NOISE IMPACT ANALYSIS

SUNSET RESERVOIRS PROJECT

CITY OF REDLANDS

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ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Redlands
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
ONAC	Federal Office of Noise Abatement and Control
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
TTM	Tentative Tract Map
VdB	Vibration velocity level in decibels

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Sunset Reservoirs project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and,
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Site Location and Study Area

The project site is located south of Helen Drive in the City of Redlands (City). There is an existing City reservoir tank located on the west side of Helen Court and the proposed reservoir tanks would be located on the east side of Helen Court on parcels APN 0300-451-25 (7.78 acres) and APN 0300-451-14 (2.50 acres) that total 10.28 acres and are currently vacant. The project site is bounded by vacant land and Helen Drive to the north, vacant land to the east, a single-family home to the south, and Helen Court and the existing reservoir tank to the west. The project study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest sensitive receptor to the project site is a single-family home that is located as near as 280 feet south of the area that would be disturbed as part of the proposed project. There are also single-family homes as near as 730 feet northeast and 780 feet north of the area that would be disturbed as part of the proposed project.

1.3 Proposed Project Description

The City of Redlands Municipal Utilities and Engineering Department proposes the construction of two new above ground 220 foot diameter factory-coated bolt carbon steel tanks that with an approximately 14 million gallon (MG) total capacity from both tanks. To provide uninterrupted water service to its users during the demolition, the City will keep its existing 3 MG reservoir active. It is anticipated that approximately 6.2 acres of the two parcels that total 10.28 acres will be disturbed as part of the proposed project. The proposed site plan is shown in Figure 2.

One driveway will connect the existing water tank and Helen Court. The driveway will be constructed utilizing asphalt/gravel. Two parking spaces will be installed for maintenance purposes. The site will remain unmanned. The existing water tank will continue to function while the new reservoir tanks will be constructed. Maintenance will occur on a monthly and as-needed basis by City employees. Landscaping will be maintained by the City.

The Project is expected to break ground in 2024 and be completed by 2025. Construction activities will take place between 7:00 a.m. to 6:00 p.m. Monday through Saturday. No construction work will occur on Sundays or holidays per the City's Community Noise Control Section Chapter 8.06 of the Municipal Code.

1.4 Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City of Redlands and State of California.

City of Redlands Municipal Code

The following lists the City of Redlands Municipal Code regulations that are applicable to the proposed project.

Section 8.06.120(G) – Construction Activity

Section 8.06.120(G) of the City's Municipal Code exempts noise sources associated with new construction, remodeling, rehabilitation or grading of any property from the City's noise standards provided construction activities that occur do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturdays, with no activities occurring at any time on Sundays or federal holidays. Additionally, all construction equipment must be equipped with functioning mufflers.

Section 8.06.070(A) – Exterior Noise Limits

Section 8.06.070(A) of the City's Municipal Code limits noise to single-family residential uses to 50 dBA between 10:00 p.m. and 7:00 a.m. and to 60 dBA between 7:00 a.m. and 10:00 p.m..

Section 8.06.080(A) –Interior Noise Limits

Section 8.06.080(A) of the City's Municipal Code limits interior noise levels of single-family residential uses to 45 dBA at all times.

State of California Rules

The following lists the State of California rules that are applicable to the proposed project.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

1.5 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

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?

Less than significant impact.

Generation of excessive groundborne vibration or groundborne noise levels?

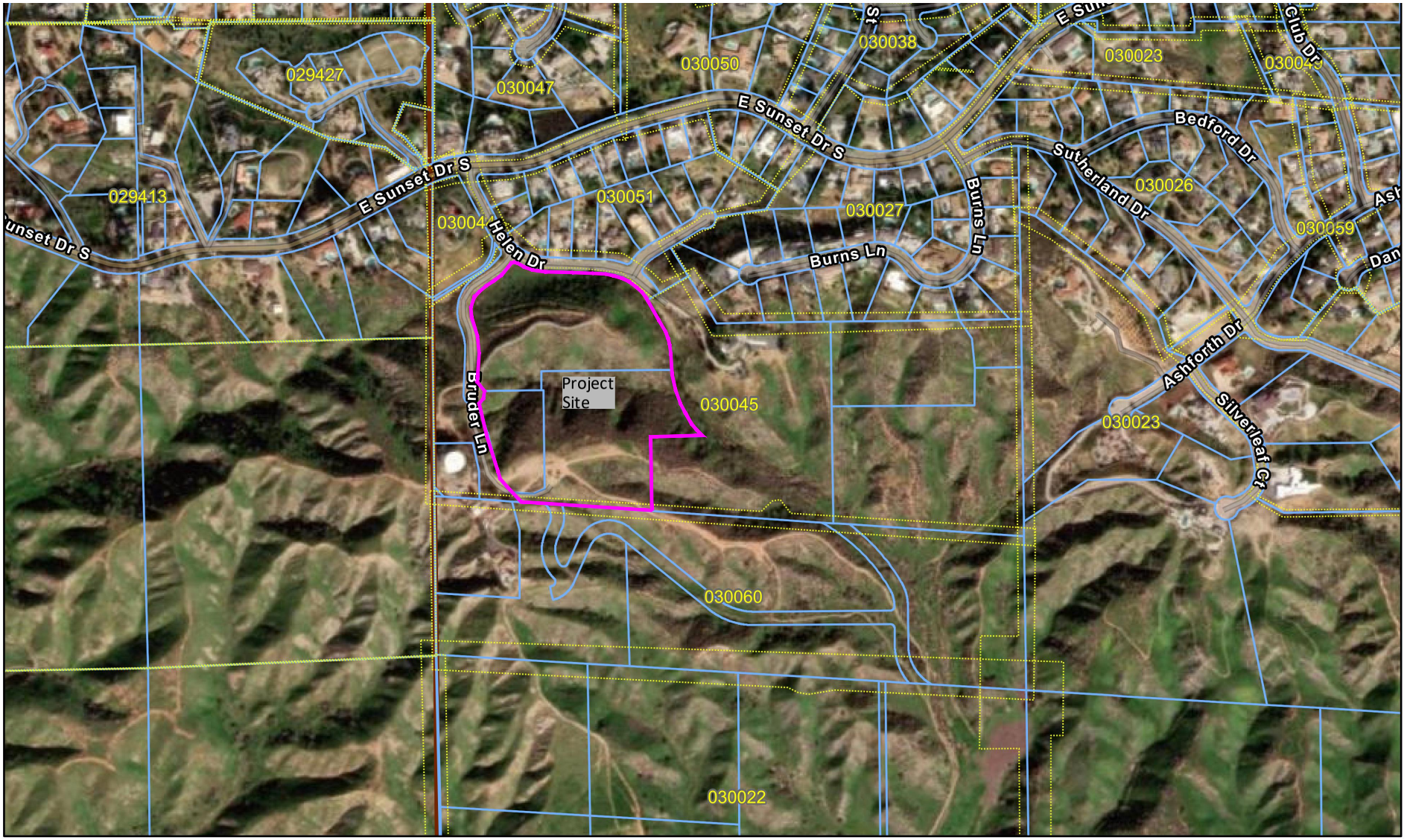
Less than significant impact.

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?

No impact.

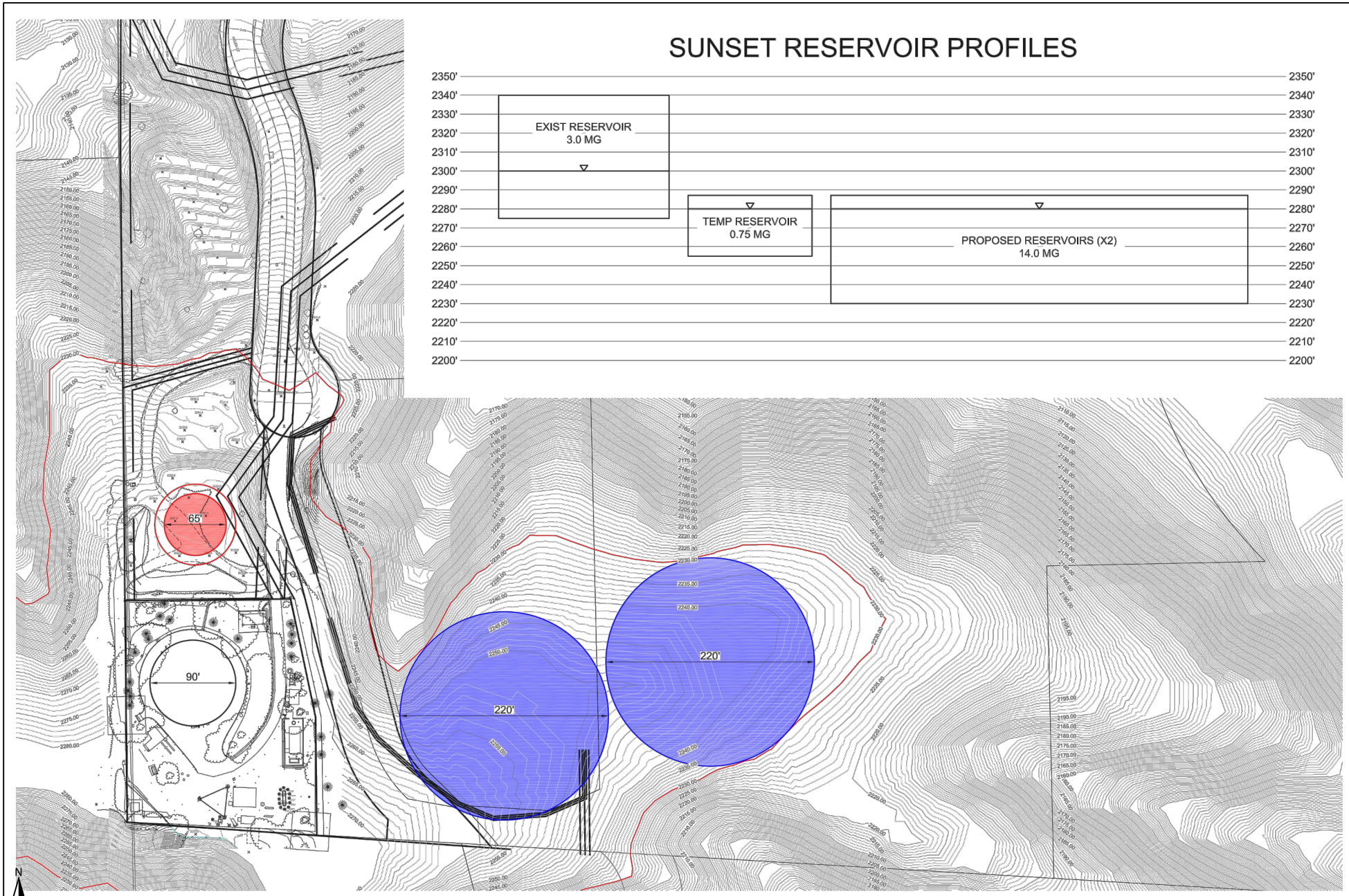
1.6 Mitigation Measures for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4 above, all noise and vibration impacts would be reduced to less than significant levels and no mitigation is required.



VISTA ENVIRONMENTAL

Figure 1
Project Location Map



SOURCE: City of Redlands.

VISTA ENVIRONMENTAL

Figure 2
Site Plan

2.0 NOISE FUNDAMENTALS

The following discussion on noise fundamentals has been obtained from *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (TeNS), prepared by Caltrans, September 2013. Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear.

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, except that it has another addition of 4.77 decibels to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Redlands relies on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a "pure tone," there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to "stand out" against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise

reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

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

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform median, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

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

4.0 REGULATORY SETTING

The project site is located in the City of Redlands. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

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

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Although the proposed project is not under the jurisdiction of the FTA, the *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual), prepared by the FTA, September 2018, is a guidance document from a government agency that has defined what constitutes a significant noise impact from implementing a project. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings for a detailed construction noise assessment are provided below in Table A.

Table A – FTA Construction Noise Criteria

Land Use	Day (dBA $Leq_{(8\text{-hour})}$)	Night (dBA $Leq_{(8\text{-hour})}$)	30-day Average (dBA Ldn)
Residential	80	70	75
Commercial	85	85	80[(1)]
Industrial	90	90	85[(1)]

Notes:
[(1)] Use a 24-hour $Leq_{(24\ hour)}$ instead of $Ldn_{(30\ day)}$.
Source: Federal Transit Administration, 2018.

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

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

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

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the *Transportation and Construction Vibration Guidance Manual* in April 2020. The manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are provided for both transient (i.e., mobile equipment) and continuous (i.e., pile driving) sources of vibration. The Guidance Manual provides thresholds for both building damage, where transient vibration sources may start to create damage to buildings at 0.5 inch per second PPV and from human response, where transient vibration sources become distinctly perceptible at 0.24 inch per second PPV.

4.3 Local Regulations

The City of Redlands General Plan and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Redlands General Plan Implementing Policies

9.0e Use the criteria specified in GP Table 9.1 (see Table B) to assess the compatibility of proposed land uses with the projected noise environment, and apply the noise standards in GP Table 9.2 (see Table C), which prescribe interior and exterior noise standards in relation to specific land uses. Do not approve projects that would not comply with the standards in GP Table 9.2.

Table B – City of Redlands Noise and Land Use Compatibility Matrix

Land Use Categories	Uses	Community Noise Equivalent Level (CNEL)						
		<60	65	70	75	80	>85	
Residential	Single-Family, Duplex, Multiple-Family	A	C	C	C	D	D	D
	Mobile Homes	A	C	C	C	D	D	D
Commercial Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial Regional, Village, District, Special	Commercial, Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial, Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial Recreation Institutional Civic Center	Amphitheatre, Concert Hall, Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	A	B	B	B
Commercial General, Special Industrial, Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional General	Hospital, Church, Library, Schools, Classroom	A	B	C	C	D	D	
Open Space	Parks	A	A	A	B	C	D	D
	Golf Course, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Interpretation:
Zone A: Clearly Compatible. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Zone B: Normally Compatible. New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C: Normally Incompatible. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D: Clearly Incompatible. New construction or development should generally not be undertaken.
Source: Table 7-10 from City of Redlands General Plan, 2017.

Table C – City of Redlands Interior and Exterior Noise Standards

Land Use Categories	Uses	Community Noise Equivalent (CNEL)	
		Interior[(1)]	Exterior[(2)]
Residential	Single-Family, Duplex, Multiple-Family	45[(3,5)]	60
	Mobile Homes	--	60[(4)]
Commercial, Institutional, Open Space	Hotel, Motel, Transient Lodging	45	65[(5)]
	Commercial Retail, Bank, Restaurant	55	--
	Office Building, Research & Development, Professional Offices, City Office Building	50	--
	Amphitheater, Concert Hall, Auditorium, Meeting Hall	45	--
	Gymnasium (Multipurpose)	50	--
	Sports Club	55	--
	Manufacturing, Warehousing, Wholesale, Utilities	60	--
	Movie Theatres	45	--
	Hospital, School's Classroom	45	--
	Parks	--	60

Interpretation:
[1] Indoor environment excluding: bathrooms, toilets, closets, corridors.
[2] Outdoor environment limited to: private yard of single-family as measured at the property line; multi-family private patio or balcony which is served by a means of exit from inside; mobile home park, hospital patio; park picnic area; school playground; hotel and recreational area..
[3] Noise level requirement with closed windows, if they are used to meet natural ventilation requirement.
[4] Exterior noise level should be such that interior noise level will not exceed 45 CNEL.
[5] Except those areas affected by aircraft noise.
See also Policy 9.0s.
Source: Table 9.2 from City of Redlands General Plan, 2017.

9.0f Require a noise impact evaluation based on noise measurements at the site for all projects in Noise Referral Zones (B, C, or D) as shown on GP Table 9.1 (see Table B) and on GP Figure 9.1 or as determined from tables in the Appendix, as part of the project review process. Should measurements indicate that unacceptable noise levels will be created or experienced, require mitigation measures based on a detailed technical study prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California with a minimum of three years experience in acoustics).

9.0i Require construction of barriers to mitigate sound emissions where necessary or where feasible, and encourage use of walls and berms to protect residential or other noise sensitive land uses that are adjacent to major roads, commercial, or industrial areas.

9.0s Require mitigation to ensure that indoor noise levels for residential living spaces not exceed 45 dB LDN/CNEL due to the combined effect for all exterior noise sources.

The Uniform Building Code (specifically, the California Administrative Code, Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Sections T25-28) requires that "Interior community noise levels (CNEL/LDN) with windows closed, attributable to exterior sources shall not exceed an annual CNEL or LDN of a 45 dB in any habitable room." The code requires that this standard be applied to all new hotels, motels, apartment houses and dwellings other than detached single-family dwellings.

Policy 9-s sets the maximum acceptable interior noise level at 45 CNEL. The Noise Referral Zones (65 CNEL) delineate areas within which tests to ensure compliance are to be required for new structures

9.0u Require all new residential projects or replacement dwellings to be constructed near existing sources of non transportation noise (including but not limited to commercial facilities or public parks with sports activities) to demonstrate via an acoustical study conducted by a Registered Engineer that the indoor noise levels will be consistent with the limits contained in the Community Noise Ordinance (see Table C).

9.0v Consider the following impacts as possibly "significant":

- An increase in exposure of four or more dB if the resulting noise level would exceed that described as clearly compatible for the affected land use, established in GP Table 9.1 [Table 7-10] and GP Table 9.2 [Table 7-11];
- Any increase of six dB or more, due to the potential for adverse community response.

City of Redlands Municipal Code

The City of Redlands Municipal Code establishes the following applicable standards related to noise.

Section 8.06.030 – General Noise Regulations

It shall be unlawful for any person to willfully or negligently make, or cause to be made, any loud, unnecessary or unusual noise which disturbs the peace and quiet of any neighborhood or which causes discomfort or annoyance to a reasonable person of normal sensitivity in the area. The factors that may be considered in determining whether a violation of this chapter exists include, but are not limited to, the following:

A. The sound level of the objectionable noise;

B. The sound level of the ambient noise;

C. The proximity of the noise to residential living or sleeping facilities;

D. The nature and zoning of the area within which the noise emanates;

E. The number of persons affected by the noise;

F. The time of day or night the noise occurs;

G. The duration of the noise;

H. The tonal, informative or musical content of the noise;

I. Whether the noise is continuous, recurrent, or intermittent;

J. Whether the noise is produced by a commercial or noncommercial activity;

K. Whether the nature of the noise is usual or unusual;

L. Whether the origin of the noise is natural or unnatural; and

M. Whether the noise occurs on a weekday, weekend or a holiday.

Section 8.06.070 – Exterior Noise Limits

A. The noise standards for the categories of land uses identified in Table 1 (see Table D) of this section shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

B. No person shall operate, or cause to be operated, any source of sound at any location within the city or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level when measured on any other property to exceed:

1. The noise standard for that land use specified in Table 1 of this section for a cumulative period of more than thirty (30) minutes in any hour; or
2. The noise standard specified in Table 1 of this section plus five (5) dB for a cumulative period of more than fifteen (15) minutes in any hour; or
3. The noise standard specified in Table 1 of this section plus ten (10) dB for a cumulative period of more than five (5) minutes in any hour; or
4. The noise standard specified in Table 1 of this section plus fifteen (15) dB for a cumulative period of more than one minute in any hour; or
5. The noise standard specified in Table 1 of this section plus twenty (20) dB or the maximum measured ambient level, for any period of time.

C. If the measured ambient level exceeds the allowable noise exposure standard within any of the first four (4) noise limit categories below, the allowable noise exposure standard shall be adjusted in five (5) dB increments in each category as appropriate to encompass or reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

D. The ambient noise shall be measured at the same location along the property line utilized in subsection 8.06.06B of this chapter, with the alleged offending noise source inoperative. If the alleged offending noise source cannot be shut down, the ambient noise shall be estimated by performing a measurement in the same general area of the source but at sufficient distance that the noise from the source is at least ten (10) dB below the ambient in order that only the ambient level be measured. If the difference between the ambient and noise source is five (5) to ten (10) dB, then the level of the ambient itself can be reasonably determined by subtracting a one decibel correction to account for the contribution of the source.

E. In the event the alleged offensive noise contains a steady, audible tone such as a whine, screech, hum, or is a repetitive noise such as a hammering or riveting, or contains music or speech conveying informational content, the standard limits set forth in Table 1 of this section shall be reduced by five (5) dB.

Table D – City of Redlands Maximum Permissible Sound Levels By Receiving Land Use

Receiving Land Use Category	Time Period	Noise Level (dBA)
Single-Family Residential Districts	10:00 p.m. – 7:00 a.m.	50
	7:00 a.m. – 10:00 p.m.	60
Multi-Family Residential Districts, Public Space, Institutional	10:00 p.m. – 7:00 a.m.	50
	7:00 a.m. – 10:00 p.m.	60
Commercial	10:00 p.m. – 7:00 a.m.	60
	7:00 a.m. – 10:00 p.m.	65
Industrial	Any time	75

Source: City of Redlands Municipal Code Section 8.06.070.

Section 8.06.080 – Interior Noise Standards

A. No person shall operate or cause to be operated any source of sound, or allow the creation of any noise, which causes the noise level when measured inside a neighboring receiving occupied building to exceed the following standards.

1. The noise standard for that land use specified in Table 2 (see Table E) of this section for a cumulative period of more than five (5) minutes in any hour.
2. The noise standard for that land use specified in Table 2 of this section plus five (5) dB for a cumulative period of more than one minute in any hour.
3. The noise standard for that land use specified in Table 2 of this section plus ten (10) dB for the maximum measured ambient noise level for any period of time.

Table E – City of Redlands Maximum Permissible Interior Sound Levels By Receiving Land Use

Receiving Land Use Category	Time Period	Noise Level (dBA)
Single-Family Residential Districts	Any time	45
Multi-Family Residential Districts, Institutional, Hotels	Any time	45
Commercial	Any time	50
Industrial	Any time	60

Source: City of Redlands Municipal Code Section 8.06.080.

B. If the measured ambient level exceeds the allowable exterior noise exposure standard in Table 1 (see Table D) of this chapter, the allowable interior noise exposure level shall be adjusted in five (5) dB increments as appropriate too reflect the ambient noise level.

Section 8.06.090 – Noise Disturbances Prohibited

The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:

F. Construction And/Or Demolition: Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekday hours of six o'clock (6:00) P.M. and seven o'clock (7:00) A.M., including Saturdays, or at any time on Sundays or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work by public service utilities, the city or another government entity. All mobile

or stationary internal combustion engine powered equipment or machinery shall be equipped with exhaust and air intake silencers in proper working order, or suitable to meet the standards set forth herein.

G. Vibration: Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet (150') from the source if on a public space or public right of way.

Section 8.06.120 – Exemptions

A. Emergency Exemption: This chapter shall not apply to:

1. The emission of sound for the purpose of alerting persons to the existence of an emergency such as, but not limited to, loudspeakers, horns, sirens, whistles or other similar devices which emit sound, only for the time required to make notification of the emergency condition; or
2. The emission of sound in the performance of emergency work or the temporary provision of essential services such as, but not limited to, utility system repairs or upgrades, infrastructure repairs, structural repairs and other unscheduled, infrequent and nonrecurring activities, required to protect persons and property from physical harm or loss of essential services.

B. Warning Devices: This chapter shall not apply to warning devices necessary for the protection of public safety. Police, fire and ambulance sirens and train horns are exempt from this chapter.

C. Outdoor Activities: This chapter shall not apply to occasional outdoor public gatherings, public dances, shows, and sporting and entertainment events conducted within city parks and city owned facilities, including events conducted at the Redlands Bowl, provided such events are conducted pursuant to a permit or license issued by the city.

D. School Activities: This chapter shall not apply to activities and operations conducted on the grounds of any public or private elementary, intermediate or secondary school or colleges and universities.

E. Hospital: This chapter shall not apply to activities and operations conducted within the grounds of the Redlands Community Hospital provided that said activities and operations are in compliance with the acoustical provisions of the hospital's conditional use permit.

F. Minor Maintenance Of Residential Property: This chapter shall not apply to noise sources associated with the minor maintenance of residential property, provided such activities take place between the hours of seven o'clock (7:00) A.M. to eight o'clock (8:00) P.M. on weekdays, and seven o'clock (7:00) A.M. to eight o'clock (8:00) P.M. on weekends and legal holidays, and provided that such activities generate no more than ninety (90) dBA at or within the real property line of the residential property. Activities covered under this provision include, but are not limited to, maintenance of landscaping and minor repair of residential dwellings or ancillary structures.

G. Construction Activities: This chapter shall not apply to noise sources associated with new construction, remodeling, rehabilitation or grading of any property provided such activities take place between the hours of seven o'clock (7:00) and six o'clock (6:00) P.M. on weekdays, including Saturdays, with no activities taking place at any time on Sundays or federal holidays. All motorized equipment used in such activity shall be equipped with functioning mufflers.

H. Agricultural Operations: This chapter shall not apply to mobile noise sources associated with agricultural operations for use in maintenance, cultivation, planting and harvesting of agricultural areas provided said activities take place between the hours of seven o'clock (7:00) A.M. to eight o'clock (8:00)

P.M. on weekdays including Saturdays, with no activities taking place at any time on Sundays or federal holidays. All motorized equipment used in such activity shall be equipped with functioning mufflers.

I. Chapter Application: This chapter shall not apply to any activity in which state or federal law has preempted the regulation of such activity.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise levels, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the proposed project area is generally relatively low compared to the rest of the City. The primary noise sources in the project vicinity consist of vehicles operating on Helen Court and Helen Drive and from mechanical equipment associated with the telecommunications towers next to the existing water tank. The following describes the measurement procedures, measurement locations, noise measurement results, and the modeling of the existing noise environment.

5.1 Noise Measurement Equipment

The noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4-2014 standard).

Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise levels in the vicinity of the project site. Descriptions of the noise monitoring sites are provided below in Table F and are shown in Figure 3. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 3:25 p.m. and 4:04 p.m. on Monday, August 28, 2023. During the noise measurements, the sky was clear (no clouds), the temperature was 103 degrees Fahrenheit, the humidity was 23 percent, barometric pressure was 27.68 inches of mercury, and the wind was blowing at an average rate of five miles per hour.

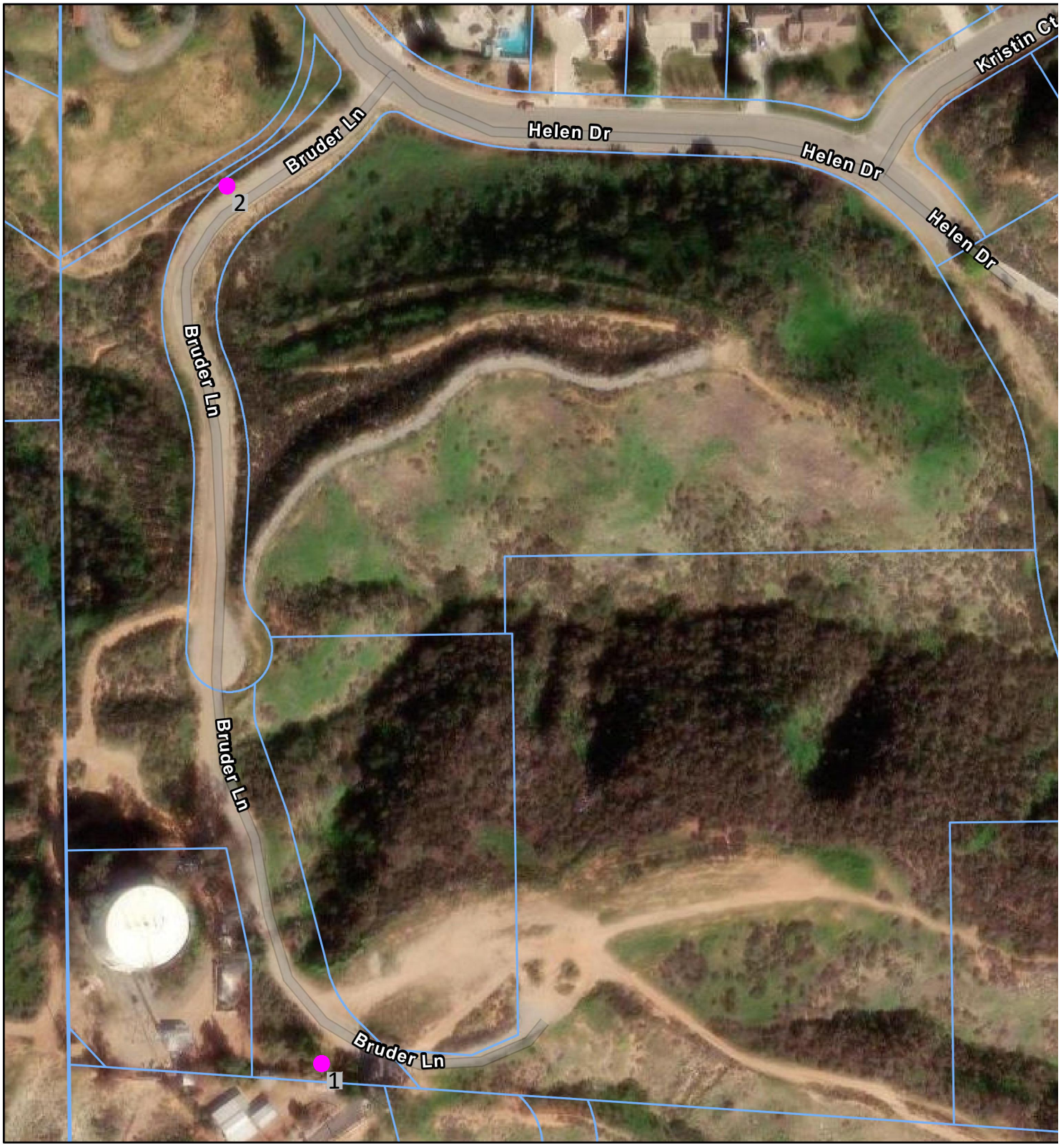
5.2 Noise Measurement Results

The results of the noise level measurements are presented in Table F and the noise monitoring data printouts are included in Appendix B.

Table F – Existing (Ambient) Noise Measurement Results

Site No.	Description	Primary Noise Source	Start Time of Measurement	Measured Noise Level	
				dBA Leq	dBA Lmax
1	Located southwest of proposed reservoirs, approximately 40 feet southwest of Helen Court centerline and 20 feet north of fence for home at 13202 Bruder Lane	Vehicles on Helen Court and mechanical equipment	3:25 p.m.	46.8	58.8
2	Located north of proposed reservoirs at Teddy's Trailhead, approximately 15 feet north of Helen Court centerline.	Vehicles on Helen Court and Helen Lane	3:49 p.m.	51.3	73.2

Notes: Noise measurements taken with a Larson-Davis Model 831 Type 1 precision sound level meter on Monday, August 28, 2023.



VISTA ENVIRONMENTAL

Figure 3
Field Noise Monitoring Locations

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table G below provides a list of the construction equipment anticipated to be used for each phase of construction, which was obtained from the *Air Quality and Greenhouse Gas Emissions Impact Analysis Sunset Reservoirs Project* (Air Quality Analysis), prepared by Vista Environmental, October 2, 2023.

Table G – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 Lmax at 50 feet[2] (dBA, slow[3])	Actual Measured Lmax at 50 feet[4] (dBA, slow[3])
Site Preparation				
Rubber Tired Dozer	3	40	85	83
Tractor, Loader, or Backhoe	4	40	84	N/A
Grading				
Excavators	1	40	85	81
Grader	1	40	85	83
Rubber Tired Dozer	1	40	85	82
Tractor, Loader or Backhoe	3	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	3	40	85	83
Generator	1	50	82	81
Tractor, Loader or Backhoe	3	40	84	N/A
Welder	1	40	73	74
Paving				
Paver	2	50	85	77
Paving Equipment	2	50	85	77
Rollers	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:
[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] Spec 721.560 is the equipment noise level utilized by the RCNM program.
[3] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[4] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
Source: Federal Highway Administration, 2006 and CalEEMod default equipment mix.

Table G also shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed in Table G and through use of the RCNM. For each phase of construction, all construction

equipment was analyzed based on being placed in the middle of the project site, per the FTA Manual for a General Assessment, and is based on the rational that mobile equipment would likely move around the entire project site in a typical workday. As such, the middle of project site would provide the acoustical average noise level created over a typical workday. However, in order to provide a conservative analysis, all equipment was analyzed, instead of just the two nosiest pieces of equipment as detailed in the FTA Manual. The RCNM model printouts are provided in Appendix C.

6.2 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table H gives approximate vibration levels for particular construction activities. The data in Table H provides a reasonable estimate for a wide range of soil conditions.

Table H – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, September, 2020.

The construction-related vibration impacts have been calculated through the vibration levels shown above in Table H and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table G.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundborne vibration or groundborne noise levels; or
- 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.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. The following section calculates the potential noise emissions associated with the temporary construction activities and long-term operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

The construction activities for the proposed project are anticipated to include site preparation and grading of approximately 6.2 acres, building construction of the proposed reservoirs, paving of an onsite driveway and parking spaces, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. The nearest sensitive receptor to the project site is a single-family home that is located as near as 280 feet south of the area that would be disturbed as part of the proposed project. There are also single-family homes as near as 730 feet northeast and 780 feet north of the area that would be disturbed as part of the proposed project.

Section 8.06.120(G) of the City's Municipal Code exempts noise sources associated with new construction, remodeling, rehabilitation or grading of any property from the City's noise standards provided construction activities that occur do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and Saturdays, with no activities occurring at any time on Sundays or federal holidays. However, the City construction noise standards do not provide any limits to the noise levels that may be created from construction activities and even with adherence to the City standards, the resultant construction noise levels may result in a significant substantial temporary noise increase to the nearby residents.

In order to determine if the proposed construction activities would create a significant substantial temporary noise increase, the FTA construction noise criteria thresholds detailed above in Section 4.1 have been utilized, which shows that a significant construction noise impact would occur if construction noise exceeds 80 dBA during the daytime at any of the nearby homes or school classrooms.

Construction noise impacts to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table G – Construction Equipment Noise Emissions and Usage Factors. The results are shown below in Table I and the RCNM printouts are provided in Appendix C.

Table I – Construction Noise Levels at the Nearby Sensitive Receptors

Construction Phase	Construction Noise Level (dBA Leq) at:		
	Home to South[1]	Home to Northeast[2]	Home to North[3]
Site Preparation	66	62	62
Grading	65	61	61
Building Construction	66	61	62
Paving	61	57	57
Painting	53	49	49
FTA Construction Noise Threshold	**80**	**80**	**80**
Exceed Thresholds?	No	No	No

Notes:
[1] The home to south is located as near as 530 feet from the center of the area disturbed.
[2] The home to northeast is located as near as 870 feet from the center of the area disturbed.
[3] The home to north is located as near as 840 feet from the center of the area disturbed.
Source: RCNM, Federal Highway Administration, 2006 (see Section 6.1 above for detailed description of modeling assumptions)

Table I shows that greatest construction noise impacts would occur during the site preparation, with noise levels as high as 66 dBA Leq at the nearest home to the south and 62 dBA at the homes to the northeast and north. All calculated construction noise levels shown in Table I are within the FTA daytime construction noise standard of 80 dBA averaged over eight hours. Therefore, through adherence to the limitation of allowable construction times provided in Section 8.06.120(G) of the City's Municipal Code, construction-related noise levels would not exceed any standards established in the General Plan or Noise Ordinance nor would construction activities create a substantial temporary increase in ambient noise levels from construction of the proposed project. Impacts would be less than significant.

Operational-Related Noise

In general, operation of the new reservoir tanks will be passive as there will be no equipment installed on the reservoir tanks that creates noise. The existing water tank will continue to function while the new reservoir tanks are constructed. Currently, maintenance on the existing water tank occurs on a monthly and as-needed basis by City employees, that includes landscaping. No change would occur between the maintenance activities for the existing water tank and proposed reservoir tanks. As such, operation of the proposed project would not create any additional sources of noise, over which is currently being created, and no operational noise modeling was performed. As such, less than significant noise impacts would occur from operation of the proposed project.

Level of Significance

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

The construction activities for the proposed project are anticipated to include site preparation and grading of approximately 6.2 acres, building construction of the proposed reservoirs, paving of an onsite driveway and parking spaces, and application of architectural coatings. Vibration impacts from construction activities associated with the proposed project would typically be created from the operation of heavy off-road equipment. The nearest sensitive receptor to the project site is a single-family home that is located as near as 280 feet south of the area that would be disturbed as part of the proposed project

Section 9.06.090(G) limits vibration activities to vibration levels that are not discernible at or beyond the boundary line of private property or at 150 feet from the vibration source if on a public space or public right of way. Based on these standards, there is potential that groundborne vibration may expose persons to excessive vibration levels. Since the City does not provide any quantitative vibration thresholds for what is considered discernible, the Caltrans vibration thresholds have been utilized in this analysis, which defines the threshold for building damage to structures at 0.5 inch per second PPV and the threshold for distinctly perceptible human annoyance of 0.24 inch per second PPV from transient sources.

The primary source of vibration during construction would be from the operation of a bulldozer. From Table H above a bulldozer would create a vibration level of 0.089 inch per second PPV at 25 feet. Based on typical propagation rates, the vibration level at the nearest sensitive receptors (280 feet to the south) would be 0.006 inch per second PPV, which would be below both Caltrans exceed both the 0.5 inch per second PPV threshold for damage to structures and the human annoyance threshold of 0.24 inch per second PPV. Impacts would be less than significant.

Operations-Related Vibration Impacts

The proposed project would consist of the development of two new reservoir tanks. The on-going operation of the proposed project would not include the operation of any equipment that creates vibration and would not include any other known vibration sources. Therefore, a less than significant vibration impact is anticipated from operation of the proposed project.

Level of Significance

Less than significant impact.

7.4 Aircraft Noise

The proposed project would not expose people residing or working in the project area to excessive noise levels from aircraft. The nearest airport is Redlands Municipal Airport that is located approximately 4.8 miles north of the project site. The project site is located outside of the 60 dBA CNEL noise contours of Redlands Municipal Airport. No impacts would occur from aircraft noise.

Level of Significance

No impact.

8.0 REFERENCES

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

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

Coffman Associates, *Airport Layout Plan Narrative Report for San Bernardino International Airport,* November 2010.

City of Redlands, *City of Redlands General Plan 2035,* Adopted December 5, 2017.

City of Redlands, *City Code of Redlands, California,* December 17, 2019.

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

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

APPENDIX A

Field Noise Measurements Photo Index

Noise Measurement Site 1 - looking north

Noise Measurement Site 1 - looking northeast

Noise Measurement Site 1 - looking east

Noise Measurement Site 1 - looking southeast

Noise Measurement Site 1 - looking south

Noise Measurement Site 1 - looking southwest

Noise Measurement Site 1 - looking west

Noise Measurement Site 1 - looking northwest

Noise Measurement Site 2 - looking north

Noise Measurement Site 2 - looking northeast

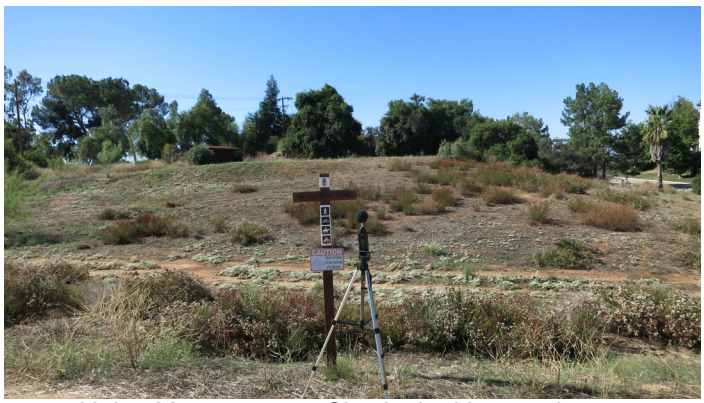
Noise Measurement Site 2 - looking east

Noise Measurement Site 2 - looking southeast

Noise Measurement Site 2 - looking south

Noise Measurement Site 2 - looking southwest

Noise Measurement Site 2 - looking west



Noise Measurement Site 2 - looking northwest

APPENDIX B

Field Noise Measurements Printouts

Measurement Report

Report Summary

Meter's File Name	831_Data.003	Computer's File Name	SLM_0002509_
Meter	831		
Firmware	2.403		
User	GT		Location
Description	Sunset Reservoirs		
Note	SE of Existing Reservoir, approx 40 ft SW of Helen Ct Centerline and 20 ft north of fence for home at 13202 Bruder Ln		
Start Time	2023-08-28 15:25:46	Duration	0:15:00.0
End Time	2023-08-28 15:40:46	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	46.8 dB		
LAE	76.3 dB	SEA	--- dB
EA	4.8 µPa²h		
LZ_{peak}	96.0 dB	2023-08-28 15:25:46	
LAS_{max}	58.8 dB	2023-08-28 15:30:50	
LAS_{min}	43.8 dB	2023-08-28 15:32:52	
LA_{eq}	46.8 dB		
LC_{eq}	59.0 dB	LC_{eq} - LA_{eq}	12.2 dB
LAI_{eq}	49.5 dB	LAI_{eq} - LA_{eq}	2.7 dB

Exceedances	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	46.8 dB	46.8 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	46.8 dB	46.8 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	46.8 dB		59.0 dB		64.0 dB	
$LS_{(max)}$	58.8 dB	2023-08-28 15:30:50	71.5 dB	2023-08-28 15:31:50	87.6 dB	2023-08-28 15:25:47
$LF_{(max)}$	61.9 dB	2023-08-28 15:30:50	73.8 dB	2023-08-28 15:31:50	92.2 dB	2023-08-28 15:25:47
$LI_{(max)}$	68.0 dB	2023-08-28 15:25:46	76.2 dB	2023-08-28 15:30:26	93.7 dB	2023-08-28 15:25:47
$LS_{(min)}$	43.8 dB	2023-08-28 15:32:52	53.4 dB	2023-08-28 15:37:53	54.9 dB	2023-08-28 15:37:53
$LF_{(min)}$	43.2 dB	2023-08-28 15:38:53	52.3 dB	2023-08-28 15:36:35	53.6 dB	2023-08-28 15:28:53
$LI_{(min)}$	43.7 dB	2023-08-28 15:32:52	53.7 dB	2023-08-28 15:37:53	55.4 dB	2023-08-28 15:39:09
$L_{Peak(max)}$	80.9 dB	2023-08-28 15:26:02	86.3 dB	2023-08-28 15:30:26	96.0 dB	2023-08-28 15:25:46

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	51.4 dB
LAS 10.0	48.1 dB
LAS 33.3	45.7 dB
LAS 50.0	45.3 dB
LAS 66.6	45.0 dB
LAS 90.0	44.4 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.004	Computer's File Name	SLM_0002509_831_Data_004.06.ldbin
Meter	831		
Firmware	2.403		
User	GT		Location
Description	Sunset Reservoirs		
Note	North of Existing Reservoir, at Teddy's Trail Trailhead, approx 15 ft north of Helen Ct CL		
Start Time	2023-08-28 15:49:20	Duration	0:15:00.0
End Time	2023-08-28 16:04:20	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	51.3 dB		
LAE	80.8 dB	SEA	--- dB
EA	13.4 µPa²h		
LZ_{peak}	98.5 dB	2023-08-28 15:49:20	
LAS_{max}	73.2 dB	2023-08-28 15:51:26	
LAS_{min}	29.6 dB	2023-08-28 15:57:31	
LA_{eq}	51.3 dB		
LC_{eq}	63.3 dB	LC_{eq} - LA_{eq}	12.0 dB
LAI_{eq}	55.3 dB	LAI_{eq} - LA_{eq}	4.1 dB

Exceedances	Count	Duration
LAS > 65.0 dB	2	0:00:11.3
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	51.3 dB	51.3 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	51.3 dB	51.3 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	51.3 dB		63.3 dB		69.4 dB	
$LS_{(max)}$	73.2 dB	2023-08-28 15:51:26	83.7 dB	2023-08-28 15:51:26	89.3 dB	2023-08-28 15:49:20
$LF_{(max)}$	76.7 dB	2023-08-28 15:51:25	86.3 dB	2023-08-28 15:51:25	93.6 dB	2023-08-28 15:49:20
$LI_{(max)}$	77.8 dB	2023-08-28 15:51:25	87.9 dB	2023-08-28 15:51:25	96.4 dB	2023-08-28 15:49:20
$LS_{(min)}$	29.6 dB	2023-08-28 15:57:31	45.1 dB	2023-08-28 15:58:21	49.6 dB	2023-08-28 16:04:18
$LF_{(min)}$	29.1 dB	2023-08-28 15:57:39	42.6 dB	2023-08-28 15:58:25	46.7 dB	2023-08-28 16:04:06
$LI_{(min)}$	29.6 dB	2023-08-28 15:57:40	45.8 dB	2023-08-28 15:57:38	50.9 dB	2023-08-28 16:02:41
$L_{Peak(max)}$	92.6 dB	2023-08-28 16:02:09	96.1 dB	2023-08-28 15:51:25	98.5 dB	2023-08-28 15:49:20

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	53.5 dB
LAS 10.0	48.0 dB
LAS 33.3	37.0 dB
LAS 50.0	35.4 dB
LAS 66.6	33.3 dB
LAS 90.0	30.8 dB

APPENDIX C

RCNM Model Construction Noise Calculations

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Site Preparation

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to South	Residential	46.8	46.8	46.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	530	0
Dozer	No	40		81.7	530	0
Dozer	No	40		81.7	530	0
Backhoe	No	40		77.6	530	0
Front End Loader	No	40		79.1	530	0
Tractor	No	40	84		530	0
Tractor	No	40	84		530	0

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		61.2	57.2	N/A	N/A	N/A	N/A
Dozer		61.2	57.2	N/A	N/A	N/A	N/A
Dozer		61.2	57.2	N/A	N/A	N/A	N/A
Backhoe		57.1	53.1	N/A	N/A	N/A	N/A
Front End Loader		58.6	54.6	N/A	N/A	N/A	N/A
Tractor		63.5	59.5	N/A	N/A	N/A	N/A
Tractor		63.5	59.5	N/A	N/A	N/A	N/A
	Total	**64**	**66**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Site Preparation

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to Northeast	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	870	0
Dozer	No	40		81.7	870	0
Dozer	No	40		81.7	870	0
Backhoe	No	40		77.6	870	0
Front End Loader	No	40		79.1	870	0
Tractor	No	40	84		870	0
Tractor	No	40	84		870	0

		Calculated (dBA)		Results			
				Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		56.9	52.9	N/A	N/A	N/A	N/A
Dozer		56.9	52.9	N/A	N/A	N/A	N/A
Dozer		56.9	52.9	N/A	N/A	N/A	N/A
Backhoe		52.7	48.8	N/A	N/A	N/A	N/A
Front End Loader		54.3	50.3	N/A	N/A	N/A	N/A
Tractor		59.2	55.2	N/A	N/A	N/A	N/A
Tractor		59.2	55.2	N/A	N/A	N/A	N/A
	Total	**59**	**62**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Site Preparation

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to North	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	840	0
Dozer	No	40		81.7	840	0
Dozer	No	40		81.7	840	0
Backhoe	No	40		77.6	840	0
Front End Loader	No	40		79.1	840	0
Tractor	No	40	84		840	0
Tractor	No	40	84		840	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		57.2	53.2	N/A	N/A	N/A	N/A
Dozer		57.2	53.2	N/A	N/A	N/A	N/A
Dozer		57.2	53.2	N/A	N/A	N/A	N/A
Backhoe		53.1	49.1	N/A	N/A	N/A	N/A
Front End Loader		54.6	50.6	N/A	N/A	N/A	N/A
Tractor		59.5	55.5	N/A	N/A	N/A	N/A
Tractor		59.5	55.5	N/A	N/A	N/A	N/A
	Total	**60**	**62**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Home to South	Residential	46.8	46.8	46.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	530	0
Grader	No	40	85		530	0
Dozer	No	40		81.7	530	0
Backhoe	No	40		77.6	530	0
Front End Loader	No	40		79.1	530	0
Tractor	No	40	84		530	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Excavator	60.2	56.2	N/A	N/A	N/A	N/A
Grader	64.5	60.5	N/A	N/A	N/A	N/A
Dozer	61.2	57.2	N/A	N/A	N/A	N/A
Backhoe	57.1	53.1	N/A	N/A	N/A	N/A
Front End Loader	58.6	54.6	N/A	N/A	N/A	N/A
Tractor	63.5	59.5	N/A	N/A	N/A	N/A
Total	**65**	**65**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Grading

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to Northeast	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	870	0
Grader	No	40	85		870	0
Dozer	No	40		81.7	870	0
Backhoe	No	40		77.6	870	0
Front End Loader	No	40		79.1	870	0
Tractor	No	40	84		870	0

		Calculated (dBA)		Results Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		55.9	51.9	N/A	N/A	N/A	N/A
Grader		60.2	56.2	N/A	N/A	N/A	N/A
Dozer		56.9	52.9	N/A	N/A	N/A	N/A
Backhoe		52.7	48.8	N/A	N/A	N/A	N/A
Front End Loader		54.3	50.3	N/A	N/A	N/A	N/A
Tractor		59.2	55.2	N/A	N/A	N/A	N/A
	Total	**60**	**61**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Grading

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to North	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	840	0
Grader	No	40	85		840	0
Dozer	No	40		81.7	840	0
Backhoe	No	40		77.6	840	0
Front End Loader	No	40		79.1	840	0
Tractor	No	40	84		840	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		56.2	52.2	N/A	N/A	N/A	N/A
Grader		60.5	56.5	N/A	N/A	N/A	N/A
Dozer		57.2	53.2	N/A	N/A	N/A	N/A
Backhoe		53.1	49.1	N/A	N/A	N/A	N/A
Front End Loader		54.6	50.6	N/A	N/A	N/A	N/A
Tractor		59.5	55.5	N/A	N/A	N/A	N/A
	Total	**61**	**61**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Home to South	Residential	46.8	46.8	46.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	530	0
Gradall	No	40		83.4	530	0
Gradall	No	40		83.4	530	0
Gradall	No	40		83.4	530	0
Generator	No	50		80.6	530	0
Backhoe	No	40		77.6	530	0
Front End Loader	No	40		79.1	530	0
Welder / Torch	No	40		74	530	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane		60	52.1	N/A	N/A	N/A	N/A
Gradall		62.9	58.9	N/A	N/A	N/A	N/A
Gradall		62.9	58.9	N/A	N/A	N/A	N/A
Gradall		62.9	58.9	N/A	N/A	N/A	N/A
Generator		60.1	57.1	N/A	N/A	N/A	N/A
Backhoe		57.1	53.1	N/A	N/A	N/A	N/A
Front End Loader		58.6	54.6	N/A	N/A	N/A	N/A
Welder / Torch		53.5	49.5	N/A	N/A	N/A	N/A
	Total	**63**	**66**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Building Construction

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to Northeast	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	870	0
Gradall	No	40		83.4	870	0
Gradall	No	40		83.4	870	0
Gradall	No	40		83.4	870	0
Generator	No	50		80.6	870	0
Backhoe	No	40		77.6	870	0
Front End Loader	No	40		79.1	870	0
Welder / Torch	No	40		74	870	0

		Calculated (dBA)		Results Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		55.7	47.8	N/A	N/A	N/A	N/A
Gradall		58.6	54.6	N/A	N/A	N/A	N/A
Gradall		58.6	54.6	N/A	N/A	N/A	N/A
Gradall		58.6	54.6	N/A	N/A	N/A	N/A
Generator		55.8	52.8	N/A	N/A	N/A	N/A
Backhoe		52.7	48.8	N/A	N/A	N/A	N/A
Front End Loader		54.3	50.3	N/A	N/A	N/A	N/A
Welder / Torch		49.2	45.2	N/A	N/A	N/A	N/A
	Total	**59**	**61**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Building Construction

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to North	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	840	0
Gradall	No	40		83.4	840	0
Gradall	No	40		83.4	840	0
Gradall	No	40		83.4	840	0
Generator	No	50		80.6	840	0
Backhoe	No	40		77.6	840	0
Front End Loader	No	40		79.1	840	0
Welder / Torch	No	40		74	840	0

		Calculated (dBA)		Results			
				Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		56.0	48.1	N/A	N/A	N/A	N/A
Gradall		58.9	54.9	N/A	N/A	N/A	N/A
Gradall		58.9	54.9	N/A	N/A	N/A	N/A
Gradall		58.9	54.9	N/A	N/A	N/A	N/A
Generator		56.1	53.1	N/A	N/A	N/A	N/A
Backhoe		53.1	49.1	N/A	N/A	N/A	N/A
Front End Loader		54.6	50.6	N/A	N/A	N/A	N/A
Welder / Torch		49.5	45.5	N/A	N/A	N/A	N/A
	Total	**59**	**62**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Home to South	Residential	46.8	46.8	46.8

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	530	0
Paver	No	50		77.2	530	0
Paver	No	50		77.2	530	0
Paver	No	50		77.2	530	0
Roller	No	20		80	530	0
Roller	No	20		80	530	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Paver		56.7	53.7	N/A	N/A	N/A	N/A
Paver		56.7	53.7	N/A	N/A	N/A	N/A
Paver		56.7	53.7	N/A	N/A	N/A	N/A
Paver		56.7	53.7	N/A	N/A	N/A	N/A
Roller		59.5	52.5	N/A	N/A	N/A	N/A
Roller		59.5	52.5	N/A	N/A	N/A	N/A
	Total	**60**	**61**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Paving

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Home to Northeast	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	870	0
Paver	No	50		77.2	870	0
Paver	No	50		77.2	870	0
Paver	No	50		77.2	870	0
Roller	No	20		80	870	0
Roller	No	20		80	870	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		52.4	49.4	N/A	N/A	N/A	N/A
Paver		52.4	49.4	N/A	N/A	N/A	N/A
Paver		52.4	49.4	N/A	N/A	N/A	N/A
Paver		52.4	49.4	N/A	N/A	N/A	N/A
Roller		55.2	48.2	N/A	N/A	N/A	N/A
Roller		55.2	48.2	N/A	N/A	N/A	N/A
	Total	**55**	**57**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Paving

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Home to North	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	840	0
Paver	No	50		77.2	840	0
Paver	No	50		77.2	840	0
Paver	No	50		77.2	840	0
Roller	No	20		80	840	0
Roller	No	20		80	840	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Paver		52.7	49.7	N/A	N/A	N/A	N/A
Paver		52.7	49.7	N/A	N/A	N/A	N/A
Paver		52.7	49.7	N/A	N/A	N/A	N/A
Paver		52.7	49.7	N/A	N/A	N/A	N/A
Roller		55.5	48.5	N/A	N/A	N/A	N/A
Roller		55.5	48.5	N/A	N/A	N/A	N/A
	Total	**56**	**57**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Painting

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to South	Residential	46.8	46.8	46.8

			Equipment Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	530	0

Results

	Calculated (dBA)		Day		Evening	
			Noise Limits (dBA)			
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	57.2	53.2	N/A	N/A	N/A	N/A
Total	**57**	**53**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to Northeast	Residential	51.3	51.3	51.3

			Equipment Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	870	0

Results

	Calculated (dBA)		Day		Evening	
			Noise Limits (dBA)			
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	52.9	48.9	N/A	N/A	N/A	N/A
Total	**53**	**49**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/3/2023
Case Description: Sunset Reservoirs - Painting

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Home to North	Residential	51.3	51.3	51.3

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	840	0

		Calculated (dBA)		Results	Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		53.2	49.2	N/A	N/A	N/A	N/A
	Total	**53**	**49**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.