

**NOISE MEASUREMENT SURVEY FORM**

SHEET 1 OF 2

| | |
|---|---|
| DATE: | 2/23/2024 |
| PROJECT: | Buena Vista Vineyards Development |
| LOCATION: | Paso Robles, CA |
| MONITORING STAFF: | Dylan Mick |

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


***NOISE MEASUREMENT CONDITIONS & EQUIPMENT***

| | | | | |
|---|---|---|---|---|
| **MET CONDITIONS & MONITORING EQUIPMENT:** | TEMP: 55 F. \| HUMIDITY: 73 % \| WIND SPEED: 6 MPH \| WIND DIR: E \| GROUND: Dry | | | |
| | CLOUD COVER BY CLASS (OC=OVERCAST): | 3 | (1. HEAVY OC, 2. LIGHT OC, 3. SUNNY, 4. CLEAR NIGHT, 5. OC NIGHT) | |
| | MET. METER: | Kestrel 5500 | | |
| **NOISE MONITORING EQUIPMENT:** | Piccolo Model: | Piccolo-2 | S/N: | P0223052401 |
| | MICROPHONE: | | S/N: | |
| | CALIBRATOR: | REED R8090 | S/N: | 230829349 |
| **NOISE MONITORING SETUP:** | WITHIN 10 FT OF REFLECTIVE SURFACE?: | NO | MICROPHONE HEIGHT AGL (FT): | 5 |
| | CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS: | yes | METER SETTINGS: A-WHT | SLOW |

***NOISE & TRAFFIC MEASUREMENTS***

| MEASUREMENT LOCATION | MEASUREMENT DATE/TIME | ON (Minutes) | MEASUREMENT LOCATION | PRIMARY NOISE SOURCES NOTED | MEASURED NOISE LEVELS LEQ | MEASURED NOISE LEVELS Lmax |
|---|---|---|---|---|---|---|
| ST1 | 2/23/24 10:43 | 10 | Place Roads. Apprx. 350 feet south of East B Street | light duty auto, runner | 62.7 | 78.2 |
| ST2 | 2/23/24 10:57 | 10 | Corner of East B Street and Place Road | light duty autos, dog barking, birds | 59.4 | 82.6 |
| ST3 | 2/23/24 11:20 | 10 | End of Greenbrair Way, next to project site boundary | light duty autos, rooster, various birds | 59.7 | 78.3 |

# NOISE MEASUREMENT SURVEY FORM

| | | | |
|---|---|---|---|
| **SHEET** | **2** | **OF** | **2** |

| | |
|---|---|
| **DATE:** | 2/23/2024 |
| **PROJECT:** | Buena Vista Vineyards Development |
| **LOCATION:** | Paso Robles, CA |
| **MONITORING STAFF:** | Dylan Mick |

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

***MEASUREMENT LOCATION 1***


***MEASUREMENT LOCATION 2***


***MEASUREMENT LOCATION 3***