ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Trinity Redevelopment Tract 18305 Project Update

To: Tabe Van der Zwaag, Associate Planner, City of Rancho Cucamonga

Date: October 14, 2020

Subject: Trinity Redevelopment Tract 18305 Project Update

This memo has been prepared as a statement of validation concerning the CEQA adequacy of the 2018 Air Quality & Greenhouse Gas Emissions Assessment and 2018 Noise Impact Assessment prepared for the Trinity Redevelopment Tract 18305 Project in October 2018. ECORP Consulting has reviewed and compared the original Project plans from 2018 and the updated Project plans from 2020 and determined that the revised plans do not result in a change to the impact determinations (i.e., "less than significant") or any meaningful change in calculated emissions or predicted noise levels.

If you would like to discuss further, please contact me, Seth Myers at (530) 717-7600 or via e-mail at smyers@ecorpconsulting.com.

Sincerely,

Seth a. Myers

Seth Myers
Emissions / Noise Analyst

Trinity Redevelopment Tract 18305 Project

Noise Impact Assessment

Rancho Cucamonga, California

Prepared For:

Trinity Redevelopment
10803 Foothill Blvd., Suite 212
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October 2018

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1.0 INTRODUCTION

This report documents the results of a Noise Impact Assessment completed for the Trinity Redevelopment Tract 18305 Project (Project), which includes the development of six residential units in Rancho Cucamonga. This report was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the City of Rancho Cucamonga General Plan Public Health and Safety Element and Municipal Code. The purpose of this report is to estimate Project-generated noise and to determine the level of impact the Project would have on the environment.

1.1 Project Location and Description

The Project Site is located in the City of Rancho Cucamonga, located in southwestern San Bernardino County (see **Figure 1**). The Project Site is an approximately 4-acre site located west of the southwest corner of the Vista Grove Street / Hermosa Avenue intersection. The irregular shaped site is generally bound by a San Bernardino Flood Control District (SBFCD) access road to the north with residential development beyond, residential housing to the east and west, and an equine boarding and training facility to the south (see **Figure 2**). The Project site currently contains one structure, a small outbuilding, in the southeast corner of the Project site.

Trinity Redevelopment proposes to subdivide the site into six single-family residences. The development would include an approximate 380-foot extension of Vista Grove Street across Hermosa Avenue, which would veer south into a cul-de-sac surrounded by the proposed single-family residences. Construction of the Vista Grove Street extension would result in removal of the SBFCD access gate, which will be replaced just to the west of the road extension. A 15-foot wide equestrian trail easement is proposed to be created along the eastern and southern boundaries of the Project area, connecting to the existing equestrian trail to the west of the project boundary. Access to the equestrian trail will come from the southwest corner of the new Hermosa Avenue and Linda Vista intersection.

The Project site has a City of Rancho Cucamonga General Plan designation of Very Low Residential. The Very Low Residential General Plan designation provides for detached, very low-density single residential units on 0.5-acre lots or larger, with private yards and private parking. This designation generally applies to the foothill areas north of Banyan Street and north of the Pacific Electric Trail in the Etiwanda area.

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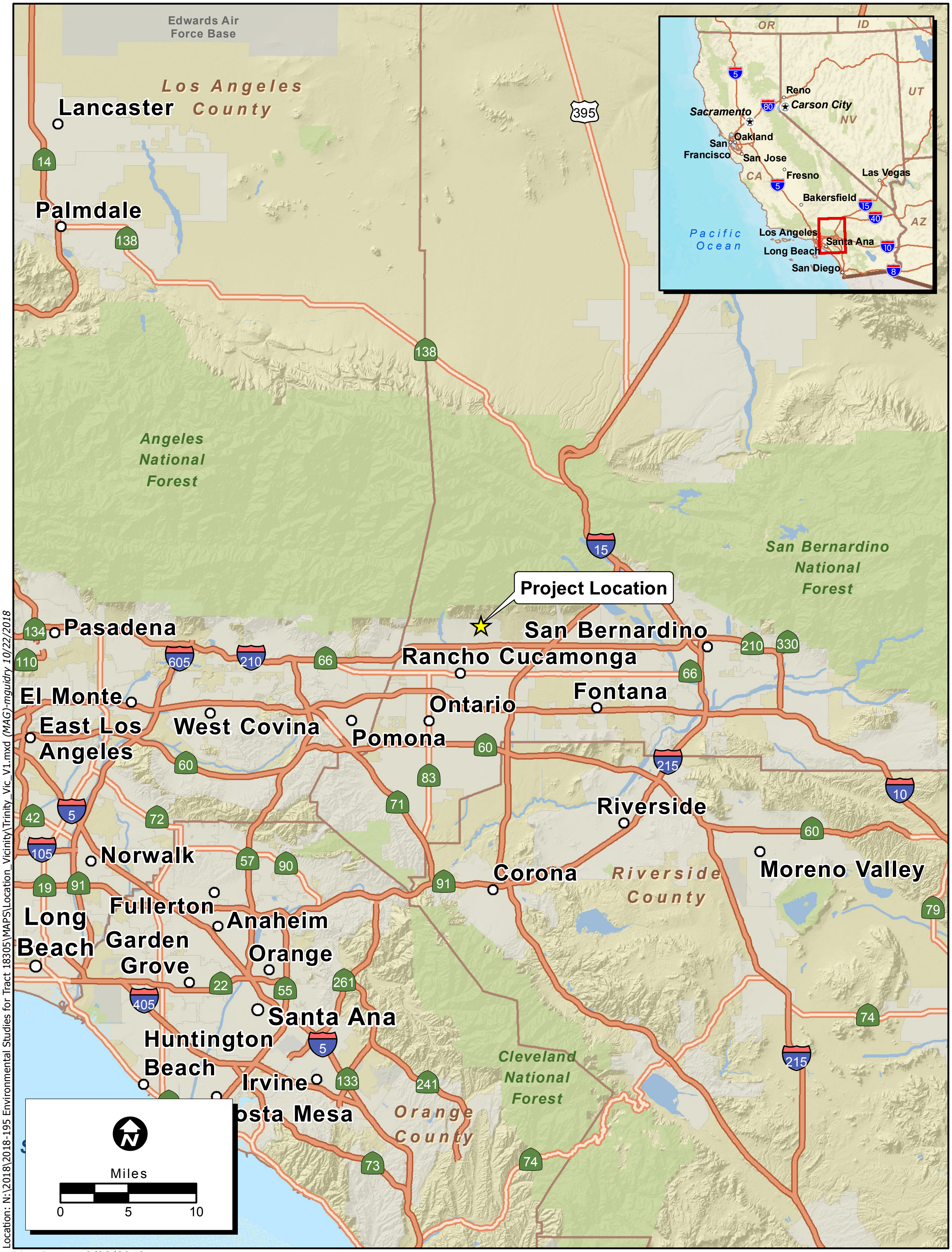

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Service Layer Credits: Sources: Esri, USGS, NOAA

Figure 1. Project Vicinity Map

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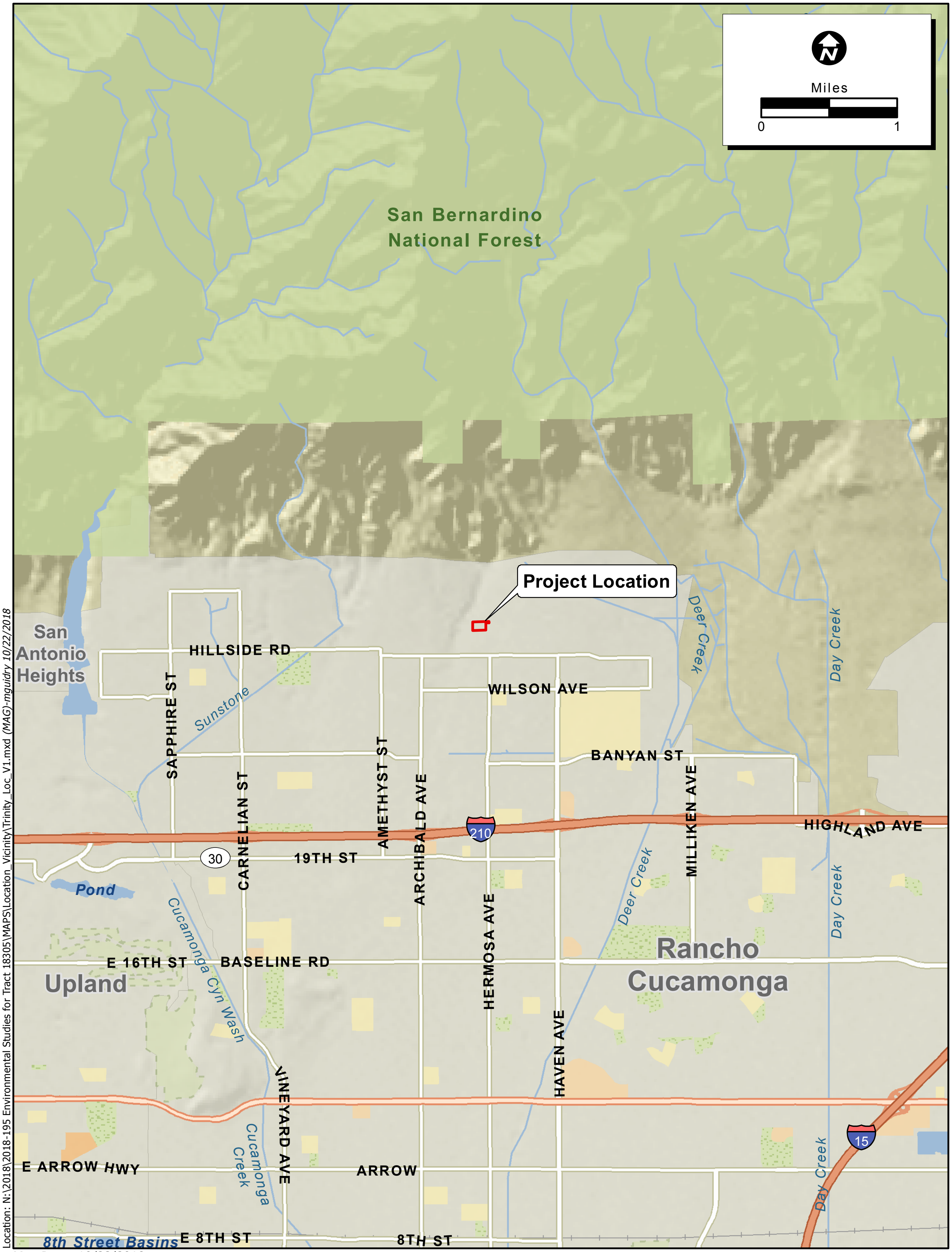

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Map Date: 10/22/2018
Source: ESRI

Figure 2. Project Location

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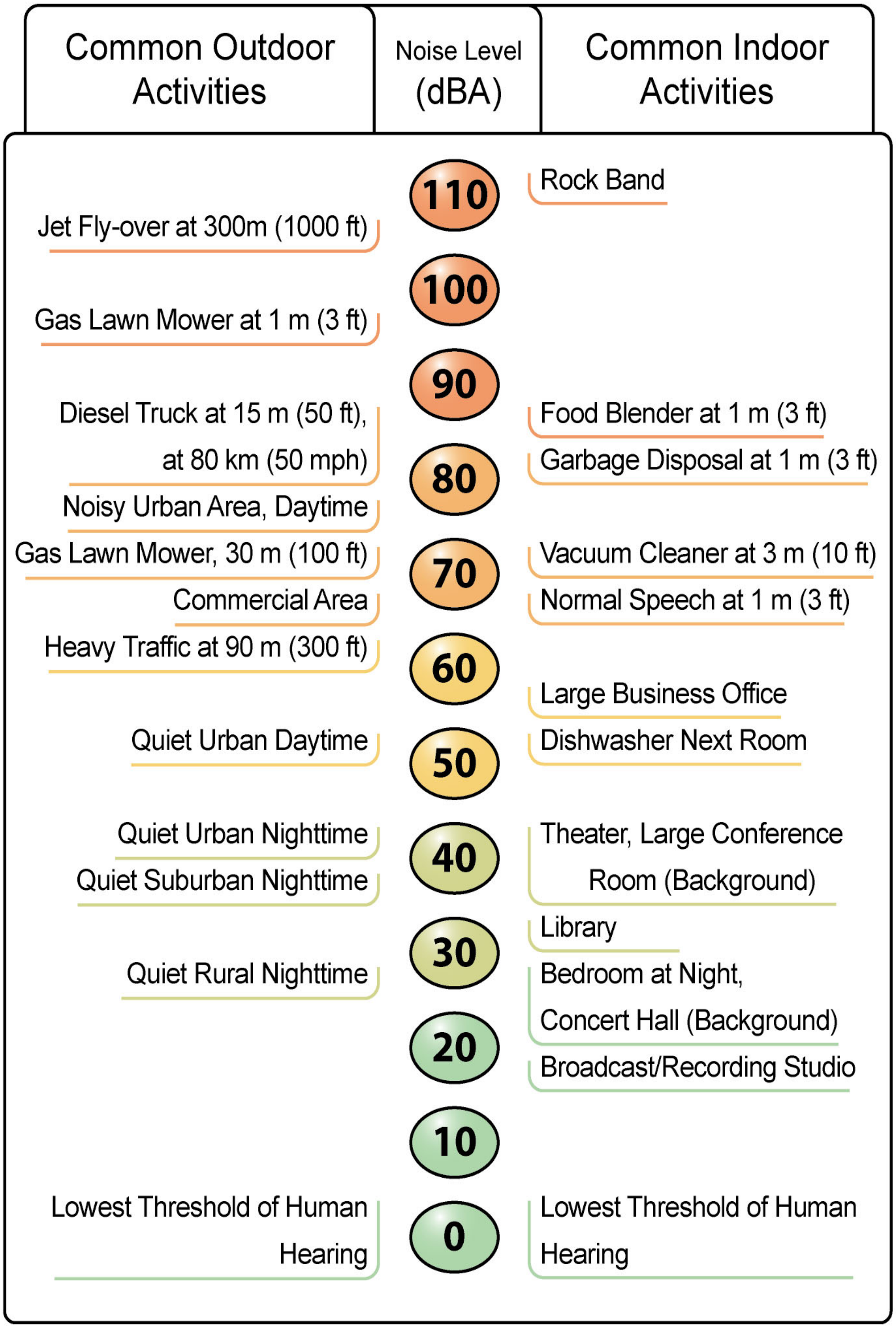
2.0 NOISE BACKGROUND

2.1 Fundamentals of Sound and Environmental Noise

Addition of Decibels

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound and twice as loud as a 60 dBA sound. 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 (FTA 2006). 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). Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Typical noise levels associated with common noise sources are depicted in **Figure 3**.



Source: Caltrans 2012

FIGURE 3. COMMON NOISE LEVELS

Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, 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, such as a roadway, depending on ground surface characteristics (FHWA 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about 5 dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (WEAL 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the "line of sight" between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source, and extend length-wise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

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. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined in **Table 1**.

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

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Table 1. Common Acoustical Descriptors

Descriptor	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, Leq	The average acoustic energy content of noise for a stated period of time. Thus, the Leq of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Lmax, Lmin	The maximum and minimum A-weighted noise level during the measurement period.
L01, L10, L50, L90	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, Ldn or DNL	A 24-hour average Leq with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.4 dBA Ldn.
Community Noise Equivalent Level, CNEL	A 24-hour average Leq with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

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

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

Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise, but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. For ground vehicles, a noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.

2.2 Fundamentals of Environmental Groundborne Vibration

Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Vibration Sources and Characteristics

Table 2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

The PPV descriptor with units of inches per section (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints, for the purposes of this analysis.

Table 2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: Caltrans 2004

2.3 Existing Environmental Noise Setting

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 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. Nearby noise-sensitive land uses consist of single family residences to the north, east and west. The closest residences includes those directly adjacent to the Project site on the east and west.

Existing Ambient Noise Environment

Rancho Cucamonga is impacted by various noise sources. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities. Other sources of noise are the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the city that generate stationary-source noise. The Ontario International Airport is located less than seven miles from the Project site.

The Project site currently consists of one structure, a small outbuilding, in the southeast corner of the Project site.

In order to quantify existing ambient noise levels in the Project area, ECORP Consulting conducted two short-term noise measurements on October 10, 2018. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site (see **Attachment A** for Noise Measurement Locations). The 10-minute measurements were taken between 10:55 a.m. and 11:24 p.m. Short-term (L_{eq}) measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in in **Table 3**.

Table 3. Existing (Baseline) Noise Measurements

Site Number	Location	L_{eq} dBA	L_{min} dBA	L_{max} dBA	Time
1	Center of Project Site; west of Hermosa Avenue and South of Vista Grove Street	43.2	34.6	61.3	10:55 a.m. – 11:05 a.m.
2	At the Corner of Briartree Place & Bramblewood Drive	38.5	37.8	46.7	11:14 a.m. – 11:24 a.m.

Source: Measurements were taken by ECORP Consulting with a Larson Davis SoundExpert LxT precision sound level meter, which satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation. Prior to the measurements, the SoundExpert LxT sound level meter was calibrated according to manufacturer specifications with a Larson Davis CAL200 Class I Calibrator. See ***Attachment A*** *for noise measurement outputs.*

As shown in **Table 3**, the ambient recorded noise levels ranged from 38.5 dBA to 43.2 dBA near the Project site (see **Attachment A** for noise measurement locations). The noise most commonly in the Project vicinity is produced by automotive vehicles (cars, trucks, buses, motorcycles). Traffic moving along streets produces a sound level that remains relatively constant and is part of the Project area's minimum ambient noise level. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, trains, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

3.0 REGULATORY FRAMEWORK

Federal

Occupational Safety and Health Act of 1970

The Federal Occupational Safety and Health Administration (OSHA) regulates on-site noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an 8-hour work shift (29 Code of Regulations [CFR] 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

State

State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

State Office of Planning and Research Noise Element Guidelines

The State Office of Planning and Research Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

Local

City of Rancho Cucamonga General Plan Public Health and Safety Element

The Public Health and Safety Element of the General Plan provides policy direction for minimizing noise impacts on the community and for coordinating with surrounding jurisdictions and other entities regarding noise control. By identifying noise-sensitive land uses and establishing compatibility guidelines for land use and noise, noise considerations will influence the general distribution, location, and intensity of future land use. The result is that effective land use planning and mitigation can alleviate the majority of noise problems.

The most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations within the City that would negative affect noise sensitive land uses. Uses such as schools, hospitals, child care, senior care, congregate care, churches, and all types of residential use should be located outside of any area anticipated to exceed acceptable noise levels as defined by the Noise and Land Use Compatibility Guidelines, or should be protected from noise through sound attenuation measures such as site and architectural design and sound walls. The City of Rancho Cucamonga has adopted these guidelines in a modified form as a basis for planning decisions based on noise considerations. These guidelines are shown in **Table 4**. In the case that the noise levels identified at a proposed project site fall within levels considered normally acceptable, the project is considered compatible with the existing noise environment.

The Project site has a City of Rancho Cucamonga General Plan designation of Very Low Residential. The Very Low Residential General Plan designation provides for detached, very low-density single residential units on 0.5-acre lots or larger, with private yards and private parking. This designation generally applies to the foothill areas north of Banyan Street and north of the Pacific Electric Trail in the Etiwanda area.

Table 4. Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure (CNEL)			
	Normally Acceptable	**Conditionally Acceptable**	**Normally Unacceptable**	**Clearly Unacceptable**
Residential – Low Density, Single-Family, Duplex, Mobile Homes	50 – 60	55 – 65	65 – 75	75 – 85
Residential – Multiple Unit, Mixed Use	50 – 65	60 – 70	70 – 75	75 – 85
Lodging – Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Community Centers, Religious Institutions, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	65 – 85	NA
Sports Arenas, Outdoor Spectator Sports	NA	50 – 75	70 – 85	NA
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 –75	76 – 85
Outdoor Recreation (Commercial and Public)	50 – 75	NA	70 – 80	80 – 85
Office, Retail, and Commercial	50 – 70	67.5 – 77.5	N/A	75 – 85
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	N/A	75 – 85

Source: City of Rancho Cucamonga 2010

Notes:

NA: Not Applicable; CNEL: Community Noise Equivalent Level

Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable – New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable – New construction or development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

The Public Health and Safety Element also contains goals and policies that must be used to guide decisions concerning land uses that are common sources of excessive noise levels. The following relevant and applicable goals and policies from the City's Public Health and Safety Element have been identified for the Project.

Goal PS-13: Minimize the impacts of excessive noise levels throughout the community, and adopt appropriate noise level requirements for all land uses.

- **Policy PS-13.1**: Consider the compatibility of proposed land uses with the noise environment when preparing or revising community and/or specific plans and when reviewing development proposals. The contour map depicting future noise levels (Figure PS-10) should be used by the City as a guide to land use/noise compatibility.
- **Policy PS-13.2**: Consider noise impacts as part of the development review process, particularly the location of parking, ingress/egress/loading, and refuse collection areas relative to surrounding residential development and other noise sensitive land uses.
- **Policy PS-13.3**: Consider the use of noise barriers or walls to reduce noise levels generated by ground transportation noise sources and industrial sources.
- **Policy PS-13.4**: Require that acceptable noise levels are maintained near residences, schools, health care facilities, religious institutions, and other noise sensitive uses in accordance with the Development Code and noise standards contained in the General Plan.
- **Policy PS-13.5**: Limit the hours of operation at noise generating sources that are adjacent to noise-sensitive uses, wherever practical.
- **Policy PS-13.6**: Implement appropriate standard construction noise controls for all construction projects.
- **Policy PS-13.7**: Require all exterior noise sources (construction operations, air compressors, pumps, fans, and leaf blowers) to use available noise suppression devices and techniques to bring exterior noise levels down to acceptable levels.
- **Policy PS-13.9**: Provide, as appropriate, funding to monitor noise levels and investigate noise complaints.
- **Policy PS-13.11**: Continue to work with the surrounding communities to allow for compliance with Rancho Cucamonga's land use and noise compatibility goals and objectives at the City's boundaries.

Goal PS-14: Minimize the impacts of transportation-related noise.

- **Policy PS-14.2**: Require development that is, or will be, affected by railroad noise to include appropriate measures to minimize adverse noise effects on residents and businesses.

<u>City of Rancho Cucamonga Municipal Code</u>

The City of Rancho Cucamonga's regulations with respect to noise are included in Title 17 of the Development Code, also known as the Noise Ordinance. The Noise Ordinance provides noise standards within the City and the following references are those portions of the Noise Ordinance that may be applicable to the Project.

Per Section 17.66.050, the following exterior noise standards apply:

1. It shall be unlawful for any person at any location within the city to create any noise or allow the creation of any noise on the property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on the property line of any other property to exceed the basic noise level as adjusted below:

   a. Basic noise level for a cumulative period of not more than 15 minutes in any one hour; or
   b. Basic noise level plus five dBA for a cumulative period of not more than ten minutes in any one hour; or
   c. Basic noise level plus 14 dBA for a cumulative period of not more than five minutes in any one hour; or
   d. Basic noise level plus 15 dBA at any time.

2. If the measurement location is a boundary between two different noise zones, the lower noise level standard shall apply.

3. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be determined, the measured noise level obtained while the noise is in operation shall be compared directly to the allowable noise level standards as specified respective to the measurement's location, designated land use, and for the time of day the noise level is measured. The reasonableness of temporarily discontinuing the noise generation by an intruding noise source shall be determined by the planning director for the purpose of establishing the existing ambient noise level at the measurement location.

Section 17.66.050 of the Municipal Code outlines residential noise standards. **Table 5** includes the maximum noise limits in residential zones. These are the noise limits when measured at the adjacent residential property line (exterior) or within a neighboring home (interior).

Table 5. Residential Noise Limits

Location of Measurement	Maximum Allowable	
	10:00 p.m. to 7:00 a.m.	7:00 a.m. to 10:00 p.m.
Exterior	60 dBA	65 dBA
Interior	45 dBA	50 dBA

Source: City of Rancho Cucamonga 2018

Additionally, it shall be unlawful for any person at any location within the city to create any noise or to allow the creation of any noise which causes the noise level when measured within any other fully enclosed (windows and doors shut) residential dwelling unit to exceed the interior noise standard in the manner described herein. Also, if the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be determined, each of the noise limits above shall be reduced five dBA for noise consisting of impulse or simple tone noise.

Vibration standards are included in Section 17.66.070 of the City's Municipal Code. Uses that generate vibrations that may be considered a public nuisance or hazard on any adjacent property shall be cushioned or isolated to prevent generation of vibrations. Uses shall be operated in compliance with the following provisions:

A. No vibration shall be produced that is transmitted through the ground and is discernible without the aid of instruments at the points of measurement, nor shall any vibration produced exceed 0.002g peak at up to 50 CPS frequency, measured at the point of measurement using either seismic or electronic vibration measuring equipment. Vibrations occurring at higher than 50 CPS frequency of a periodic vibration shall not induce accelerations exceeding 0.001g. Single-impulse periodic vibrations occurring at an average interval greater than five minutes shall not induce accelerations exceeding 0.01g.
B. Uses, activities, and processes shall not generate vibrations that cause discomfort or annoyance to reasonable persons of normal sensitivity or which endangers the comfort, repose, health, or peace of residents whose property abuts the property line of the parcel.
C. Uses shall not generate ground vibration that interferes with the operations of equipment and facilities of adjoining parcels.
D. Vibrations from temporary construction/demolition and vehicles that leave the subject parcel (e.g., trucks, trains, and aircraft) are exempt from the provisions of this section.

4.0 NOISE IMPACT ASSESSMENT

Thresholds of Significance

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

a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or of applicable standards of other agencies.

b) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project expose people residing or working in the Project area to excessive noise levels.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the Project area to excessive noise levels.

For purposes of this analysis and where applicable, the City of Ranch Cucamonga noise standards were used for evaluation of Project-related noise impacts.

Methodology

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. In order to estimate the worst-case construction noise levels that may occur at the nearest noise-sensitive receptors in the Project vicinity, predicted construction noise levels were calculated utilizing the Federal Highway Administration's Roadway Construction Model (2006). Operational noise levels are addressed qualitatively. Groundborne vibration levels associated with construction-related activities for the Project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from the Caltrans guidelines set forth above. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby land uses.

Impact Analysis

<u>PROJECT CONSTRUCTION NOISE</u>

Would the Project Result in Short-Term Construction-Generated Noise in Excess of City Standards?

Construction noise associated with the proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for on-site construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., building construction, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive receptors in the vicinity of the construction site.

Nearby noise-sensitive land uses consist of single family residences to the north, east and west. As described in Section 17.66.050 of the City's Municipal Code, noise sources associated with construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, are exempt provided said activities:

a. When adjacent to a residential land use, school, church or similar type of use, the noise generating activity does not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday, and provided noise levels created do not exceed the noise standard of 65 dBA when measured at the adjacent property line.

In order to estimate the worst-case construction noise levels that may occur at the nearest noise-sensitive receptors in the Project vicinity, the combined construction equipment noise levels were calculated using the Roadway Noise Construction Model for the demolition, site preparation, grading, paving, building, and coating phases. The anticipated short-term construction noise levels generated during demolition, grading, paving, building, and coating activities are presented in **Table 6**.

Table 6. Construction Average (dBA) Noise Levels by Receptor Distance and Construction Phase – Unmitigated

Description	Estimated Exterior Construction Noise Level @ Adjacent Residences to North, East and West (25' Distance)	Construction Noise Standards (dBA L_{eq})	Exceeds Standards?
Demolition (mobile equipment)	84.6	65.0	**Yes**
Site Preparation (mobile equipment)	78.8		**Yes**
Grading (mobile equipment)	80.7		**Yes**
Building Construction, Paving, & Painting (mobile equipment)	84.5		**Yes**
Building Construction, Paving, & Painting (stationary equipment)	76.5		**Yes**

Source: Traffic noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment B for noise modeling assumptions and results.

Notes: Construction equipment used during each phase derived from CalEEMod 2016.3.2.
Distance between proposed demolition activities and receptors measured from the area of demolition.

L_{eq} = the equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown, noise construction standards for all construction phases would be exceeded. Noise source control is the most effective method of controlling construction noise. Source controls, which limit noise, are the easiest to oversee on a construction project. Mitigation at the source reduces the problem everywhere, not just along one single path or for one receiver. Noise path controls are the second method in controlling noise. Barriers or enclosures can provide a substantial reduction in the nuisance effect in some cases. Path control measures include moving equipment farther away from the receiver; enclosing especially noisy activities or stationary equipment; erecting noise enclosures, barriers, or curtains; and using landscaping as a shield and dissipater.

The following mitigation is recommended:

NOI-1: The following best management practices shall be incorporated during Project construction:

- In order to reduce construction noise, a temporary noise barrier or enclosure shall be used along the property lines of adjacent residences to break the line of sight between the construction equipment and the adjacent residences. The temporary noise barrier shall consist of a solid plywood fence and/or flexible sound curtains attached to chain link fencing.
- Barriers such as flexible sound control curtains shall be erected around stationary heavy equipment to minimize the amount of noise on the surrounding land uses to the maximum extent feasible during construction.
- Construction activities shall be restricted to the hours of 7:00 a.m. to 8:00 p.m. Monday through Saturday and prohibited at any time on Sunday or a federal holiday. The Project's improvement and building plans shall specify this requirement.
- Equipping of all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibiting unnecessary idling of internal combustion engines.
- Locating stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Constructing temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.
- Utilization of "quiet" air compressors and other stationary noise sources where technology exists.
- Control of noise from construction workers' radios to a point where they are not audible at existing residences bordering the Project site.
- Notification of all adjacent residences of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to the adjacent and nearby residences.
- Designation of a "disturbance coordinator" who shall be responsible for responding to any complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

Implementation of mitigation measure **NOI-1** would reduce construction-generated noise levels. According to the Federal Highway Administration, a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise, such as can be accomplished when erecting flexible sound control curtains around stationary heavy equipment, can provide a sound reduction 35 dBA or greater (WEAL 2000). Noise barriers or enclosures such as that required by mitigation measure **NOI-1** can provide a sound reduction robust enough to reduce construction noise to levels below the 65 dBA residential standard at the adjacent property lines.

Would Project Construction Result in a Temporary or Periodic Increase in Ambient Noise Levels in the Project Vicinity Above Levels Existing Without the Project?

As previously described, construction noise associated with the proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for on-site construction activities as well as construction vehicle traffic on area roadways.

As shown in **Table 3**, the ambient recorded noise levels ranged from 38.5 dBA to 43.2 dBA near the Project site. Project construction noise levels forecasted for the proposed construction work would result in noise increases at the sensitive receptors near the Project site, potentially as much as 40 decibels or higher. It should be noted however, that any increase in noise levels at off-site receptors during construction would be temporary, and Project construction would not generate continuously high noise levels; although occasional single-event disturbances from construction are possible.

As previously described, a 3-dBA change in the existing ambient noise environment is just-perceivable to the average human ear outside of the laboratory. A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response. Therefore, an increase in the ambient noise environment, even though temporary, would be considered a substantial increase and mitigation measure **NOI-1** is recommended. Mitigation measure **NOI-1** contains best management practices for reducing construction-generated noise.

PROJECT OPERATIONAL NOISE

Would the Project Result in Operational Noise in Excess of City Standards? Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in the Project Vicinity Above Levels Existing Without the Project?

Project Land Use Compatibility

The Public Health and Safety Element includes a land use compatibility table that provides the City with a tool to gauge the compatibility of new land uses relative to existing noise levels. This table, presented as **Table 4**, identifies normally acceptable, conditionally acceptable, normally unacceptable, clearly unacceptable noise levels for various land uses, including residential land uses such as those proposed by the Project. In the case that the noise levels identified at a proposed project site fall within levels considered normally acceptable, the project is considered compatible with the existing noise environment. As shown in **Table 4**, an acceptable existing noise level for locating residential uses is 50-60 dBA. In order to quantify existing ambient noise levels in the Project area, ECORP conducted two short-term noise measurements on October 10, 2018. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site and are considered representative of the noise levels throughout the day. As shown in **Table 3**, the ambient recorded noise levels ranged from

38.5 dBA to 43.2 dBA near the Project site. As this range falls below 60 dBA, the Project site is considered an appropriate noise environment to locate proposed residential land uses.

Project Operations

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. Nearby noise-sensitive land uses consist of single family residential units directly adjacent to the Project site to the east, west, and north.

Section 17.66.050 limits daytime (7:00 a.m. to 10:00 p.m.) noise levels in residential zones to 65 dBA for exterior levels and 50 dBA for interior levels. Nighttime (10:00 p.m. to 7:00 a.m.) noise levels in residential zones is limited to 60 dBA for exterior levels and 45 dBA for interior levels.

Operational noise sources associated with the proposed Project include off-site mobile and stationary (i.e., mechanical equipment, typical residential neighborhood activities, etc.) sources.

Operational Off- Site Traffic Noise

Project operation would also result in additional traffic on adjacent roadways, thereby increasing vehicular noise in the Project vicinity. According to the ITE's *Trip Generation Manual*, 10th Edition Data, the proposed Project would generate an average of 56 automobile trips daily. According to the California Department of Transportation (Caltrans) *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (2013), doubling of traffic on a roadway would result in an increase of 3 dB (a barely perceptible increase). The proposed Project's minimal daily trips (56 total) would be nominal compared to the current vehicle capacity of Hermosa Avenue, Vista Grove Street, and Hillside Road and thus, would not result in a perceptible increase traffic noise levels. Traffic noise impacts associated with the Project would be less than significant.

Operational Stationary Noise

Potential stationary noise sources related to long-term operation of future development of the Project site would include mechanical equipment. Mechanical equipment (e.g., HVAC equipment) typically generates noise levels less than 40 dBA at 40 feet, which is less than City daytime and nighttime thresholds for stationary sources. The proposed Project places residential uses adjacent to other residential uses. As previously described, the most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations within the City that would negative affect noise sensitive land uses. The Project Site has a General Plan designation of Very Low Residential, which provides for the development of conventional single family detached houses and suburban subdivisions, such as that proposed by the Project. The Project is consistent with the types, intensity, and patterns of land use envisioned for the Project vicinity, and as previously described, the Project is considered compatible with the existing noise environment. Operation of the proposed Project would not result in a significant noise-related impact.

For these reasons, predicted operational Project noise levels would not surpass the City's noise standards.

PROJECT GROUNDBORNE VIBRATION

Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Once operational, the Project would not be a source of groundborne vibration since project operations would not include the use of any stationary equipment that would result in excessive vibration levels. Increases in groundborne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. Construction on the Project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. However, it is noted that construction of the Project would not require the use of pile drivers since a deep foundation is not included as part of the Project design and no subterranean structures are proposed. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with representative construction equipment are summarized in **Table 7**.

Table 7. Vibration Source Amplitudes for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Hoe Ram	0.089
Large Bulldozer	0.042
Caisson Drilling	0.042
Loaded Trucks	0.035
Rock Breaker	0.016
Jackhammer	0.001
Small Bulldozer/Tractor	0.042

Source: FTA 2018

The nearest off-site structures to the Project site are approximately 25 feet distant. As identified in **Table 2** above, 0.2 in/sec PPV is the threshold at which there is a risk of architectural damage to normal dwellings. Based on the vibration levels presented in **Table 7**, ground vibration generated by heavy-duty equipment would not be anticipated to exceed approximately 0.089 in/sec PPV at 25 feet. Furthermore, per Section 17.66.070 of the City Municipal Code, vibrations from temporary construction/demolition and vehicles that leave the subject parcel (e.g., trucks, trains, and aircraft) are exempt from vibration standards.

Therefore, groundborne vibration impacts would be considered less than significant during Project construction.

AIRPORT NOISE

Would the Project Expose People Residing or Working in the Project Area to Excessive Airport Noise Levels?

The Project is located just under seven miles north of Ontario International Airport. The Project site is not located within a noise impact zone in the *LA/ Ontario International Airport Land Use Compatibility Plan* (2011). Furthermore, implementation of the proposed Project would not affect airport operations nor result in increased exposure of noise-sensitive receptors to aircraft noise. Thus, no impact related to airport noise would occur with implementation of the proposed Project.

CUMULATIVE NOISE IMPACTS

Cumulative Construction Noise

Construction activities associated with the proposed Project and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the proposed Project was determined to be less than significant following compliance with the City Municipal Code and mitigation measure **NOI-1**. Cumulative development in the vicinity of the Project site could result in elevated construction noise levels at sensitive receptors in the Project area. However, each project would be required to comply with the applicable City Municipal Code limitations on allowable construction noise limits. Therefore, the Project would not contribute to cumulative impacts and impacts in this regard are not cumulatively considerable.

Cumulative Operational Noise

Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the Project and other projects in the vicinity. Long-term noise sources associated with of the development at the Project, combined with other cumulative projects could cause local noise level increases. Noise levels associated with the proposed Project and related cumulative projects together could result in higher noise levels than considered separately. However, the expected combined cumulative effect within the Project area would not be expected to exceed City standards. Project traffic would not result in a significant increase in traffic noise on a Project level, so the Project's contribution to cumulative impacts would also be less than significant. Additionally, other land use projects in the vicinity would be required to comply with the City's noise level standards and include mitigation measures if this standard is exceeded. Therefore, cumulative noise impacts from operational noise sources would be considered less than significant.

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5.0 REFERENCES

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ATTACHMENT A

Existing (Baseline) Noise Measurements – Project Site Vicinity

Site Number: 1
Recorded By: Jerry Aguirre
Job Number: 2018-195
Date: 10/10/2018
Time: 10:55 a.m.
Location: NL#1: Center of Project Site; west of Hermosa Avenue and South of Vista Grove Street
Source of Peak Noise: Vehicles Traversing Hermosa Avenue & Activities at Equestrian Facility to the South

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
43.2	34.6	61.3	90.9

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**6/27/2017**	
	Microphone	**Larson Davis**	**377B02**	**174464**	**5/19/2017**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**6/1/2017**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**6/13/2017**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** Clear
	Note: dBA Offset = 0.00		**Sensor Height (ft): 4.5** ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	3-5	65	29.8

Photo of Measurement Location

Summary

File Name on Meter	LxT_Data.070
File Name on PC	SLM_0005120_LxT_Data_070.00.ldbin
Serial Number	0005120
Model	SoundExpert® LxT
Firmware Version	2.302
User	Jerry Aguirre
Location	Location #1 (Center of Project site)
Job Description	2018-195 TM Hermosa
Note	

Measurement

Description	
Start	2018-10-10 10:53:13
Stop	2018-10-10 11:03:13
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	2018-10-10 10:48:54
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Fast
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	122.6 dB

	A	C	Z
Under Range Peak	78.9	75.9	**80.9**
Under Range Limit	**27.9**	26.4	33.9
Noise Floor	17.2	17.2	23.6

Results

LAeq	43.2 dB	
LAE	71.0 dB	
EA	1.405 µPa²h	
LZpeak (max)	2018-10-10 11:01:41	90.9 dB
LAFmax	2018-10-10 11:01:17	61.3 dB
LAFmin	2018-10-10 11:02:02	34.6 dB
SEA	-99.9 dB	

LAF > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAF > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**
	43.2	43.2	-99.9

LCeq	55.9 dB
LAeq	43.2 dB
LCeq - LAeq	12.7 dB
LAIeq	47.3 dB
LAeq	43.2 dB
LAIeq - LAeq	4.0 dB

	A		**C**
	dB	**Time Stamp**	**dB**
Leq	43.2		55.9
LF(max)	61.3	2018/10/10 11:01:17	
LF(min)	34.6	2018/10/10 11:02:02	
LPeak(max)			

# Overloads	0	
Overload Duration	0.0	s
# OBA Overloads	0	
OBA Overload Duration	0.0	s

Statistics

LAF5.00	49.1	dB
LAF10.00	46.7	dB
LAF33.30	40.4	dB
LAF50.00	38.9	dB
LAF66.60	37.9	dB
LAF90.00	36.7	dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
Direct	2018-06-04 06:18:32	-29.0
Direct	2018-06-04 05:50:16	-26.4
PRMLxT1L	2018-10-10 10:48:51	-28.9
PRMLxT1L	2018-08-28 11:15:14	-28.9
PRMLxT1L	2018-08-09 08:19:27	-28.9
PRMLxT1L	2018-07-11 12:15:54	-28.8
PRMLxT1L	2018-06-28 14:27:00	-28.9
PRMLxT1L	2018-06-06 11:17:16	-28.8
PRMLxT1L	2018-06-04 08:35:42	-28.8
PRMLxT1L	2018-06-04 08:20:19	-29.0
PRMLxT1L	2018-06-04 06:23:33	-26.4
PRMLxT1L	2018-05-17 13:34:01	-29.0
PRMLxT1L	2018-05-07 08:56:36	-28.9

Site Number: 2

Recorded By: Jerry Aguirre

Job Number: 2018-195

Date: 10/10/2018

Time: 11.14 a.m.

Location: At the Corner of Briartree Place & Bramblewood Drive

Source of Peak Noise: Traffic Traversing Hillsdale Road; Birds

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
38.5	37.8	46.7	75.2

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**6/27/2017**	
	Microphone	**Larson Davis**	**377B02**	**174464**	**5/19/2017**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**6/1/2017**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**6/13/2017**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** Clear
	Note: dBA Offset = 0.00		**Sensor Height (ft): 4.5** ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	1-2	67	29.8

Photo of Measurement Location

Summary

File Name on Meter	LxT_Data.071
File Name on PC	SLM_0005120_LxT_Data_071.00.ldbin
Serial Number	0005120
Model	SoundExpert® LxT
Firmware Version	2.302
User	Jerry Aguirre
Location	Location #2 (Corner of Briartree and Bramblewood)
Job Description	2018-195 TM Hermosa
Note	

Measurement

Description	
Start	2018-10-10 11:14:44
Stop	2018-10-10 11:24:44
Duration	00:10:00.0
Run Time	00:00:00.8
Pause	00:09:59.2
Pre Calibration	2018-10-10 10:48:51
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Fast
Preamp	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	122.6 dB

	A	C
Under Range Peak	78.9	75.9
Under Range Limit	**27.9**	26.4
Noise Floor	17.2	17.2

Results

LAeq	38.5 dB	
LAE	37.5 dB	
EA	0.001 µPa²h	
LZpeak (max)	2018-10-10 11:14:44	75.2
LAFmax	2018-10-10 11:14:44	46.7
LAFmin	2018-10-10 11:14:45	37.8
SEA	-99.9 dB	

LAF > 85.0 dB (Exceedance Counts / Duration)	0	0.0
LAF > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0

Community Noise	**Ldn**	**LDay 07:00-22:00**
	38.5	38.5

LCeq	52.1 dB
LAeq	38.5 dB
LCeq - LAeq	13.6 dB
LAIeq	53.6 dB
LAeq	38.5 dB
LAIeq - LAeq	15.2 dB

	A	
	dB	**Time Stamp**
Leq	38.5	
LF(max)	46.7	2018/10/10 11:14:44
LF(min)	37.8	2018/10/10 11:14:45
LPeak(max)		

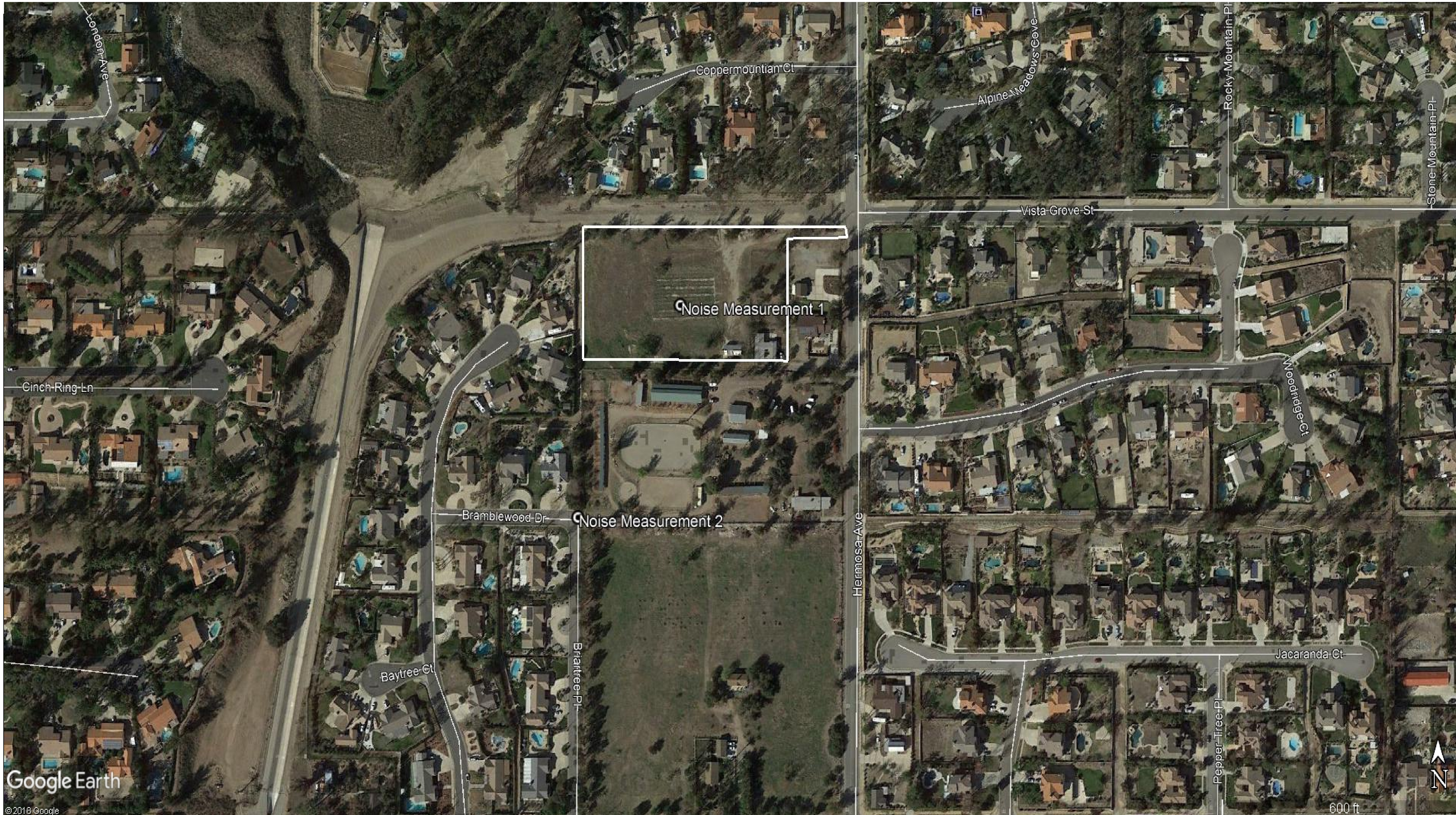
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAF5.00	45.5 dB
LAF10.00	44.4 dB
LAF33.30	41.2 dB
LAF50.00	40.1 dB
LAF66.60	39.2 dB
LAF90.00	38.1 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	2018-06-04 06:18:32	-29.0
Direct	2018-06-04 05:50:16	-26.4
PRMLxT1L	2018-10-10 10:48:51	-28.9
PRMLxT1L	2018-08-28 11:15:14	-28.9
PRMLxT1L	2018-08-09 08:19:27	-28.9
PRMLxT1L	2018-07-11 12:15:54	-28.8
PRMLxT1L	2018-06-28 14:27:00	-28.9
PRMLxT1L	2018-06-06 11:17:16	-28.8
PRMLxT1L	2018-06-04 08:35:42	-28.8
PRMLxT1L	2018-06-04 08:20:19	-29.0
PRMLxT1L	2018-06-04 06:23:33	-26.4
PRMLxT1L	2018-05-17 13:34:01	-29.0
PRMLxT1L	2018-05-07 08:56:36	-28.9



Map Date: *10/25/2018*
Photo (or Base) Source: *Google Earth 2018*

Noise Measurement Locations

2018-195

ATTACHMENT B

Roadway Construction Noise Model Output Files

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/25/2018
Case Description: **Trinity Demolition**

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Demolition	Residential	1	1	1

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Excavator	No	40		80.7	36	0
Excavator	No	40		80.7	166	0
Excavator	No	40		80.7	101	0
Dozer	No	40		81.7	36	0
Dozer	No	40		81.7	101	0
Concrete Saw	No	20		89.6	101	0

Results

		Calculated (dBA)		**Noise Limits (dBA)**						**Noise Limit Exceedance (dBA)**					
				Day		**Evening**		**Night**		**Day**		**Evening**		**Night**	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		70.3	66.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		74.6	70.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		84.5	80.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		75.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw		83.5	76.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	84.5	84.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/25/2018
Case Description: **Trinity Site Preparation**

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Preparation	Residential	1	1	1

Description	**Impact Device**	**Usage(%)**	Equipment **Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Backhoe	No	40		77.6	36	0
Backhoe	No	40		77.6	101	0
Backhoe	No	40		77.6	101	0
Backhoe	No	40		77.6	228	0
Dozer	No	40		81.7	101	0
Dozer	No	40		81.7	228	0
Dozer	No	40		81.7	228	0

Results

		Calculated (dBA)		**Noise Limits (dBA)**						**Noise Limit Exceedance (dBA)**					
				Day		**Evening**		**Night**		**Day**		**Evening**		**Night**	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe		80.4	76.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		71.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		71.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		64.4	60.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		75.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		68.5	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		68.5	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	**80.4**	**78.8**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/25/2018
Case Description: **Trinity Grading**

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Grading	Residential	1	1	1

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Excavator	No	40		80.7	36	0
Dozer	No	40		81.7	101	0
Grader	No	40	85		236	0
Backhoe	No	40		77.6	101	0
Backhoe	No	40		77.6	236	0
Backhoe	No	40		77.6	236	0

Results

		Calculated (dBA)		**Noise Limits (dBA)**						**Noise Limit Exceedance (dBA)**					
				Day		**Evening**		**Night**		**Day**		**Evening**		**Night**	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		75.6	71.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		71.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		71.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		64.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		64.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	**83.6**	**80.7**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date:	10/25/2018
Case Description:	**Trinity Buidling Construction - Mobile Equipment**

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Construction	Residential	1	1	1

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Crane	No	16		80.6	101	0
Gradall	No	40		83.4	36	0
Gradall	No	40		83.4	101	0
Gradall	No	40		83.4	236	0
Backhoe	No	40		77.6	236	0
Backhoe	No	40		77.6	101	0
Front End Loader	No	40		79.1	36	0
Front End Loader	No	40		79.1	101	0
Paver	No	50		77.2	101	0
Paver	No	50		77.2	236	0

Results

	Calculated (dBA)		**Noise Limits (dBA)**						**Noise Limit Exceedance (dBA)**					
			Day		**Evening**		**Night**		**Day**		**Evening**		**Night**	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	74.4	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	86.3	82.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	77.3	73.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	69.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	64.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	71.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	82	78	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	73	69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	71.1	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	63.7	60.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	**86.3**	**84.5**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/25/2018
Case Description: **Trinity Building Construction - Stationary Equipment**

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Construction - Stationar	Residential	1	1	1

Equipment

Description	**Impact Device**	**Usage(%)**	**Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Compressor (air)	No	40		77.7	236	0
Drum Mixer	No	50		80	101	0
Drum Mixer	No	50		80	101	0
Welder / Torch	No	40		74	36	0

Results

		Calculated (dBA)		**Noise Limits (dBA)**						**Noise Limit Exceedance (dBA)**					
				Day		**Evening**		**Night**		**Day**		**Evening**		**Night**	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer		73.9	70.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Drum Mixer		73.9	70.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		76.9	72.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	**76.9**	**76.5**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.