Replenish Big Bear

NOISE IMPACT ANALYSIS

COUNTY OF SAN BERNARDINO

PREPARED BY:

William Maddux
bmaddux@urbanxroads.com
(619) 778-1971

OCTOBER 2, 2023

TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

•	Reference
ANSI	American National Standards Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OSHA	Occupational Safety and Health Administration
PPV	Peak Particle Velocity
Project	Replenish Big Bear
RMS	Root-mean-square
VdB	Vibration Decibels

This page intentionally left blank

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this construction noise study to determine the potential noise impacts due to the proposed Replenish Big Bear development ("Project"). The Project site is located within the Big Bear Valley Groundwater Management Zone (GMZ or Basin). Big Bear Lake and Baldwin Lake are located in the middle of this Basin. The overall Project area consists of the Valley, in the County of San Bernardino. The Project is not noise sensitive and would not be impacted by aircraft noise. Therefore, the focus of this analysis is on the potential construction related noise and vibration impacts. This noise study has been prepared to satisfy applicable County of San Bernardino construction noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Replenish Big Bear Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact with applicable Project standard practices described in this study.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	6	*Less Than Significant*	-
Operational Noise	7	*Less Than Significant*	-
Construction Noise	8	*Significant*	*Less Than Significant*
Construction Vibration		*Less Than Significant*	-

This page intentionally left blank

1 INTRODUCTION

This noise analysis has been completed to determine the construction noise impacts associated with the development of the proposed Replenish Big Bear ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Project site is located within the Big Bear Valley Groundwater Management Zone (GMZ or Basin). Big Bear Lake and Baldwin Lake are located in the middle of this Basin. The overall Project area consists of the Valley, in the County of San Bernardino as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The proposed Project includes upgrades and additions to Big Bear Area Regional Wastewater Agency's (BBARWA) wastewater treatment plant (WWTP) to produce purified water through full advanced treatment to protect the receiving waters and their beneficial uses. The Replenish Big Bear Program would upgrade BBARWA's WWTP to produce full advanced treated water that would be retained within the Big Bear Valley watershed to be used to increase the sustainability of local water supplies, consequently, wastewater currently delivered to Lucerne Valley will be modified. The proposed Project consists of construction and operation of the various facilities which are separated into five project categories: 1) Replenish Big Bear Component 1: Lake Discharge Pipeline Alignment; 2) Replenish Big Bear Component 2: Shay Pond; 3) Replenish Big Bear Component 3: Evaporation Pond; 4) Replenish Big Bear Component 4: BBARWA WWTP Upgrades; and 5) Replenish Big Bear Component 5: Sand Canyon.

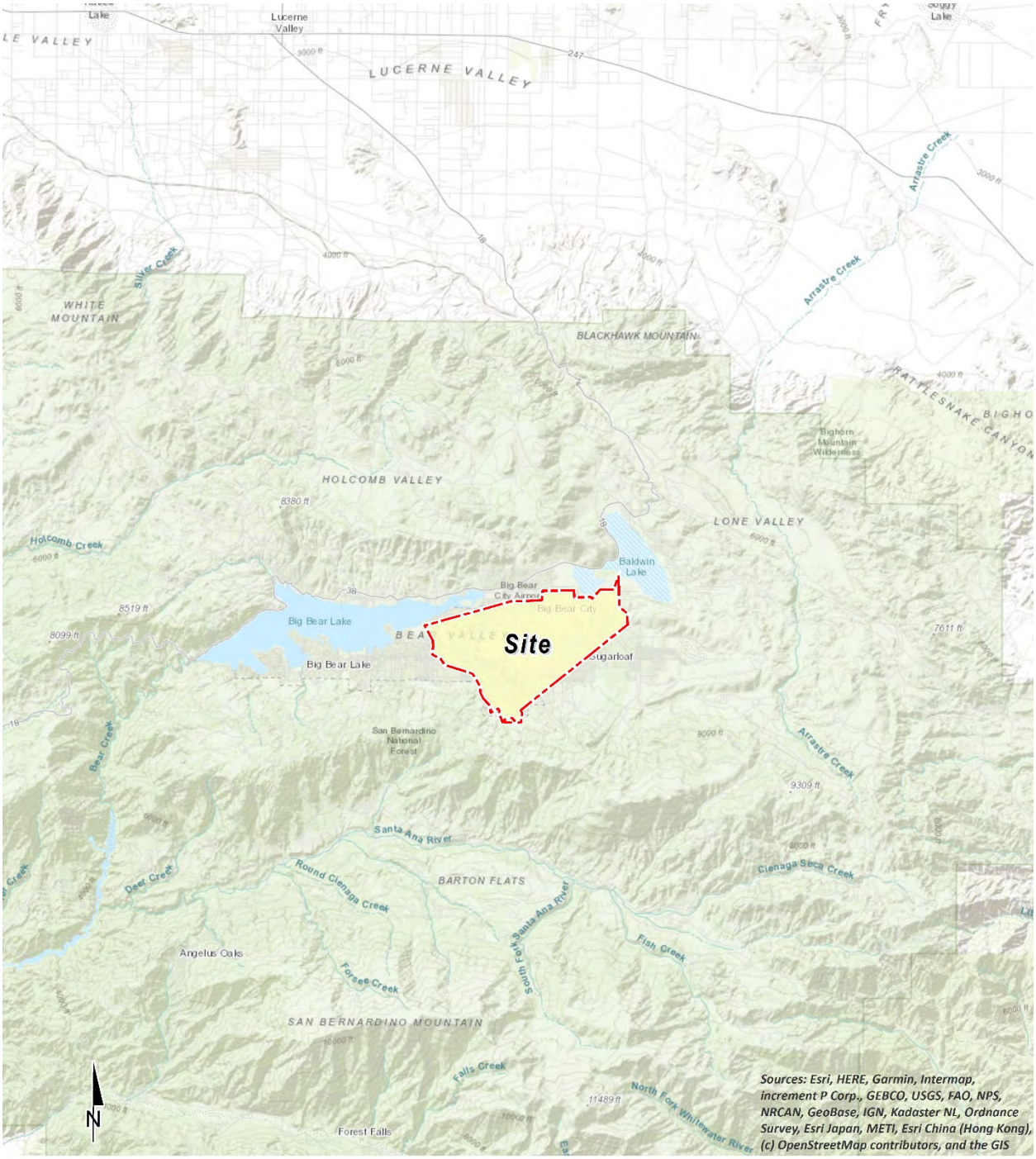
REPLENISH BIG BEAR COMPONENT 1: BBARWA WWTP UPGRADES

This Replenish Big Bear Component includes upgrades to the BBARWA WWTP, to include 2.2 MGD of full advanced treatment, producing up to 2,210 AFY of purified water. The upgrades include the construction of a 40,000 SF building which would provide the following upgrades and new construction in order of process flow:

- Upgrades to the Oxidation Ditches
- New Denitrification Filter
- New UF and RO filtration membranes
- New UV Disinfection
- New AOP
- New Pellet Reactor: 0.22 MGD

The BBARWA WWTP Treatment Upgrades also includes the installation of about 1,350 LF of brine pipeline anticipated to be sized between 8" to 10" from the pellet reactor to the solar evaporation ponds. Additionally, the BBARWA WWTP Treatment Upgrades also includes installation of a 50 gpm brine pump station and a 1,520 gpm pump station at the BBARWA WWTP to pump purified water to Shay Pond and Stanfield Marsh.

EXHIBIT 1-A: LOCATION MAP



REPLENISH BIG BEAR COMPONENT 2: LAKE DISCHARGE PIPELINE ALIGNMENT

The Replenish Big Bear Program would ultimately install a pipeline utilizing one of three alignments from the WWTP to Stanfield Marsh in the amount of about 19,940 LF sized at 12" in diameter.

REPLENISH BIG BEAR COMPONENT 3: SHAY POND

The Replenish Big Bear Program would ultimately install about 710 LF of 4" pipeline to reach Shay Pond from either an existing pipeline or a new 6" pipeline that would be 5,600 LF. As such, this Replenish Big Bear Component includes the installation of up to 6,310 LF of conveyance pipeline.

REPLENISH BIG BEAR COMPONENT 4: EVAPORATION POND

The Replenish Big Bear Program would include between 23 and 57 acres of evaporation ponds at the BBARWA WWTP site. The ponds would be segmented into different storage basins to allow for evaporation of the brine stream in a cycle of filling with brine, allowing the brine to evaporate, and then removing remaining brine. This Replenish Big Bear Component includes the installation of up to 2 monitoring wells..

REPLENISH BIG BEAR COMPONENT 5: SAND CANYON

The Sand Canyon groundwater recharge project involves extracting Project water stored in the Lake to a temporary storage pond using existing infrastructure owned by a local resort. The Project water will then be pumped and conveyed to the Sand Canyon recharge area using a new pump station and pipeline.

As part of the Replenish Big Bear Program, the following will be constructed:

- A new 471 gpm pump station near the snowmaking pond, at the BBLDWP Sand Canyon Well site, to convey water to Sand Canyon.
- A new 8-inch pipeline that will discharge into Sand Canyon and will be approximately 7,200 feet in length.
- Two monitoring wells for groundwater recharge at Sand Canyon, as required by the future discharge permit.
- Installation of erosion control using rip rap or similar erosion control methods, at Sand Canyon.

This page intentionally left blank

2 FUNDAMENTALS

Noise is simply 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. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to 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. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). 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 (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period (typically one hour) and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Day-Night Average Noise Level (LDN) and the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The LDN and CNEL are weighted averages of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The LDN time of day corrections include the addition of 10 decibels to dBA Leq sound levels at night between 10:00 p.m. and 7:00 a.m. The CNEL time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., in addition to the corrections for the LDN. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. LDN and CNEL do not represent the actual sound level heard at any time, but rather represent the total sound exposure. The County of San Bernardino relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation

associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (2)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an “out of sight, out of mind” effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (4)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (4)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (5)

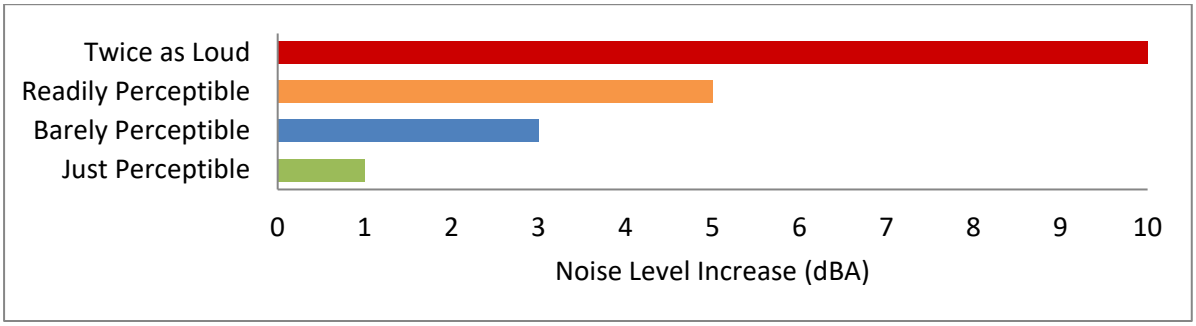
2.7 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (7). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (7). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structurers reduce vibration levels due to the coupling of the building to the soil.

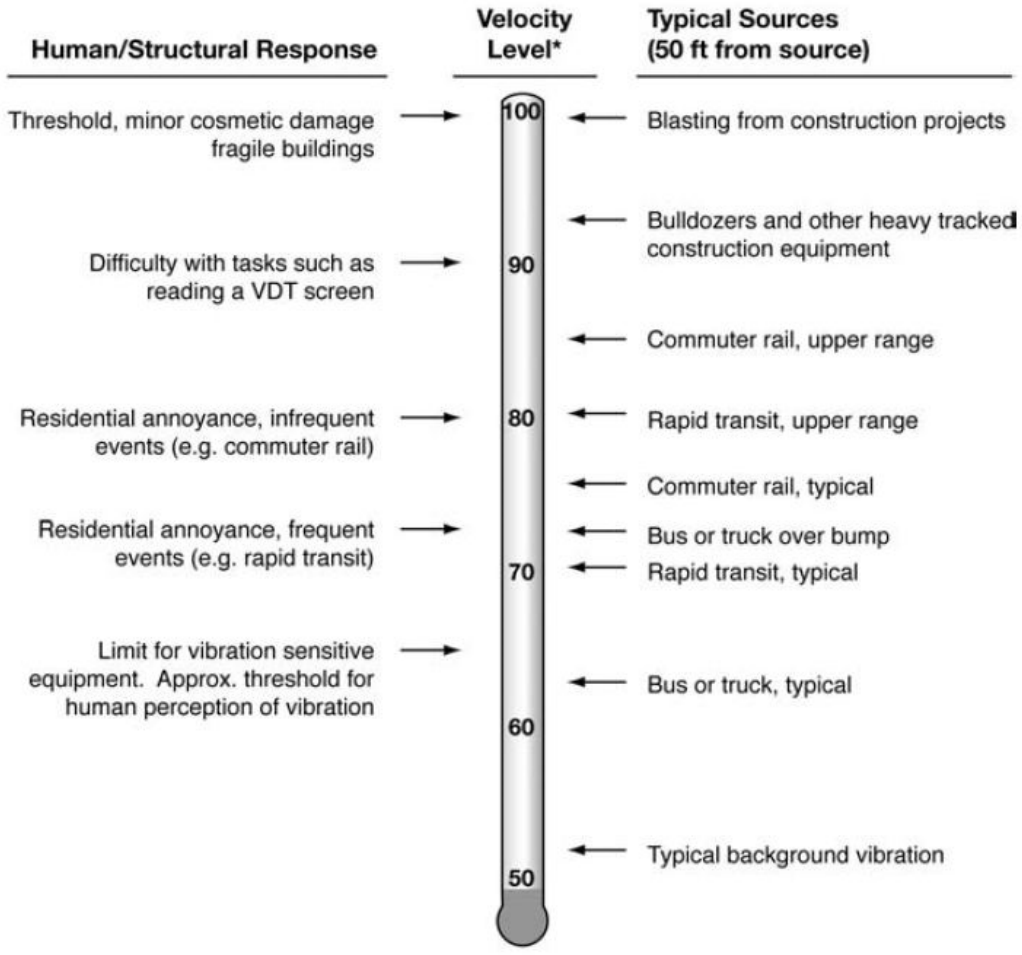
There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal (7). The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body (7). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (8). Thus, either can be used on the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide

a background of common vibration levels and set vibration limits (9). Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels.

As stated in the FTA guidance manual, the background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual.

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 BIG BEAR AREA REGIONAL WASTEWATER AGENCY'S

The BBARWA does not have specific noise ordinances or standards and while the BBARWA is not subject to local noise standards under CEQA, for purposes of this project the BBAQWA considers the County of San Bernardino noise standards in the determination of impacts. The County noise standards and ordinances are summarized in the following discussion.

3.2 COUNTY OF SAN BERNARDINO COUNTYWIDE PLAN

The County of San Bernardino has adopted a Countywide Plan Hazards Element, in part, to limit the exposure of the community to excessive noise levels. In most cases, no single goal, policy, or implementation program is expected to completely avoid or reduce an identified potential environmental impact. However, the collective, cumulative mitigating benefits of the polices listed below are intended to reduce noise-related impacts. Specific goals and policies are discussed in Section 5.12.4, Environmental Impacts, to demonstrate how the policy would avoid or reduce the impact. (11)

HZ-2 Human Generated Hazards: People and the natural environment protected from exposure to hazardous materials, excessive noise, and other human-generated hazards.

HZ-2.6 Coordination with Transportation Authorities: We collaborate with airport owners, FAA, Caltrans, SBCTA, SCAG, neighboring jurisdictions, and other transportation providers in the preparation and maintenance of, and updates to transportation-related plans and projects to minimize noise impacts and provide appropriate mitigation measures.

HZ-2.7 Truck Delivery Areas: We encourage truck delivery areas to be located away from residential properties and require associated noise impacts to be mitigated.

HZ-2.8 Proximity to Noise Generating Uses: We limit to restrict new noise sensitive land uses in proximity to existing conforming noise generating uses and planned industrial areas.

HZ-2.9 Control Sound at the Source: We prioritize noise mitigation measures that control sound at the source before buffers, soundwalls and other perimeter measures.

HZ-2.10 Agricultural Operations: We require new development adjacent to existing conforming agricultural operations to provide adequate buffers to reduce the exposure of new development to operational noise, odor, and the storage or application of pesticides or other hazardous materials.

3.3 COUNTY OF SAN BERNARDINO DEVELOPMENT CODE

While the County of San Bernardino Hazards Element provides guidelines and criteria to assess transportation noise on sensitive land uses, the County Code, Title 8 Development Code contains the noise level limits for mobile, stationary, and construction-related noise sources. (12)

3.3.1 TRANSPORTATION NOISE STANDARDS

Section 83.01.080(d), Table 83-3, contains the County of San Bernardino's mobile noise source-related standards, shown on Exhibit 3-A. Based on the County's mobile noise source standards, there are no exterior noise level standards for the Project commercial land use. Exterior transportation (mobile) noise level standards for residential land uses in the Project study area are shown to be 60 dBA CNEL, while non-noise-sensitive land uses, such as office uses, require exterior noise levels of 65 dBA CNEL per the County's Table 83-3 mobile noise source standards.

EXHIBIT 3-A: COUNTY OF SAN BERNARDINO MOBILE NOISE LEVEL STANDARDS

Noise Standards for Adjacent Mobile Noise Sources			
Land Use		*Ldn (or CNEL) dB(A)*	
Categories	*Uses*	*Interior (1)*	*Exterior (2)*
Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

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

Source: County of San Bernardino County Code, Title 8 Development Code, Table 83-3.

3.3.2 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Replenish Big Bear Project, stationary-source (operational) noise such as the expected pumps, compressors, and the drilling rig are typically evaluated against standards established under a jurisdiction's Municipal Code. The County of San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) establishes the noise level standards for stationary noise sources. Since the Project's land use will potentially impact adjacent noise-sensitive uses in the Project study area, this noise study relies on the more conservative residential noise level standards to describe potential operational noise impacts.

For residential properties, the exterior noise level shall not exceed 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. (12) The exterior noise level standards shall apply for a cumulative period of 30 minutes in any hour, as well as the standard plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the

standard plus 20 dBA for any period of time. Further, Section 83.01.080(e) indicates that if the existing ambient noise level already exceeds any of the exterior noise level limit categories, then the standard shall be adjusted to reflect the ambient conditions. The County of San Bernardino operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS

Affected Land Uses (Receiving Noise)	7:00 a.m. - 10:00 p.m. (dBA L_{eq})	10:00 p.m. - 7:00 a.m. (dBA L_{eq})
Residential	55	45
Professional Services	55	55
Other Commercial	60	60
Industrial	70	70

L_{eq} = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.
dB(A) = (A-weighted Sound Pressure Level). 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, placing greater emphasis on those frequencies within the sensitivity range of the human ear.

The percentile noise descriptors are provided to ensure that the duration of the noise source is fully considered. However, due to the relatively constant intensity of the Project operational activities, the L_{50} or average L_{eq} noise level metrics best describe the pumps, compressors, and the drilling rig. In addition, the L_{eq} noise level metric accounts for noise fluctuations over time by averaging the louder and quieter events and giving more weight to the louder events. In addition, due to the mathematical relationship between the median (L_{50}) and the mean (L_{eq}), the L_{eq} will always be larger than or equal to the L_{50}. The more variable the noise becomes, the larger the L_{eq} becomes in comparison to the L_{50}. Therefore, this noise study conservatively relies on the average L_{eq} sound level limits to describe the Project operational noise levels.

3.4 CONSTRUCTION NOISE STANDARDS

Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00 a.m. to 7:00 p.m. except on Sundays and Federal holidays. (12) However, neither the County of San Bernardino General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise

environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a threshold for noise sensitive residential land use, a noise level of 85 dBA L_{eq} for commercial locations, and 90 dBA L_{eq} for industrial locations. (7)

3.5 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (7)

The County of San Bernardino Development Code, Section 83.01.090(a) states that vibration shall be no *greater than or equal to two-tenths inches per second measured at or beyond the lot line*. (12) Therefore, to determine if the vibration levels due to the operation and construction of the Project, the peak particle velocity (PPV) vibration level standard of 0.2 inches per second is used.

This page intentionally left blank

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (13) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

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

While the County of San Bernardino General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility..

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is located adjacent Big Bear Airport and one option would locate a pipeline within the Big Bear Airport. However, the project would not erect any structures near the airport and would not locate any incompatible land uses within the airport influence area (14). The Project is a water infrastructure development and would not place people within the airport land use plan area. As such, the Project site would not be exposed to excessive noise levels from airport operations and would not conflict with the airport land use plan, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guideline C.

The Project site will not include any residential or commercial office space and thus does not conflict with any interior noise level requirements. Similarly, the project would not result in substantial new trips on local roadways, rather future maintenance activities at new facilities would be carried out by the existing maintenance crews and the BBARWA WWTP upgrades would not require substantial new staff. Therefore, the Project would not result in a substantial off-site traffic increase.

4.2 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	**Nighttime**
Construction	Noise-Sensitive	Permitted between 7:00 a.m. to 7:00 p.m.; except Sundays and Federal holidays.[3]		
		Noise Level Threshold[1]	80 dBA L_{eq}	n/a
		Vibration Level Threshold[4]	0.2 PPV in/sec	n/a

[1] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[2] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1)
[3] Section 83.01.080(g)(3) of the County of San Bernardino County Code.
[4] Section 83.01.090(a) of the County of San Bernardino County Code.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m. "n/a" = construction activities are not planned during the nighttime hours; "PPV" = peak particle velocity.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at six locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibits 5-A and 5-B provide the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, July 12, 2023. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the equivalent daytime and nighttime hourly noise levels. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (15)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (16)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (16) Collecting reference ambient noise level measurements at the nearest sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS 1 TO 3

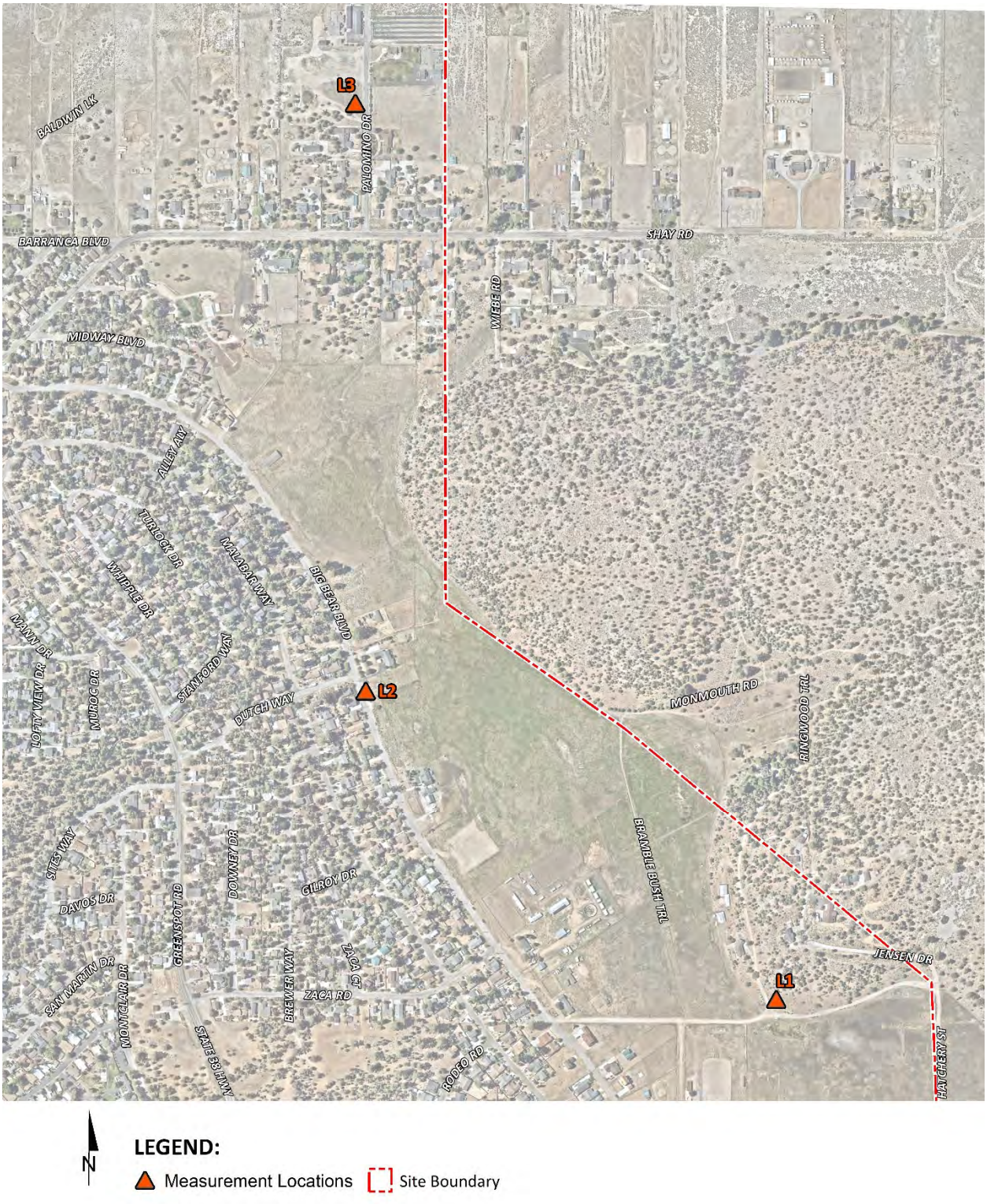


EXHIBIT 5-B: NOISE MEASUREMENT LOCATIONS 4 TO 6

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location during typical weekday Friday conditions and weekend Saturday conditions. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Northwest of Shay Pond near 2025 Garnet Street	46.7	42.7
L2	Located near 1485 E Big Bear Blvd	51.6	43.0
L3	Located near 109 Palomino Drive	46.9	44.3
L4	Located near 1467 Lassen Drive	42.1	46.9
L5	Located near 43652 Sand Canyon Road	48.3	38.3
L6	Located near 43485 Colusa Drive	42.9	40.5

[1] See Exhibit 5-A and B for the noise level measurement locations.
[2] Energy (logarithmic) equivalent levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 8:00 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:59 a.m.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods. The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with surface streets.

6 RECEIVER LOCATIONS

To assess the potential for operational and construction noise impacts, the following receiver locations, as shown on Exhibit 6-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. The County of San Bernardino General Plan Noise Element defines noise-sensitive uses as residences, hospitals, convalescent and day care facilities, schools, and libraries. (17) Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, seven receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards), Project boundary line, or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the backyard of existing noise sensitive residence located at 109 Palomino Drive located south of the BBARWA WWTP. R1 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L3, to describe existing ambient noise level.

R2: Location R2 represents the backyard existing noise sensitive residence located at 116 Palomino Drive, south of the BBARWA WWTP. R2 is placed in the private outdoor living areas (backyard) facing the Project site.

R3: Location R3 represents an existing noise sensitive residence located at 1458 Shay Road. This residence is located east of the Shay Pond Pipeline alignment. Since there are no private outdoor living areas (e.g. backyards) facing the Project site, receiver R3 is placed at the building façade.

R4: Location R4 represents an existing noise sensitive residence located at 1485 E Big Bear Boulevard west of the Shay Pond Pipeline alignment. R4 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe existing ambient noise level.

R5: Location R5 represents an existing noise sensitive residence located at 2025 Garnet Street east of the Shay Pond Pipeline alignment and west of Shay Pond. Receiver R5 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe existing ambient noise level.

R6: Location R6 represents an existing noise sensitive residence located at 1467 Lassen Drive northeast of the Sand Canyon Conveyance Pipeline and Pump Station of the Project site. Receiver R6 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe existing ambient noise level.

R7: Location R7 represents an existing noise sensitive residence located at 43861 Mendocino Drive northeast of the Sand Canyon Recharge Area. Receiver R7 is placed in the private outdoor living areas (backyard) facing the Project site.

R8: Location R8 represents an existing noise sensitive residence located at 43817 Sand Canyon Road southwest of the Sand Canyon Recharge Area. Receiver R8 is placed in the private outdoor living areas facing the Project site.

R9: Location R9 represents an existing noise sensitive residence located at 43652 Sand Canyon Road south of the Sand Canyon Recharge Area. Receiver R9 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe existing ambient noise level.

R10: Location R10 represents an existing noise sensitive residence located at 43485 Colusa Drive northeast of the Sand Canyon Recharge Area. Receiver R10 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L6, to describe existing ambient noise level.

Pipeline Receivers: Receivers located along pipeline routes occur along nearly all off-site pipeline alignments. For purposes of analysis, and based on a survey of project alignments, the majority of roadways and potential rights-of-way are the width of 2 lane roadways (approximately 24 feet), thus receivers (e.g. residential buildings) are evaluated as close as 20 feet from the centerline of the pipeline construction activities.

EXHIBIT 6-A: BBARWA WWTP, SHAY POND, AND PIPELINE RECEIVER LOCATIONS

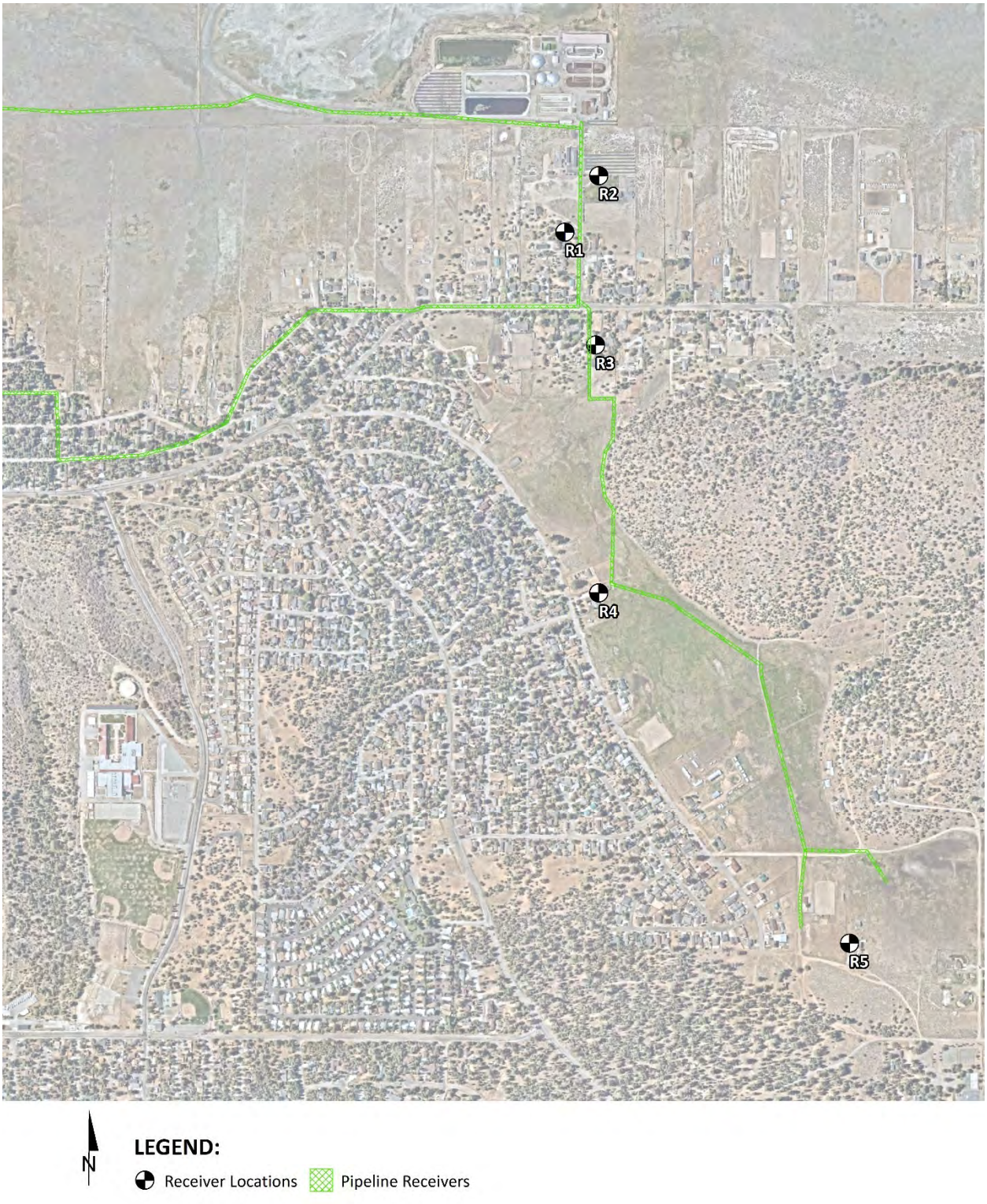


EXHIBIT 6-B: PIPELINE RECEIVER LOCATIONS - EAST

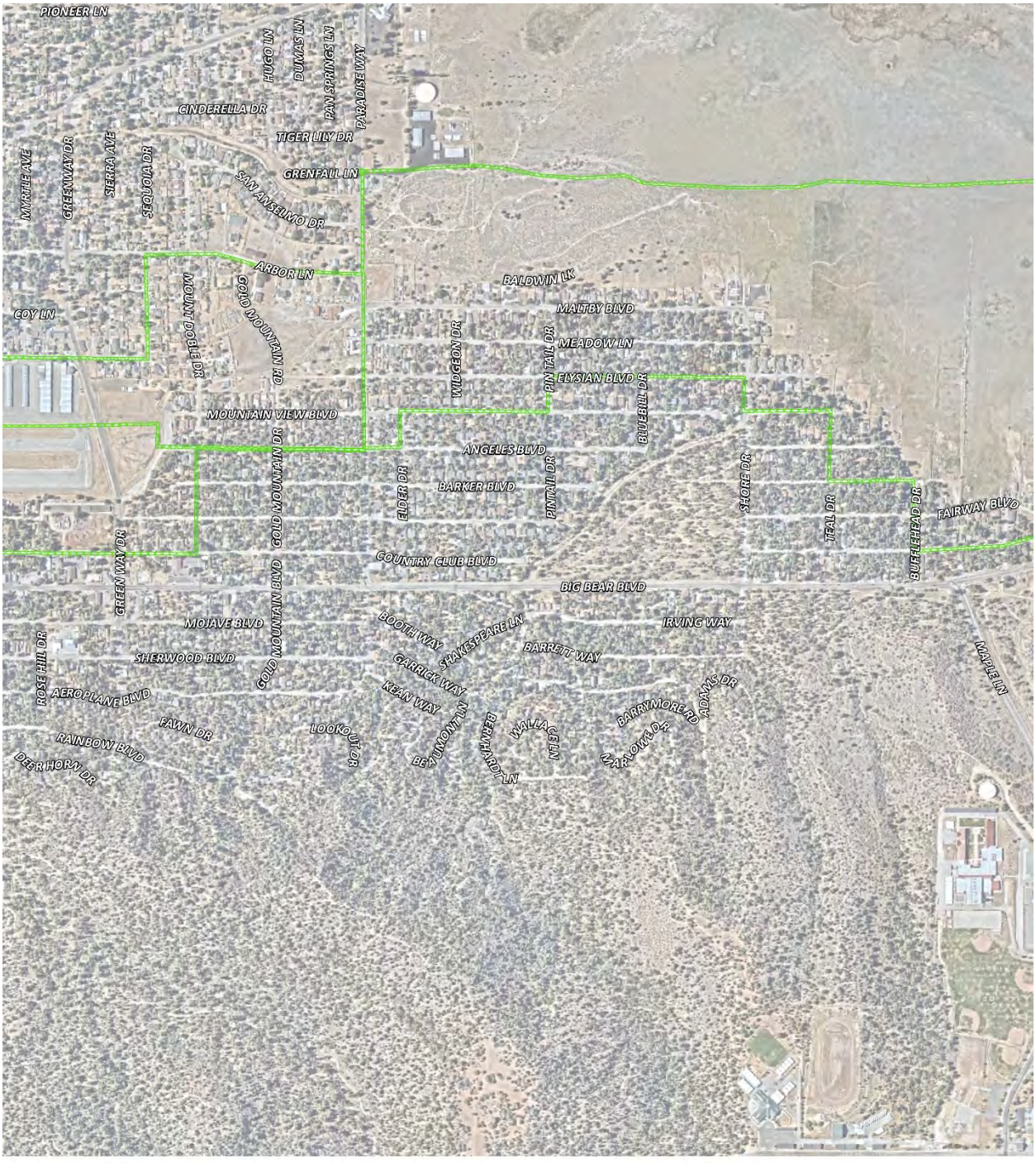


EXHIBIT 6-C: PIPELINE RECEIVER LOCATIONS - WEST

EXHIBIT 6-D: SAND CANYON RECEIVER LOCATIONS

7 OPERATIONAL NOISE IMPACTS

The Project will include several improvements at the BBARWA WWTP, however, all new noise sources would be housed inside the new building and the two pumps at the BBARWA WWTP would be housed in concrete masonry unit (CMU) buildings. Similarly, the proposed Sand Canyon pump station would be housed in a CMU building. The proposed structures would achieve between 40 and 50 dBA in noise reduction from pump noise to exterior locations. The proposed pumps are anticipated to generate up to 60 dBA at 32 feet. Based on the anticipated reduction, pump noise would be 30 dBA L_{eq} less outside the building. Therefore, operational noise sources would be well controlled and are not anticipated to result in substantial noise level increases.

This page intentionally left blank

8 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the construction noise and vibration activities associated with the development of the Project.

8.1 CONSTRUCTION NOISE SOURCES

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The Project is construction noise sources are expected to include a combination of loaders, cranes, welders, drill rigs, diesel generators, concrete pumps and mixture of other construction equipment.

As discussed under the Project description, Project construction activities are expected to occur in the following phases:

- Component 1: BBARWA WWTP Upgrades
- Component 2: Lake Discharge Pipeline Alignment
- Component 3: Shay Pond Conveyance Pipeline
- Component 4: Evaporation Pond
- Component 5: Sand Canyon

BBARWA WWTP UPGRADES

The upgrades include the construction of a 40,000 SF building, upgrades to the oxidation ditches, a denitrification filter, ultrafiltration (UF) and reverse osmosis (RO) filtration membranes, ultraviolet disinfection with advanced oxidation process (UV -AOP), and a 0.22 million gallons per day (MGD) Pellet Reactor. The BBARWA WWTP Treatment Upgrades includes the installation of about 1,350 linear feet (LF) of brine pipeline anticipated to be sized between 8” to 10” from the pellet reactor to the solar evaporation ponds within the existing facility boundaries.

Additionally, the BBARWA WWTP Treatment Upgrades include the installation of a 50 gallon per minute (gpm) brine pump station and a 1,520 gpm pump station at the BBARWA WWTP to pump purified water to Shay Pond and Stanfield Marsh.

Construction of the BBARWA WWTP Upgrades would include typical demolition, site preparation, grading, building construction, and architectural coatings activities. It is anticipated that BBARWA WWTP Upgrades could be constructed while the evaporation ponds are being constructed and have been modeled as simultaneous construction. Exhibit 8-A shows the construction noise source locations and receiver locations used to assess the construction noise levels from the BBARWA WWTP Upgrades.

EXHIBIT 8-A: BBARWA WWTP AND EVAPORATION POND CONSTRUCTION NOISE SOURCES AND RECEIVER LOCATIONS

LAKE DISCHARGE PIPELINE ALIGNMENT

The Replenish Big Bear Program would ultimately install a pipeline utilizing one of three alignments from the WWTP to Stanfield Marsh in the amount of about 19,940 LF sized at 12" in diameter. Construction of the Lake Discharge Pipelines would include roadway demolition, pipeline installation, roadbed backfilling, grading, and paving activities. It is anticipated that Lake Discharge Pipelines would be constructed with multiple teams, however, pipeline construction would not physically overlap, rather improvements would occur in multiple locations along the alignment and represent individual events at multiple locations. For locations within existing paved right-of-way, pipeline construction is anticipated to extend 200-300 LF per day, while construction along unpaved areas would extend 400-500 LF per day. Pipeline construction is modeled as a single 200 foot long moving point source along the alignment

Receiver locations used to assess the construction noise levels from the Lake Discharge Pipelines component would occur at various locations all along the pipeline alignment, with receivers as close as 30 feet from potential construction locations. The potential pipeline alignments are Shown in Exhibit 8-B. Receivers are assumed to occur approximately 30 feet from the center of all alignments in public rights-of-way.

SHAY POND CONVEYANCE PIPELINE

The Replenish Big Bear Program would ultimately install about 710 LF of 4" pipeline to reach Shay Pond from either an existing pipeline or a new 6" pipeline that would be 5,600 LF. As such, this Replenish Big Bear Component includes the installation of up to 6,310 LF of conveyance pipeline.

Construction of the Shay Pond Conveyance Pipeline and monitoring wells would include roadway demolition, pipeline installation, backfilling, and grading, activities along Shay Road. It is anticipated that Shay Pond Conveyance Pipeline would be constructed with multiple teams. Construction along unpaved areas pipeline construction activities would extend 400-500 LF per day. Exhibit 8-C shows the construction noise source locations and receiver locations used to assess the construction noise levels from the Shay Pond Conveyance Pipeline.

EVAPORATION POND

The Replenish Big Bear Program would include between 23 and 57 acres of evaporation ponds at the BBARWA WWTP site. The ponds would be segmented into different storage basins to allow for evaporation of the brine stream in a cycle of filling with brine, allowing the brine to evaporate, and then removing remaining brine. This Replenish Big Bear Component includes the installation of up to 2 monitoring wells.

EXHIBIT 8-B: LAKE DISCHARGE PIPELINE CONSTRUCTION NOISE SOURCES

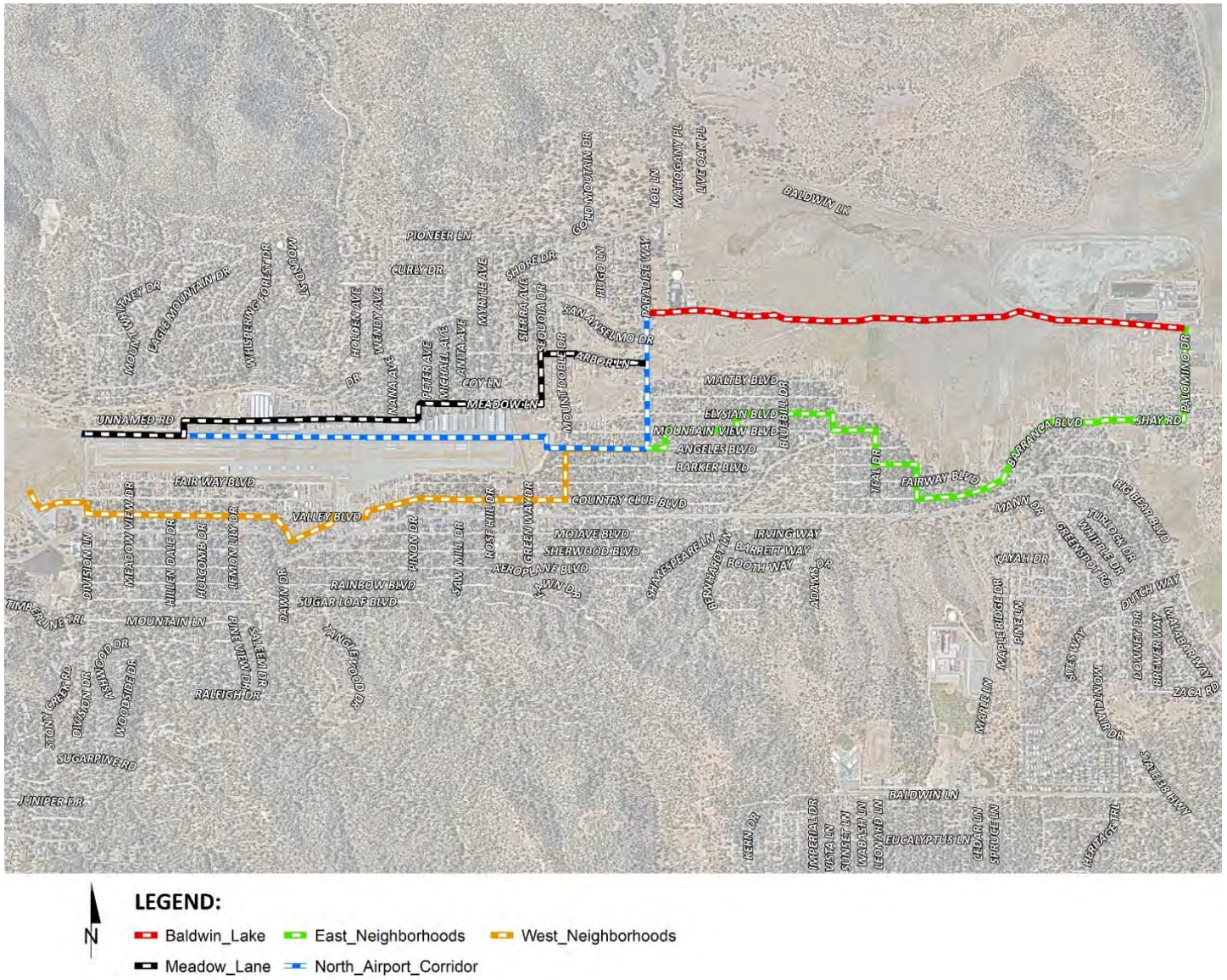
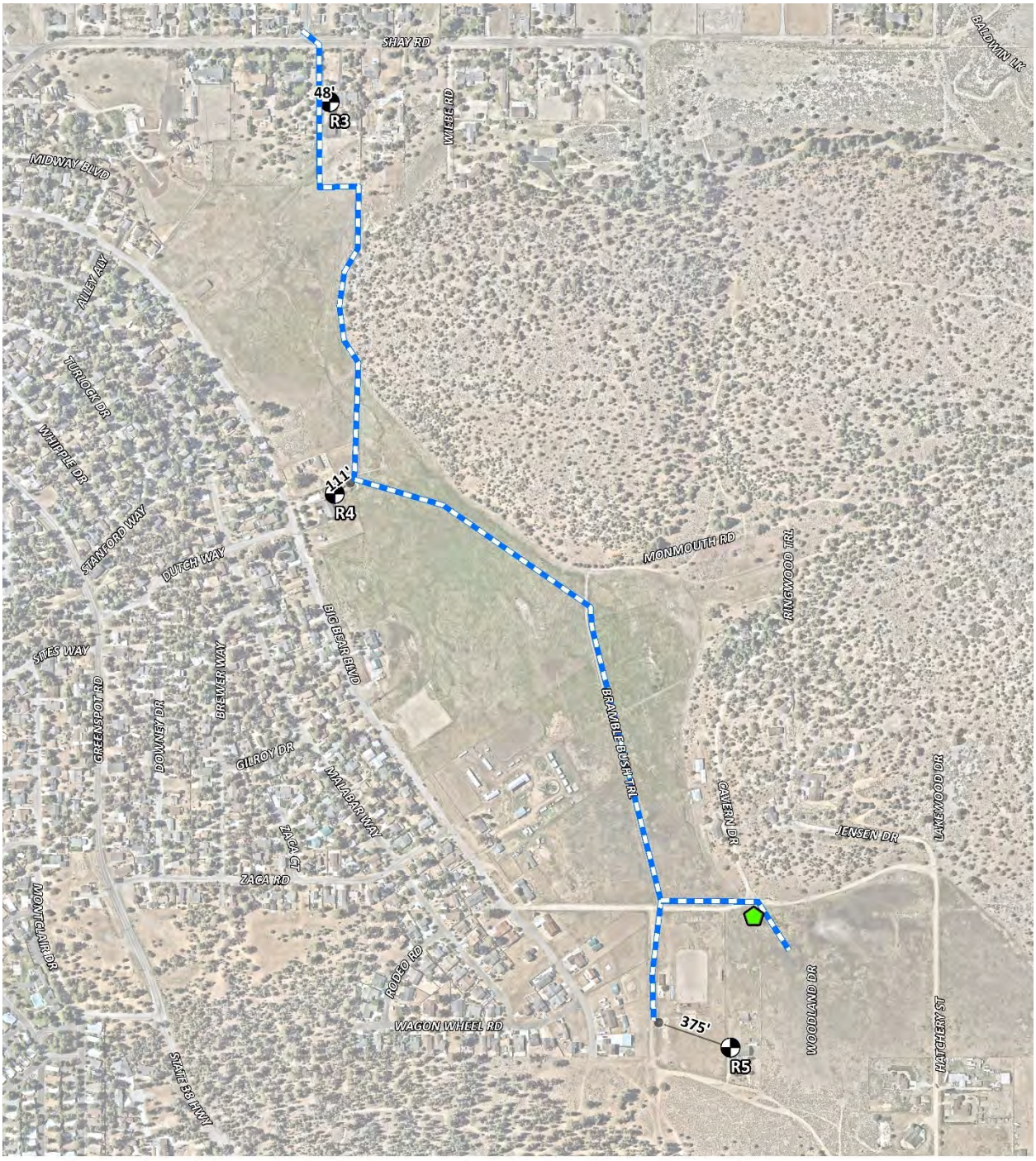


EXHIBIT 8-C: SHAY POND CONSTRUCTION NOISE SOURCES AND RECEIVER LOCATIONS



Construction of the Evaporation Pond improvements would include typical site preparation, grading, and well drilling activities. It is anticipated that Evaporation Pond improvements could be constructed while the BBARWA WWTP Upgrades are being constructed and both these activities have been modeled as simultaneous construction. Exhibit 8-A shows the construction noise source locations and receiver locations used to assess the construction noise levels from the Evaporation Pond improvements.

SAND CANYON GROUNDWATER RECHARGE

The Sand Canyon Groundwater Recharge component involves extracting Project water stored in the Lake to a temporary storage pond using existing infrastructure owned by a local resort. The Project water will then be pumped and conveyed to the Sand Canyon recharge area using a new pump station and 7,210 LF of pipeline. This Sand Canyon Groundwater Recharge improvements include the construction of a new pump station and installation of up to 2 monitoring wells at Sand Canyon.

Construction of the Sand Canyon Groundwater Recharge component would include roadway demolition, pipeline installation, roadbed backfilling, grading, paving activities, and well drilling activities. It is anticipated that Sand Canyon Groundwater Recharge improvements would be constructed with multiple teams. For locations within existing paved right-of-way, pipeline construction is anticipated to extend 200-300 LF per day, while construction along unpaved areas would extend 400-500 LF per day. Exhibit 8-D shows the pipeline locations and receiver locations used to assess the construction noise levels from the Sand Canyon Groundwater Recharge improvements.

8.2 REFERENCE CONSTRUCTION NOISE LEVELS

This construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (18) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation. The usage factor is a key input variable of the RCNM noise prediction model that is used to calculate the average L_{eq} noise levels using the reference L_{max} noise levels measured at 50 feet. Table 8-1 provides a summary of the reference average L_{eq} noise levels used to describe each stage of construction.

Because few details are known at this time regarding construction of specific components of the Project, it is assumed that construction of any Project component may occur simultaneously. As a conservative measure, and in order to identify a reasonable worst-case scenario, this analysis assumes that the Project would construct the certain features simultaneously as discussed in Section 8.1.

EXHIBIT 8-D: SAND CANYON CONSTRUCTION NOISE SOURCE AND RECEIVER LOCATIONS

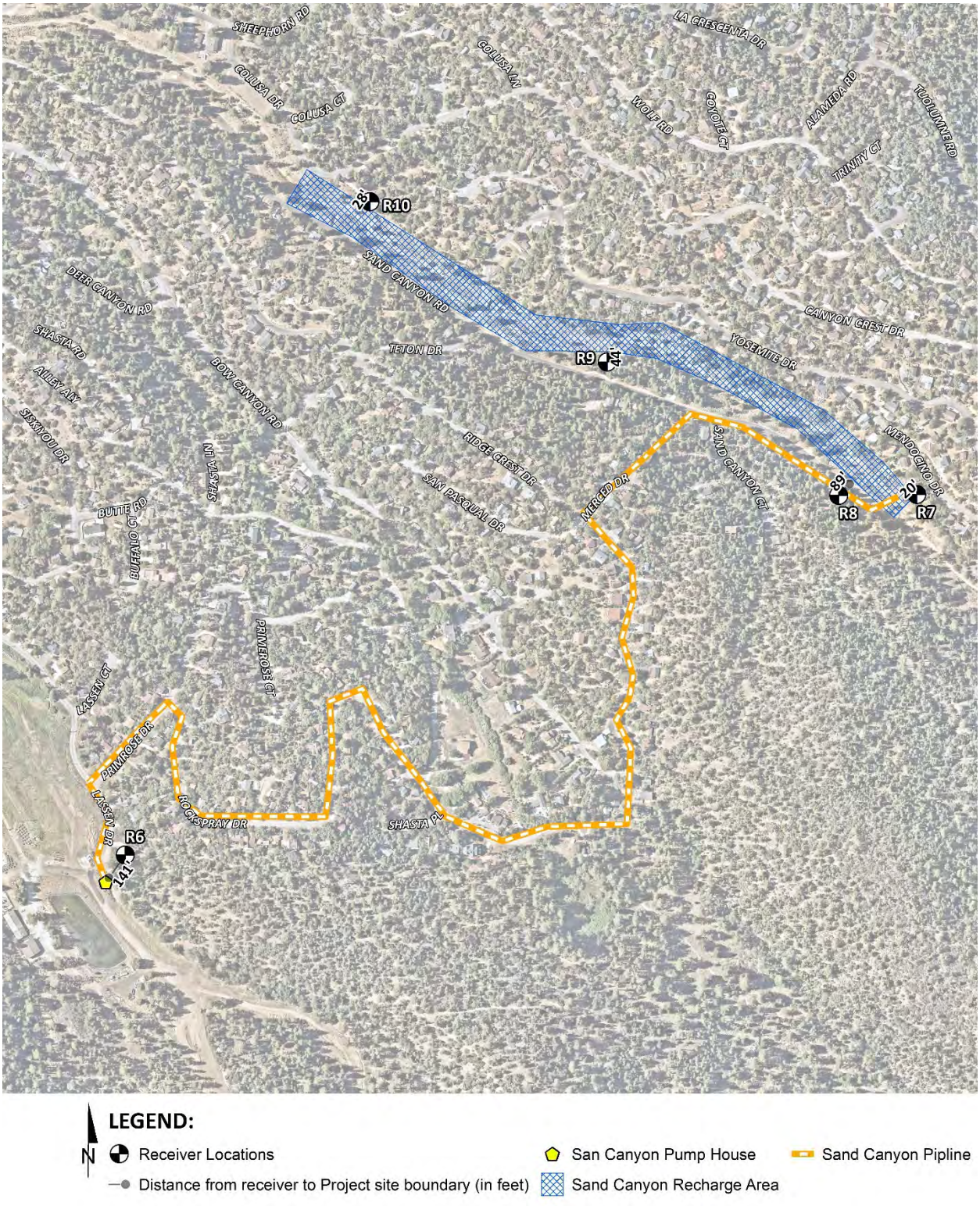


TABLE 8-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Composite Reference Noise Level (dBA L_{eq})	Reference Power Level (dBA L_w)
Demolition	Concrete Saw	83	86.3	118.0
	Impact Hammer (hoe ram)	83		
	Front End Loader	75		
Site Preparation	Tractor	80	84.0	115.6
	Backhoe	74		
	Grader	81		
Grading	Scraper	80	83.3	114.9
	Excavator	77		
	Dozer	78		
Building Construction	Crane	73	80.6	112.2
	Generator	78		
	Front End Loader	75		
Paving	Paver	74	77.8	109.5
	Dump Truck	72		
	Roller	73		
Architectural Coating	Man Lift	68	76.2	107.8
	Compressor (air)	74		
	Generator (<25kVA)	70		
Pipeline Construction	Excavator	77	79.6	111.3
	Front End Loader	75		
	Welder/Torch	70		
Monitoring Well Drilling	Auger Drill Rig	77	81.6	113.3
	Generator	78		
	Front End Loader	75		

[1] FHWA Road Construction Noise Model.

Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver and would be further reduced to 68 dBA at 200 feet from the source to the receiver. A default ground attenuation factor of 0.0 was used in the CadnaA noise prediction model to account for hard site conditions.

8.3 CONSTRUCTION NOISE LEVELS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver

locations were completed for the BBARWA WWTP and Evaporation Pond construction, the Shay Pond Pipeline construction and the pump station and monitoring well installation at Sand Canyon. All other pipeline activities were modeled based on 200 foot and 400 foot pipeline activities, but due to the distances associated with the pipelines and the number of receiver locations, noise levels are predicted at a common distance of 30 feet from these activities for the Lake Discharge and Sand Canyon pipelines. To assess a reasonable worst-case construction scenario and account for the dynamic nature of construction activities, the Project construction noise analysis models the equipment combination with the highest reference level as a moving point source within the construction area (Project site boundary or alignment). As shown on Table 8-2, the highest construction noise levels during the BBARWA WWTP and Evaporation Pond construction activities noise levels are expected to range from 60.5 to 63.5 dBA L_{eq} at the nearest receiver locations. Appendix 8.1 includes the detailed CadnaA construction noise model inputs. These noise levels would not exceed the applicable daytime noise level limit of 80 dBA L_{eq}. Therefore, no mitigation is required for daytime construction activities at the BBARWA WWTP and Evaporation Pond.

As shown on Table 8-3, the highest construction noise levels during the Shay Pond Conveyance Pipeline construction activities noise levels are expected to range from 62.6 to 68.3 dBA L_{eq} at the nearest receiver locations. Appendix 8.2 includes the detailed CadnaA construction noise model inputs. These noise levels would not exceed the applicable daytime noise level limit of 80 dBA L_{eq}. Therefore, no mitigation is required for daytime construction activities along the Shay Pond Conveyance Pipeline.

As shown on Table 8-4, simultaneous construction of the pipeline improvements, the Sand Canyon Pump station, and improvements at the recharge location, the highest construction noise levels are expected to be 65.5 to 72.8 dBA L_{eq} at the nearest receiver locations. Appendix 8.3 includes the detailed CadnaA construction noise model inputs. These noise levels would not exceed the applicable daytime noise level limit of 80 dBA L_{eq}. Therefore, no mitigation is required for daytime construction activities at the Sand Canyon pump station or recharge area.

As indicated pipeline construction would occur within 30 feet of noise sensitive residential receivers along the majority of the Lake Discharge Pipeline and Sand Canyon alignments, at 30 feet pipeline construction activity is estimated to generate noise levels up to 79.1 dBA L_{eq} for segments with paving and 75.6 dBA L_{eq} for the segments without paving. Appendix 8.4 includes the CadnaA construction noise model inputs. These noise levels would not exceed the applicable daytime noise level limit of 80 dBA L_{eq}. Therefore, no mitigation is required for daytime construction activities at the Sand Canyon recharge site.

TABLE 8-2: BBARWA WWTP UPGRADES AND EVAPORATION POND – CONSTRUCTION EQUIPMENT NOISE LEVELS

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	58.9	56.6	55.8	54.4	50.4	55.0	58.9
R2	62.5	60.2	59.4	58.0	54.0	58.6	62.5

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] CadnaA construction noise model inputs are included in Appendix 8.1.

TABLE 8-3: SHAY POND CONVEYANCE PIPELINE –CONSTRUCTION EQUIPMENT NOISE LEVELS

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})			
	Site Preparation	Grading	Pipeline Construction	Highest Levels[2]
R1	68.3	67.6	63.9	68.3
R2	62.6	61.9	58.2	62.6
R3	63.1	62.4	58.7	63.1

[1] Noise receiver locations are shown on Exhibit 8-C.
[2] CadnaA construction noise model inputs are included in Appendix 8.2.

TABLE 8-4: SAND CANYON –CONSTRUCTION EQUIPMENT NOISE LEVELS

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Pipeline Construction	Highest Levels[2]
R6	72.8	72.1	70.6	66.7	68.4	72.8
R7	65.5	64.8	--	--	61.1	65.5
R8	71.9	71.2	--	--	67.5	71.9
R9	65.5	64.8	--	--	61.1	65.5
R10	66.0	65.3	--	--	61.6	66.0

-- Recharge area would not include any building or paving activities.
[1] Noise receiver locations are shown on Exhibit 8-D.
[2] CadnaA construction noise model inputs are included in Appendix 8.3.

MONITORING WELL DRILLING ACTIVITIES

The highest construction noise levels during the Evaporation Pond and Shay Pond monitoring well drilling activities noise levels are expected to exceed the daytime and nighttime noise level limit at the nearest receiver locations within 125 feet and 325 feet, respectively. Since the exact locations of these activities are unknown, and these activities would occur for 24 hours a day for up to two weeks, thus without mitigation these activities will exceed the applicable noise level limit during the nighttime if located within 325 feet of residences. This would be considered a significant impact. Therefore, mitigation is required for nighttime monitoring well drilling activities at the Sand Canyon recharge site.

N-1 Monitoring Well Drilling:

To comply with the nighttime noise level limit during the nighttime hours noise, noise barriers with a minimum height of 14 feet shall be erected surrounding the drilling rig monitoring well locations such that the pumps, compressors, and the drilling rig are completely shielded from nearby residential areas. An effective barrier requires a weight of at least 2 pounds per square foot of face area with no decorative cutouts, perforations, or line-of-sight openings between shielded areas and the source. Examples of temporary barrier material includes 5/8-inch plywood, 5/8-inch oriented-strand board, or sound blankets capable of providing a minimum sound transmission loss (STC) of 27 or a Noise Reduction Coefficient (NRC) of 0.85.

With implementation of the barrier noise levels would be reduced to a maximum noise level of 69 dBA L_{eq} at 50 feet. None of the potential monitoring well locations are located within 50 feet of residences. Therefore, with implementation of mitigation measure N-1, impacts would be less than significant.

8.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearby receiver locations, a construction related daytime noise level limit of 80 dBA L_{eq}, a nighttime noise level limit of 70 dBA L_{eq} (FTA Transit Noise and Vibration Impact Assessment Manual, 2018). The construction noise analysis shows that with mitigation measure N-1, the nearby receiver locations will satisfy the daytime and nighttime significance thresholds during Project construction activities. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all receiver locations.

8.5 CONSTRUCTION VIBRATION ASSESSMENT

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 8-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for human response (annoyance) and

building damage using the following vibration assessment methods defined by the Caltrans. To describe the vibration impacts Caltrans provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 8-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded trucks	0.076
Large bulldozer/Caisson drilling	0.089

Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018, p. 184.

8.6 CONSTRUCTION VIBRATION LEVELS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from typical Project construction activities would cause only intermittent or transient, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to building, the vibration is usually short-term (transient) and is not of enough magnitude to cause building damage.
- Trucks: Trucks hauling building materials to construction sites can be sources of transient vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

To assess the Project construction vibration levels, this analysis describes both the transient vibration levels associated with typical construction equipment activities and the continuous vibration levels associated with the well drilling activities.

8.6.1 TYPICAL CONSTRUCTION ACTIVITY VIBRATION LEVELS

Table 8-6 presents the expected Project related typical construction activity vibration levels at each of the receiver locations. At distances ranging from 20 to 871 feet from Project construction activity, including well drilling, the continuous construction vibration velocity levels are estimated to range from less than 0.00 to 0.124 PPV (in/sec), as shown on Table 8-6. Based on the vibration standards outlined in Table 4-1, the typical Project construction vibration levels will satisfy the transient human annoyance and building damage thresholds. Therefore, the vibration impacts due to Project typical construction activities are considered *less than significant*.

TABLE 8-6: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]					Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level		
R1	817'	0.00	0.00	0.00	0.00	0.00	0.30	No
R2	433'	0.00	0.00	0.00	0.00	0.00	0.30	No
R3	48'	0.00	0.01	0.03	0.03	0.03	0.30	No
R4	111'	0.00	0.00	0.01	0.01	0.01	0.30	No
R5	375'	0.00	0.00	0.00	0.00	0.00	0.30	No
R6	141'	0.00	0.00	0.01	0.01	0.01	0.30	No
R7	20'	0.00	0.05	0.11	0.12	0.12	0.30	No
R8	89'	0.00	0.01	0.01	0.01	0.01	0.30	No
R9	44'	0.00	0.01	0.03	0.04	0.04	0.30	No
R10	28'	0.00	0.03	0.06	0.08	0.08	0.30	No
Pipeline	20'	0.00	0.05	0.11	0.12	0.12	0.30	No

[1] Construction receiver locations are shown on Exhibits 8-A through 8-D.
[2] Distance from receiver location to Project construction boundary.
[3] Based on the Vibration Source Levels of Construction Equipment (Table 8-4).
[4] Caltrans, Transportation and Construction Vibration Guidance Manual, 2020.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

9 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123.* September 2018.
8. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual, FTA-VA-90-1003-06.* May 2006.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
11. **San Bernardino County.** *Countywide Plan.* 2023.
12. **County of San Bernardino.** *Code of Ordinances, Title 8 Development Code, Chapter 83.01 General Performance Standards.*
13. **State of California.** *California Environmental Quality Act, Appendix G.* 2019.
14. **County of San Bernardino Planning Department.** *Airport Comprehensive Land Use Plan, Big Bear City Airport.* 1992.
15. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
16. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
17. **Couty of San Bernardino.** *General Plan.* March 2010.
18. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

This page intentionally left blank

10 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Replenish Big Bear Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (619) 788-1971.

William Maddux
Senior Associate
URBAN CROSSROADS, INC.
(619) 788-1971
bmaddux@urbanxroads.com

EDUCATION

Bachelor of Science in Urban and Regional Planning
California Polytechnic State University, Pomona • June 2000

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
APA – American Planning Association
AWMA – Air and Waste Management Association

PROFESSIONAL CERTIFICATIONS

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • November 2004
CadnaA Basic and Advanced Training Certificate • October 2008

This page intentionally left blank

APPENDIX 3.1:

COUNTY OF SAN BERNARDINO MUNICIPAL CODE

This page intentionally left blank

§ 83.01.080. Noise.

Latest version.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § SI4 1979, Type 1 or Type 2);

(3) Using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2		
Noise Standards for Stationary Noise Sources		
Affected Land Uses (Receiving Noise)	7:00 a.m. - 10:00 p.m. Leq	10:00 p.m. - 7:
Residential	55 dB(A)	45

Professional Services	55 dB(A)	55
Other Commercial	60 dB(A)	60
Industrial	70 dB(A)	70

Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level co same total energy as a time-varying signal over a given sample period, typically one, eight or 24

dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very lo high frequency components of the sound, placing greater emphasis on those frequencies within range of the human ear.

Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7 this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3

Noise Standards for Adjacent Mobile Noise Sources

Land Use		Ldn (or CNEL) dB(A)	
Categories	Uses	Interior (1)	Exteri
Residential	Single and multi-family, duplex, mobile homes		
Commercial	Hotel, motel, transient housing		
Commercial retail, bank, restaurant	50		
Office building, research and development,	45		

professional offices	
Amphitheater, concert hall, auditorium, movie theater	45
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library
Open Space	Park
Notes:	
(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.	
(2) The outdoor environment shall be limited to: · Hospital/office building patios · Hotel and motel recreation areas · Mobile home parks · Multi-family private patios or balconies · Park picnic areas · Private yard of single-family dwellings · School playgrounds	
(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise le been substantially mitigated through a reasonable application of the best available noise reductio and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed that windows and doors remain closed to achieve an acceptable interior noise level shall necess of air conditioning or mechanical ventilation.	
CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted so during a 24-hour day, obtained after addition of approximately five decibels to sound evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night fro p.m. to 7:00 a.m.	

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4	
Noise Standards for Other Structures	
Typical Uses	12-Hour Equivalent Sound Leve dBA Ldn
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

APPENDIX 5.1:

STUDY AREA PHOTOS

THIS PAGE INTENTIONALLY LEFT BLANK

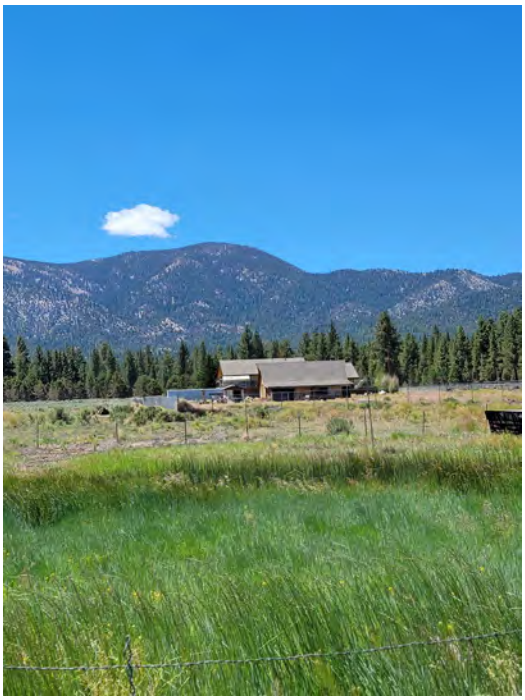
15309 - Replenish Big Bear Program

15309_L1_East
34, 15' 30.942720"116, 48' 53.729279"

15309_L1_North
34, 15' 15.205679"116, 48' 28.463400"

15309_L1_South
34, 15' 15.166439"116, 48' 28.460520"

15309_L1_West
34, 15' 15.176879"116, 48' 28.466999"

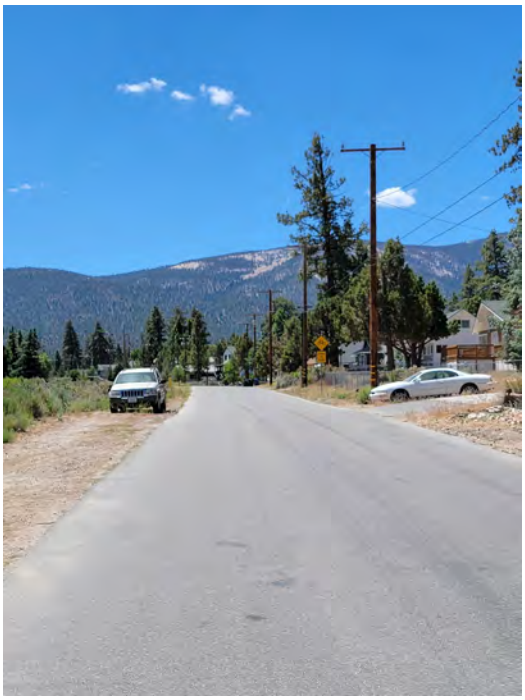


15309 - Replenish Big Bear Program

15309_L2_East
34, 15' 30.970079"116, 48' 53.835840"

15309_L2_North
34, 15' 30.945959"116, 48' 53.721719"

15309_L2_South
34, 15' 30.965759"116, 48' 53.729279"



15309_L2_West
34, 15' 30.963959"116, 48' 53.744039"

15309 - Replenish Big Bear Program

15309_L3_East
34, 16' 0.526799"116, 48' 54.366479"

15309_L3_North
34, 15' 31.659839"116, 48' 53.963280"

15309_L3_South
34, 16' 0.540840"116, 48' 54.409680"

15309_L3_West
34, 16' 0.587999"116, 48' 54.475919"

15309 - Replenish Big Bear Program

15309_L4_East
34, 13' 33.218759"116, 51' 24.072119"

15309_L4_North
34, 16' 0.526799"116, 48' 54.366479"

15309_L4_South
34, 16' 0.526799"116, 48' 54.366479"

15309_L4_West
34, 16' 0.526799"116, 48' 54.366479"

15309 - Replenish Big Bear Program

15309_L5_East
34, 13' 31.554480"116, 51' 12.374640"

15309_L5_North
34, 13' 33.179879"116, 51' 24.118919"

15309_L5_South
34, 13' 33.144599"116, 51' 24.117839"

15309_L5_West
34, 13' 33.144599"116, 51' 24.117839"

15309 - Replenish Big Bear Program

15309_L6_East
34, 13' 48.648359"116, 50' 53.243159"

15309_L6_North
34, 13' 31.519919"116, 51' 12.187800"

15309_L6_South
34, 13' 48.697320"116, 50' 53.206440"

15309_L6_West
34, 13' 48.896400"116, 50' 53.116080"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

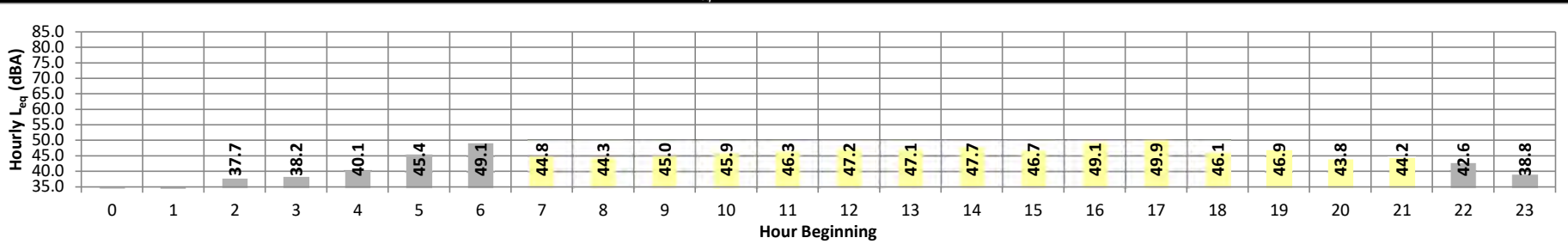
This page intentionally left blank

24-Hour Noise Level Measurement Summary

Date: Wednesday, July 12, 2023 | *Location:* L1 - Northwest of Shay Pond near 2025 Garnet Street | *Meter:* Piccolo II | *JN:* 15309

Project: Big Bear Replenishment Program | *Source:* | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	34.8	39.5	31.8	39.2	38.9	38.1	37.6	35.5	33.8	32.3	32.1	31.8	34.8	10.0	44.8
	1	34.6	41.3	30.9	40.8	40.4	39.4	38.3	34.6	32.9	31.4	31.2	31.0	34.6	10.0	44.6
	2	37.7	45.8	31.3	45.2	44.8	43.6	42.8	38.0	33.6	31.7	31.5	31.3	37.7	10.0	47.7
	3	38.2	44.9	31.7	44.5	44.1	43.3	42.7	39.1	35.6	32.4	32.1	31.8	38.2	10.0	48.2
	4	40.1	46.5	34.1	46.0	45.5	44.6	43.8	41.4	38.3	35.3	34.8	34.3	40.1	10.0	50.1
	5	45.4	51.5	39.6	50.8	50.3	49.4	48.7	46.4	44.1	41.0	40.5	39.8	45.4	10.0	55.4
	6	49.1	55.3	43.9	54.7	54.3	53.3	52.7	49.7	47.5	45.1	44.6	44.1	49.1	10.0	59.1
Day	7	44.8	50.7	41.1	50.0	49.6	48.8	48.1	45.1	43.8	42.1	41.7	41.3	44.8	0.0	44.8
	8	44.3	51.2	40.6	50.4	49.7	48.6	47.6	44.4	43.0	41.4	41.0	40.7	44.3	0.0	44.3
	9	45.0	52.2	40.5	51.4	50.7	49.4	48.4	45.5	43.3	41.3	41.0	40.6	45.0	0.0	45.0
	10	45.9	52.9	41.4	52.1	51.5	50.1	49.0	46.5	44.7	42.4	41.9	41.5	45.9	0.0	45.9
	11	46.3	54.4	41.3	53.6	52.7	51.3	50.4	46.6	44.2	42.2	41.9	41.5	46.3	0.0	46.3
	12	47.2	54.1	41.9	53.5	53.0	51.8	50.8	47.9	45.7	42.9	42.5	42.0	47.2	0.0	47.2
	13	47.1	53.8	41.5	53.3	52.8	51.6	50.8	47.9	45.4	42.5	42.1	41.6	47.1	0.0	47.1
	14	47.7	55.7	41.5	55.1	54.5	52.9	52.0	48.0	45.2	42.5	42.1	41.6	47.7	0.0	47.7
	15	46.7	55.4	41.1	54.8	54.0	51.9	50.3	46.8	44.6	42.1	41.7	41.2	46.7	0.0	46.7
	16	49.1	57.2	42.1	56.6	56.1	55.1	54.3	48.8	45.4	43.1	42.7	42.2	49.1	0.0	49.1
	17	49.9	57.4	42.7	56.9	56.5	55.6	54.9	50.1	46.3	43.6	43.2	42.8	49.9	0.0	49.9
	18	46.1	55.2	40.3	54.4	53.7	52.6	50.7	45.4	43.0	41.2	40.8	40.5	46.1	0.0	46.1
	19	46.9	54.7	38.9	54.2	53.9	52.4	51.5	47.9	43.0	39.9	39.5	39.0	46.9	5.0	51.9
	20	43.8	50.2	39.8	49.3	48.6	47.5	46.8	44.5	42.8	40.8	40.4	40.0	43.8	5.0	48.8
	21	44.2	51.9	38.2	51.1	50.5	49.5	48.6	45.1	41.7	39.0	38.7	38.3	44.2	5.0	49.2
Night	22	42.6	51.7	36.4	50.9	50.2	48.5	47.0	42.4	39.8	37.4	37.0	36.6	42.6	10.0	52.6
	23	38.8	44.9	34.7	44.4	43.8	42.5	42.0	39.4	37.7	35.7	35.3	34.9	38.8	10.0	48.8

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	43.8	50.2	38.2	49.3	48.6	47.5	46.8	44.4	41.7	39.0	38.7	38.3
	Max	49.9	57.4	42.7	56.9	56.5	55.6	54.9	50.1	46.3	43.6	43.2	42.8
Energy Average		46.7	Average:		53.1	52.5	51.3	50.3	46.7	44.1	41.8	41.4	41.0
Night	Min	34.6	39.5	30.9	39.2	38.9	38.1	37.6	34.6	32.9	31.4	31.2	31.0
	Max	49.1	55.3	43.9	54.7	54.3	53.3	52.7	49.7	47.5	45.1	44.6	44.1
Energy Average		42.7	Average:		46.3	45.8	44.7	44.0	40.7	38.1	35.8	35.5	35.1

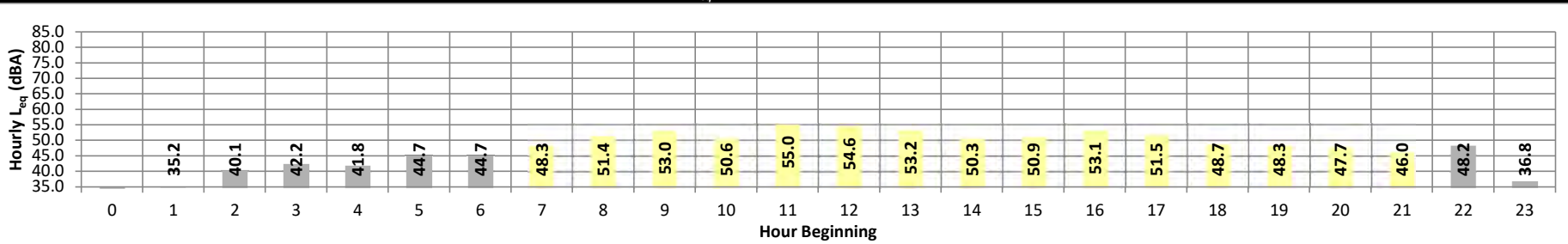
24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
50.4	**46.7**	**42.7**

24-Hour Noise Level Measurement Summary

Date: Wednesday, July 12, 2023 | *Location:* L2 - Loacted near 1485 E Big Bear Blvd | *Meter:* Piccolo II | *JN:* 15309

Project: Big Bear Replenishment Program | *Source:* | *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	34.3	40.8	31.6	40.4	39.8	38.2	37.1	34.4	33.0	32.0	31.8	31.6	34.3	10.0	44.3
	1	35.2	42.9	31.6	41.8	41.1	39.9	38.8	35.4	33.3	32.0	31.8	31.7	35.2	10.0	45.2
	2	40.1	52.2	31.7	52.0	51.4	47.8	44.3	35.1	33.2	32.1	32.0	31.8	40.1	10.0	50.1
	3	42.2	55.0	31.5	54.7	53.8	50.0	46.5	36.4	33.5	31.7	31.6	31.5	42.2	10.0	52.2
	4	41.8	53.8	31.9	53.6	53.1	49.7	46.5	37.5	34.4	32.4	32.1	31.9	41.8	10.0	51.8
	5	44.7	56.3	35.5	55.9	55.1	52.0	48.9	42.3	39.7	36.9	36.4	35.8	44.7	10.0	54.7
	6	44.7	55.2	39.0	54.9	54.0	50.7	48.1	43.5	41.9	39.9	39.6	39.2	44.7	10.0	54.7
Day	7	48.3	60.1	37.7	59.7	59.0	56.0	53.3	44.8	41.5	38.8	38.4	37.9	48.3	0.0	48.3
	8	51.4	63.0	38.5	62.6	62.0	59.2	57.0	48.1	44.1	40.1	39.4	38.7	51.4	0.0	51.4
	9	53.0	65.2	38.2	64.8	64.1	60.7	57.8	49.8	44.9	39.6	39.0	38.4	53.0	0.0	53.0
	10	50.6	61.9	39.6	61.6	60.9	57.8	55.1	48.9	44.7	40.9	40.4	39.8	50.6	0.0	50.6
	11	55.0	67.1	46.7	66.7	65.8	62.4	59.2	51.2	49.1	47.4	47.1	46.8	55.0	0.0	55.0
	12	54.6	63.0	50.6	62.7	62.2	59.6	57.9	54.0	52.5	51.3	51.0	50.8	54.6	0.0	54.6
	13	53.2	64.1	44.5	63.8	63.1	60.1	57.7	51.7	48.1	45.2	44.9	44.6	53.2	0.0	53.2
	14	50.3	61.2	39.2	60.9	60.4	57.7	55.4	48.8	44.2	40.5	40.0	39.3	50.3	0.0	50.3
	15	50.9	61.9	39.4	61.5	60.9	58.3	55.9	49.0	45.3	40.7	40.1	39.6	50.9	0.0	50.9
	16	53.1	65.6	39.7	65.2	64.6	60.9	57.5	49.5	45.0	40.7	40.2	39.8	53.1	0.0	53.1
	17	51.5	63.1	40.3	62.8	62.2	59.3	56.5	48.6	44.6	41.3	40.9	40.4	51.5	0.0	51.5
	18	48.7	60.4	37.0	60.1	59.6	56.6	53.4	45.7	42.1	38.3	37.7	37.2	48.7	0.0	48.7
	19	48.3	59.9	35.4	59.6	59.0	55.9	53.5	45.4	40.3	36.4	36.1	35.6	48.3	5.0	53.3
	20	47.7	59.5	36.3	59.0	58.2	55.1	52.2	45.6	41.5	37.1	36.7	36.4	47.7	5.0	52.7
	21	46.0	57.2	36.5	56.9	56.4	53.6	50.7	43.4	40.0	37.2	36.9	36.6	46.0	5.0	51.0
Night	22	48.2	60.9	35.6	60.4	59.7	56.5	53.1	42.1	38.8	36.3	36.0	35.7	48.2	10.0	58.2
	23	36.8	42.0	33.3	41.8	41.5	40.7	39.8	37.5	35.6	33.9	33.6	33.4	36.8	10.0	46.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	46.0	57.2	35.4	56.9	56.4	53.6	50.7	43.4	40.0	36.4	36.1	35.6
	Max	55.0	67.1	50.6	66.7	65.8	62.4	59.2	54.0	52.5	51.3	51.0	50.8
Energy Average		51.6	Average:		61.9	61.2	58.2	55.5	48.3	44.5	41.0	40.6	40.1
Night	Min	34.3	40.8	31.5	40.4	39.8	38.2	37.1	34.4	33.0	31.7	31.6	31.5
	Max	48.2	60.9	39.0	60.4	59.7	56.5	53.1	43.5	41.9	39.9	39.6	39.2
Energy Average		43.0	Average:		50.6	49.9	47.3	44.8	38.2	35.9	34.1	33.9	33.6

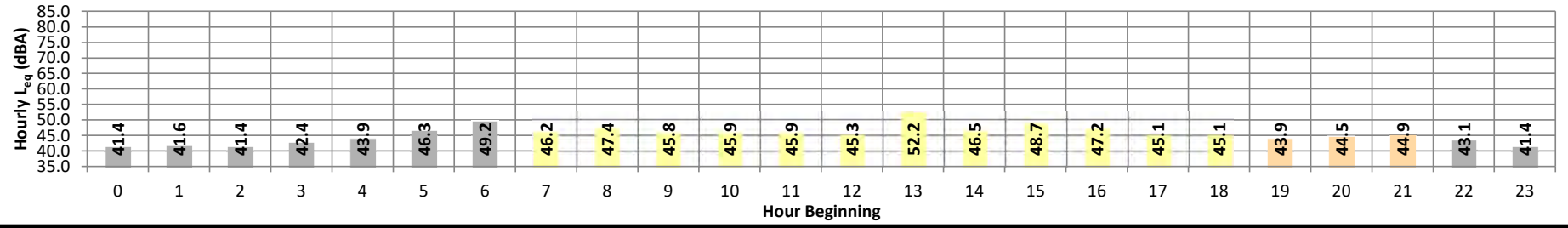
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
52.5	**51.6**	**43.0**

24-Hour Noise Level Measurement Summary

Date: Wednesday, July 12, 2023 *Location:* L3 - Located near 109 Palomino Drive *Meter:* Piccolo II *JN:* 12640

Project: *Analyst:* P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	41.4	42.5	40.8	42.3	42.3	42.2	42.0	41.5	41.1	40.8	40.7	40.7	41.4	10.0	51.4
	1	41.6	42.4	41.2	42.3	42.2	42.1	42.1	41.7	41.4	41.1	41.1	41.1	41.6	10.0	51.6
	2	41.4	41.8	41.0	41.7	41.6	41.6	41.5	41.4	41.2	41.0	41.0	40.9	41.4	10.0	51.4
	3	42.4	43.3	41.8	43.2	43.2	43.1	43.0	42.6	42.2	41.8	41.7	41.7	42.4	10.0	52.4
	4	43.9	44.7	43.2	44.6	44.6	44.5	44.4	44.1	43.7	43.3	43.2	43.1	43.9	10.0	53.9
	5	46.3	50.9	44.2	50.7	50.4	49.9	49.3	46.9	45.2	44.3	44.2	44.1	46.3	10.0	56.3
	6	49.2	53.2	44.9	53.1	52.9	52.5	52.1	50.5	48.5	45.6	45.2	44.9	49.2	10.0	59.2
Day	7	46.2	49.4	43.3	49.3	49.2	49.0	48.8	47.3	45.4	43.5	43.4	43.3	46.2	0.0	46.2
	8	47.4	53.0	43.6	52.9	52.8	52.1	51.5	48.0	45.5	43.9	43.7	43.5	47.4	0.0	47.4
	9	45.8	49.1	43.1	49.0	48.9	48.6	48.3	46.9	45.2	43.3	43.2	43.0	45.8	0.0	45.8
	10	45.9	50.3	43.0	49.9	49.7	49.3	48.9	47.0	44.7	43.1	43.0	42.9	45.9	0.0	45.9
	11	45.9	49.3	43.1	49.2	49.1	48.7	48.4	46.8	45.3	43.3	43.2	43.1	45.9	0.0	45.9
	12	45.3	48.1	43.0	48.0	48.0	47.7	47.5	46.3	44.8	43.1	43.0	42.9	45.3	0.0	45.3
	13	52.2	56.2	48.1	56.1	56.0	55.6	55.3	53.5	51.5	48.6	48.4	48.1	52.2	0.0	52.2
	14	46.5	49.5	44.0	49.4	49.4	49.2	48.9	47.4	45.8	44.2	44.1	44.0	46.5	0.0	46.5
	15	48.7	52.2	43.7	52.1	52.0	51.8	51.6	50.3	48.3	44.3	43.9	43.7	48.7	0.0	48.7
	16	47.2	50.8	43.7	50.7	50.6	50.3	50.0	48.5	46.5	44.0	43.8	43.7	47.2	0.0	47.2
	17	45.1	47.3	43.4	47.2	47.1	46.9	46.7	45.8	44.6	43.5	43.4	43.3	45.1	0.0	45.1
	18	45.1	49.2	42.6	49.2	49.1	48.6	47.9	45.9	44.1	42.8	42.6	42.6	45.1	0.0	45.1
Evening	19	43.9	46.3	42.4	46.2	46.1	45.9	45.6	44.5	43.3	42.5	42.4	42.3	43.9	5.0	48.9
	20	44.5	46.8	42.8	46.7	46.7	46.4	46.1	45.1	44.0	43.0	42.8	42.7	44.5	5.0	49.5
	21	44.9	47.1	42.8	47.0	47.0	46.8	46.6	45.7	44.6	43.0	42.9	42.7	44.9	5.0	49.9
Night	22	43.1	45.0	41.8	44.9	44.9	44.7	44.6	43.7	42.7	41.9	41.8	41.7	43.1	10.0	53.1
	23	41.4	42.3	40.8	42.2	42.2	42.1	41.9	41.5	41.2	40.8	40.7	40.7	41.4	10.0	51.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	45.1	47.3	42.6	47.2	47.1	46.9	46.7	45.8	44.1	42.8	42.6	42.6
(7am-7pm)	Max	52.2	56.2	48.1	56.1	56.0	55.6	55.3	53.5	51.5	48.6	48.4	48.1
Energy Average		47.3	Average:		50.3	50.2	49.8	49.5	47.8	46.0	44.0	43.8	43.7
Evening	Min	43.9	46.3	42.4	46.2	46.1	45.9	45.6	44.5	43.3	42.5	42.4	42.3
(7pm-10pm)	Max	44.9	47.1	42.8	47.0	47.0	46.8	46.6	45.7	44.6	43.0	42.9	42.7
Energy Average		44.4	Average:		46.6	46.6	46.4	46.1	45.1	44.0	42.8	42.7	42.6
Night	Min	41.4	41.8	40.8	41.7	41.6	41.6	41.5	41.4	41.1	40.8	40.7	40.7
(10pm-7am)	Max	49.2	53.2	44.9	53.1	52.9	52.5	52.1	50.5	48.5	45.6	45.2	44.9
Energy Average		44.3	Average:		45.0	44.9	44.7	44.5	43.8	43.0	42.3	42.2	42.1

L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
46.1	46.9	44.3

24-Hour CNEL (dBA)

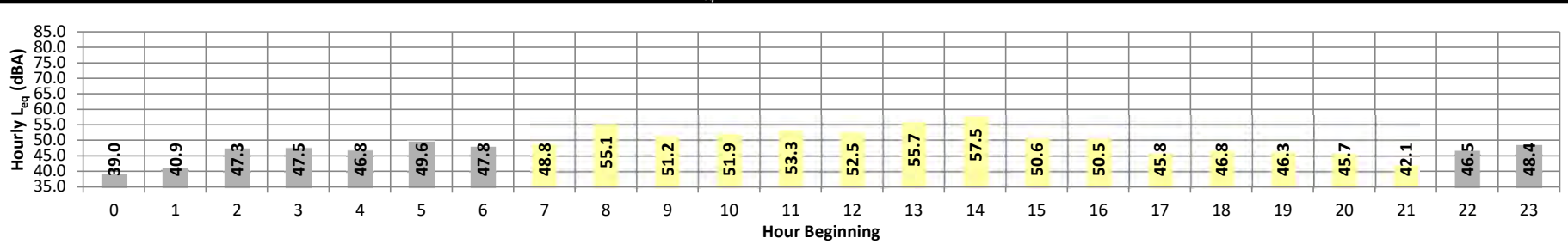
51.5

24-Hour Noise Level Measurement Summary

Date: Wednesday, July 12, 2023 *Location:* L4 -Located near 1467 Lassen Drive *Meter:* Piccolo II *JN:* 15309

Project: Big Bear Replenishment Program *Source:* *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	39.0	40.6	38.5	39.6	39.5	39.3	39.2	38.9	38.8	38.6	38.5	38.5	39.0	10.0	49.0
	1	40.9	44.9	39.2	43.4	43.1	42.5	42.2	41.4	40.5	39.5	39.4	39.3	40.9	10.0	50.9
	2	47.3	57.0	41.5	55.7	54.9	52.8	51.2	47.3	44.7	42.3	42.0	41.7	47.3	10.0	57.3
	3	47.5	57.5	41.3	55.7	54.5	52.6	51.0	47.7	45.6	42.2	41.9	41.5	47.5	10.0	57.5
	4	46.8	55.1	41.9	53.7	52.9	51.2	50.1	47.2	45.2	42.7	42.3	42.0	46.8	10.0	56.8
	5	49.6	62.2	40.0	61.6	61.0	57.5	53.6	44.8	42.4	40.5	40.3	40.0	49.6	10.0	59.6
	6	47.8	60.2	39.5	59.4	58.6	55.8	52.4	43.3	41.2	40.0	39.8	39.6	47.8	10.0	57.8
Day	7	48.8	60.0	39.8	59.2	58.8	57.4	55.3	43.8	41.2	40.2	40.1	39.9	48.8	0.0	48.8
	8	55.1	66.6	40.8	66.0	65.4	62.9	60.6	53.9	44.0	41.5	41.3	40.9	55.1	0.0	55.1
	9	51.2	63.2	42.5	61.3	60.0	57.4	55.6	50.4	47.6	44.4	43.9	43.2	51.2	0.0	51.2
	10	51.9	64.2	42.5	63.1	62.4	59.1	56.9	49.0	46.0	43.4	43.1	42.7	51.9	0.0	51.9
	11	53.3	65.1	44.3	63.9	62.9	59.5	57.2	51.9	49.0	45.6	45.1	44.6	53.3	0.0	53.3
	12	52.5	62.6	44.5	61.3	60.8	58.9	57.2	52.1	49.0	45.7	45.3	44.8	52.5	0.0	52.5
	13	55.7	69.5	43.9	68.1	66.9	63.4	58.3	51.6	48.5	45.2	44.7	44.2	55.7	0.0	55.7
	14	57.5	74.9	44.0	70.3	68.0	64.1	61.1	52.3	48.4	45.3	44.8	44.3	57.5	0.0	57.5
	15	50.6	61.2	42.7	59.9	59.2	57.1	55.3	50.0	46.7	43.8	43.4	43.0	50.6	0.0	50.6
	16	50.5	61.5	42.3	60.3	59.3	56.7	54.4	49.9	47.1	43.6	43.1	42.6	50.5	0.0	50.5
	17	45.8	57.3	39.8	55.8	54.9	52.5	50.0	44.2	42.2	40.4	40.2	39.9	45.8	0.0	45.8
	18	46.8	58.0	40.4	57.1	56.0	53.2	51.0	44.8	42.8	41.1	40.9	40.6	46.8	0.0	46.8
	19	46.3	56.8	41.3	55.2	54.0	51.8	49.9	45.6	44.0	42.1	41.8	41.4	46.3	5.0	51.3
	20	45.7	58.7	39.7	56.9	55.7	51.6	48.7	43.3	41.6	40.2	40.0	39.7	45.7	5.0	50.7
	21	42.1	50.0	39.4	48.2	47.6	46.0	44.6	42.0	40.8	39.7	39.6	39.5	42.1	5.0	47.1
Night	22	46.5	55.1	41.9	53.3	52.2	50.8	49.8	47.0	45.1	42.7	42.4	42.0	46.5	10.0	56.5
	23	48.4	57.6	42.8	55.8	54.8	53.2	52.1	48.8	46.4	43.9	43.4	43.0	48.4	10.0	58.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	42.1	50.0	39.4	48.2	47.6	46.0	44.6	42.0	40.8	39.7	39.6	39.5
	Max	57.5	74.9	44.5	70.3	68.0	64.1	61.1	53.9	49.0	45.7	45.3	44.8
Energy Average		52.1	Average:		60.4	59.5	56.8	54.4	48.3	45.3	42.8	42.5	42.1
Night	Min	39.0	40.6	38.5	39.6	39.5	39.3	39.2	38.9	38.8	38.6	38.5	38.5
	Max	49.6	62.2	42.8	61.6	61.0	57.5	53.6	48.8	46.4	43.9	43.4	43.0
Energy Average		46.9	Average:		53.1	52.4	50.6	49.1	45.2	43.3	41.4	41.1	40.8

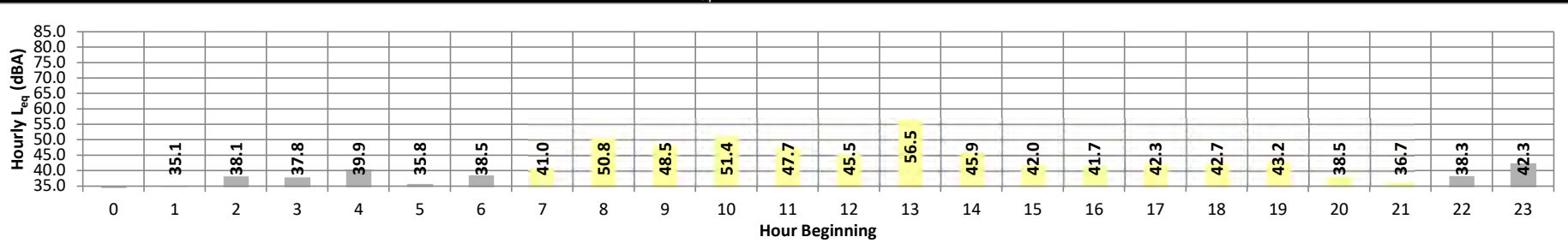
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
54.7	**52.1**	**46.9**

24-Hour Noise Level Measurement Summary

Date: Wednesday, July 12, 2023 *Location:* L5 - Located near 43652 Sand Canyon Road *Meter:* Piccolo II *JN:* 15309

Project: Big Bear Replenishment Program *Source:* *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	30.4	32.7	29.6	32.3	32.1	31.8	31.4	30.6	30.2	29.7	29.7	29.6	30.4	10.0	40.4
	1	35.1	38.7	32.3	38.6	38.5	38.2	37.8	36.0	34.1	32.7	32.5	32.3	35.1	10.0	45.1
	2	38.1	42.4	34.9	42.2	42.0	41.3	40.9	39.0	37.3	35.4	35.2	35.0	38.1	10.0	48.1
	3	37.8	41.3	35.2	41.1	40.9	40.5	40.1	38.7	37.2	35.6	35.4	35.2	37.8	10.0	47.8
	4	39.9	44.2	36.3	44.0	43.8	43.1	42.6	40.9	39.2	37.0	36.7	36.4	39.9	10.0	49.9
	5	35.8	40.7	32.8	40.2	39.7	38.8	38.1	36.5	35.1	33.4	33.2	32.9	35.8	10.0	45.8
	6	38.5	46.5	32.2	46.1	45.7	44.8	44.2	37.5	34.9	32.8	32.6	32.3	38.5	10.0	48.5
Day	7	41.0	51.5	32.2	51.1	50.4	49.7	47.6	37.0	34.6	32.9	32.6	32.4	41.0	0.0	41.0
	8	50.8	59.6	37.8	59.2	58.7	56.7	54.9	51.6	48.7	39.9	38.9	38.0	50.8	0.0	50.8
	9	48.5	56.4	40.8	55.9	55.2	52.6	51.6	49.6	47.5	42.1	41.5	41.0	48.5	0.0	48.5
	10	51.4	59.3	42.9	58.8	58.3	56.6	55.3	52.1	49.8	44.6	43.8	43.1	51.4	0.0	51.4
	11	47.7	58.9	41.2	57.8	56.6	53.7	51.4	46.6	44.7	42.3	41.9	41.4	47.7	0.0	47.7
	12	45.5	55.5	38.3	54.7	53.8	51.9	50.0	44.4	42.3	39.7	39.2	38.5	45.5	0.0	45.5
	13	56.5	63.9	45.9	63.0	62.1	60.8	60.0	57.5	55.1	50.9	49.4	46.8	56.5	0.0	56.5
	14	45.9	55.2	38.3	54.3	53.6	52.3	51.3	46.6	41.6	39.1	38.7	38.4	45.9	0.0	45.9
	15	42.0	48.2	38.0	47.5	46.9	45.9	45.2	42.6	41.0	38.9	38.6	38.1	42.0	0.0	42.0
	16	41.7	49.2	36.6	49.1	48.7	47.5	45.8	41.5	39.8	37.5	37.0	36.7	41.7	0.0	41.7
	17	42.3	51.3	35.8	50.9	50.3	49.2	47.5	41.2	39.2	36.5	36.2	35.9	42.3	0.0	42.3
	18	42.7	52.2	36.3	51.9	51.5	49.8	47.4	41.1	39.3	37.1	36.8	36.4	42.7	0.0	42.7
	19	43.2	53.6	36.8	53.1	52.6	50.0	46.9	41.5	39.8	37.6	37.2	36.9	43.2	5.0	48.2
	20	38.5	46.4	33.1	45.9	45.6	44.9	42.8	38.1	36.2	33.7	33.5	33.2	38.5	5.0	43.5
	21	36.7	45.3	31.7	45.0	44.7	43.2	41.6	35.6	33.6	32.1	31.9	31.8	36.7	5.0	41.7
Night	22	38.3	41.7	35.6	41.5	41.3	40.8	40.4	39.1	37.8	36.1	35.8	35.6	38.3	10.0	48.3
	23	42.3	45.9	39.0	45.7	45.6	45.1	44.7	43.3	41.7	39.8	39.4	39.1	42.3	10.0	52.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	36.7	45.3	31.7	45.0	44.7	43.2	41.6	35.6	33.6	32.1	31.9	31.8
	Max	56.5	63.9	45.9	63.0	62.1	60.8	60.0	57.5	55.1	50.9	49.4	46.8
Energy Average		48.3	Average:		53.2	52.6	51.0	49.3	44.5	42.2	39.0	38.5	37.9
Night	Min	30.4	32.7	29.6	32.3	32.1	31.8	31.4	30.6	30.2	29.7	29.7	29.6
	Max	42.3	46.5	39.0	46.1	45.7	45.1	44.7	43.3	41.7	39.8	39.4	39.1
Energy Average		38.3	Average:		41.3	41.1	40.5	40.0	38.0	36.4	34.7	34.5	34.3

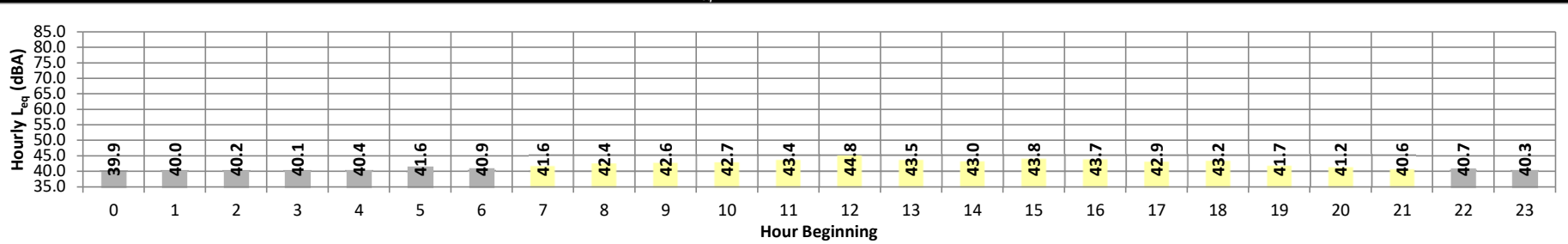
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
48.5	**48.3**	**38.3**

24-Hour Noise Level Measurement Summary

Date: Wednesday, July 12, 2023 *Location:* L6 - Located near 43485 Colusa Drive *Meter:* Piccolo II *JN:* 15309

Project: Big Bear Replenishment Program *Source:* *Analyst:* B. Maddux

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	39.9	40.2	39.8	40.1	40.0	39.9	39.9	39.9	39.8	39.7	39.7	39.7	39.9	10.0	49.9
	1	40.0	40.3	39.9	40.1	40.1	40.0	40.0	39.9	39.9	39.8	39.8	39.8	40.0	10.0	50.0
	2	40.2	40.4	40.0	40.3	40.3	40.2	40.2	40.1	40.0	40.0	40.0	39.9	40.2	10.0	50.2
	3	40.1	40.3	40.0	40.2	40.1	40.1	40.1	40.0	40.0	40.0	40.0	39.9	40.1	10.0	50.1
	4	40.4	41.6	40.1	41.3	41.0	40.8	40.7	40.4	40.2	40.0	40.0	40.0	40.4	10.0	50.4
	5	41.6	47.0	40.0	46.5	46.0	44.9	43.7	41.7	40.6	40.1	40.0	40.0	41.6	10.0	51.6
	6	40.9	44.0	40.1	43.5	43.0	42.2	41.8	41.0	40.5	40.2	40.1	40.1	40.9	10.0	50.9
Day	7	41.6	47.0	40.3	46.4	45.8	44.3	43.2	41.5	40.8	40.4	40.3	40.2	41.6	0.0	41.6
	8	42.4	47.5	40.7	47.0	46.3	45.0	44.2	42.5	41.5	40.9	40.8	40.7	42.4	0.0	42.4
	9	42.6	48.7	41.0	48.3	47.4	45.9	45.1	42.1	41.6	41.0	41.0	40.9	42.6	0.0	42.6
	10	42.7	47.7	41.2	47.2	46.7	45.2	44.4	42.8	42.0	41.3	41.2	41.1	42.7	0.0	42.7
	11	43.4	51.1	41.2	50.6	50.0	47.4	45.6	43.0	42.0	41.4	41.3	41.2	43.4	0.0	43.4
	12	44.8	52.2	41.6	51.3	50.7	48.8	47.7	45.1	43.5	41.8	41.7	41.5	44.8	0.0	44.8
	13	43.5	49.1	41.4	48.7	48.3	46.9	45.9	43.6	42.4	41.6	41.4	41.3	43.5	0.0	43.5
	14	43.0	48.0	41.4	47.6	47.1	45.7	44.8	43.1	42.3	41.5	41.4	41.3	43.0	0.0	43.0
	15	43.8	51.6	41.2	51.2	50.7	48.6	46.8	42.9	42.2	41.4	41.3	41.1	43.8	0.0	43.8
	16	43.7	51.3	41.3	50.6	49.9	47.5	46.0	43.4	42.4	41.5	41.4	41.2	43.7	0.0	43.7
	17	42.9	49.7	40.7	49.2	48.6	46.9	45.7	42.8	41.5	40.8	40.7	40.6	42.9	0.0	42.9
	18	43.2	51.2	40.7	50.7	50.0	48.0	46.2	42.3	41.2	40.8	40.7	40.7	43.2	0.0	43.2
	19	41.7	48.5	40.4	48.0	47.3	45.2	43.6	41.1	40.7	40.4	40.4	40.3	41.7	5.0	46.7
	20	41.2	44.8	40.1	44.5	44.1	43.5	43.0	41.6	40.5	40.1	40.0	40.0	41.2	5.0	46.2
	21	40.6	43.6	40.0	43.2	42.8	41.9	41.6	40.5	40.1	39.9	39.9	39.9	40.6	5.0	45.6
Night	22	40.7	45.2	40.0	44.9	44.3	42.8	41.8	40.5	40.1	40.0	39.9	39.9	40.7	10.0	50.7
	23	40.3	41.0	40.1	40.8	40.7	40.6	40.5	40.3	40.2	40.1	40.0	40.0	40.3	10.0	50.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	40.6	43.6	40.0	43.2	42.8	41.9	41.6	40.5	40.1	39.9	39.9	39.9
	Max	44.8	52.2	41.6	51.3	50.7	48.8	47.7	45.1	43.5	41.8	41.7	41.5
Energy Average		42.9	Average:		48.3	47.7	46.1	44.9	42.5	41.7	41.0	40.9	40.8
Night	Min	39.9	40.2	39.8	40.1	40.0	39.9	39.9	39.9	39.8	39.7	39.7	39.7
	Max	41.6	47.0	40.1	46.5	46.0	44.9	43.7	41.7	40.6	40.2	40.1	40.1
Energy Average		40.5	Average:		41.9	41.7	41.3	41.0	40.4	40.1	40.0	40.0	39.9

24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
47.6	**42.9**	**40.5**

APPENDIX 8.1:

BBARWA WWTP AND EVAPORATION POND CADNAA CONSTRUCTION NOISE MODEL INPUTS

This page intentionally left blank

15309 - Big Bear Replinishment

CadnaA Noise Prediction Model: 15309-02_Phase1_Construction.cna
Date: 26.09.23
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R1		R1	60.5	55.2	62.8	0.0	0.0	0.0		x	Total	5.00	a	6390842.37	2404958.11	5.00
R2		R2	63.5	56.7	64.9	0.0	0.0	0.0		x	Total	5.00	a	6391087.60	2405366.53	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
Well1		Well1	117.8	117.8	117.8	Lw	117.8					8.00	r	6390831.21	2406459.86	8.00
Well2		Well2	117.8	117.8	117.8	Lw	117.8					8.00	r	6389517.71	2405871.15	8.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
Construction_Area		CA01	121.0	18.0	18.0	78.4	-24.6	-24.6	PWL-Pt	118					8	a
Evaporation Pond		CA2	116.0	16.0	16.0	62.8	-37.2	-37.2	PWL-Pt	116					8	a

Name	ID	Height			Coordinates			
		Begin		End	x	y	z	Ground
		(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
Construction_Area	CA01	8.00	a		6391208.77	2406315.04	8.00	0.00
					6391208.71	2405984.80	8.00	0.00
					6390937.50	2405980.83	8.00	0.00
					6390941.89	2405774.13	8.00	0.00
					6390613.92	2405776.91	8.00	0.00
					6390617.13	2405987.30	8.00	0.00
					6390822.48	2405989.52	8.00	0.00
					6390818.14	2406315.84	8.00	0.00
Evaporation Pond	CA2	8.00	a		6389867.56	2406517.44	8.00	0.00
					6389795.94	2406443.66	8.00	0.00
					6389750.37	2406378.12	8.00	0.00
					6389740.39	2406254.42	8.00	0.00
					6389743.21	2406218.83	8.00	0.00
					6389730.19	2406156.33	8.00	0.00
					6389710.01	2406089.92	8.00	0.00
					6389640.56	2405994.44	8.00	0.00
					6389584.57	2405897.65	8.00	0.00
					6389536.83	2405841.23	8.00	0.00
					6389273.81	2405816.92	8.00	0.00
					6389149.68	2405819.52	8.00	0.00
					6389033.36	2405827.34	8.00	0.00
					6388910.96	2405840.36	8.00	0.00
					6388732.58	2405857.29	8.00	0.00
					6388571.12	2405920.22	8.00	0.00
					6388414.87	2406007.02	8.00	0.00
					6388326.33	2406089.06	8.00	0.00
					6388246.03	2406207.11	8.00	0.00
					6388230.84	2406332.98	8.00	0.00
					6388264.26	2406481.85	8.00	0.00
					6388314.17	2406616.40	8.00	0.00
					6388442.64	2406798.69	8.00	0.00
					6388588.04	2406907.20	8.00	0.00
					6388702.19	2406966.66	8.00	0.00
					6388824.59	2407000.08	8.00	0.00
					6389116.69	2407017.01	8.00	0.00
					6389536.83	2407022.65	8.00	0.00
					6389840.65	2407023.52	8.00	0.00
					6390146.64	2407027.86	8.00	0.00
					6390402.71	2407008.33	8.00	0.00
					6390565.78	2407008.81	8.00	0.00
					6390756.45	2407019.18	8.00	0.00
					6390854.10	2407010.50	8.00	0.00
					6390925.72	2406993.14	8.00	0.00
					6390953.93	2406971.43	8.00	0.00
					6391016.86	2406915.01	8.00	0.00
					6391055.93	2406854.25	8.00	0.00
					6391101.50	2406763.10	8.00	0.00
					6391118.86	2406700.17	8.00	0.00
					6391116.69	2406556.94	8.00	0.00
					6391097.16	2406507.02	8.00	0.00
					6391045.08	2406467.96	8.00	0.00
					6390975.63	2406470.13	8.00	0.00
					6390899.24	2406467.96	8.00	0.00
					6390871.46	2406446.26	8.00	0.00
					6390786.83	2406439.75	8.00	0.00
					6390719.55	2406439.75	8.00	0.00
					6390662.48	2406431.07	8.00	0.00
					6390645.55	2406533.93	8.00	0.00
					6390580.63	2406534.20	8.00	0.00
					6390515.34	2406531.33	8.00	0.00
					6390464.56	2406530.03	8.00	0.00
					6390396.85	2406532.63	8.00	0.00
					6390032.27	2406536.54	8.00	0.00
					6389982.79	2406532.63	8.00	0.00
					6389914.43	2406526.56	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground	(ft)	(%)
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		

This page intentionally left blank

APPENDIX 8.2:

SHAY POND CADNAA CONSTRUCTION NOISE MODEL INPUTS

This page intentionally left blank

15309 - Big Bear Replinishment

CadnaA Noise Prediction Model: 15309-02_Shay_Pond.cna
Date: 26.09.23
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R3		R3	68.3	-31.7	65.3	0.0	0.0	0.0		x	Total	5.00	a	6391064.71	2404142.30	5.00
R4		R4	62.6	-37.4	59.6	0.0	0.0	0.0		x	Total	5.00	a	6391088.40	2402348.03	5.00
R5		R5	63.1	-36.9	60.1	0.0	0.0	0.0		x	Total	5.00	a	6392902.24	2399808.91	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)	(ft)	(ft)	(ft)

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SHAY_POND_PIPELINES_ZVI		0	118.0	18.0	18.0	77.9	-22.1	-22.1	PWL-Pt	118					8	a

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SHAY_POND_PIPELINES_ZVI		0	118.0	18.0	18.0	86.8	-13.2	-13.2	PWL-Pt	118					8	a
SHAY_POND_PIPELINES_ZVI		0	118.0	18.0	18.0	103.0	3.0	3.0	PWL-Pt	118					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SHAY_POND_PIPELINES_ZVI	0	8.00	a			6391025.91	2404405.75	8.00	0.00
						6391027.14	2403761.66	8.00	0.00
						6391196.17	2403766.61	8.00	0.00
						6391197.78	2403766.53	8.00	0.00
						6391199.36	2403766.19	8.00	0.00
						6391200.86	2403765.59	8.00	0.00
						6391202.25	2403764.77	8.00	0.00
						6391203.49	2403763.73	8.00	0.00
						6391204.54	2403762.50	8.00	0.00
						6391205.39	2403761.13	8.00	0.00
						6391206.00	2403759.63	8.00	0.00
						6391206.36	2403758.06	8.00	0.00
						6391206.46	2403756.44	8.00	0.00
						6391201.51	2403468.95	8.00	0.00
						6391201.34	2403467.26	8.00	0.00
						6391200.88	2403465.62	8.00	0.00
						6391200.15	2403464.08	8.00	0.00
						6391141.00	2403362.58	8.00	0.00
						6391117.94	2403207.95	8.00	0.00
						6391139.71	2403052.79	8.00	0.00
						6391203.47	2402953.49	8.00	0.00
						6391204.17	2402952.18	8.00	0.00
						6391204.68	2402950.78	8.00	0.00
						6391204.97	2402949.32	8.00	0.00
						6391205.05	2402947.83	8.00	0.00
						6391187.79	2402422.32	8.00	0.00
						6391586.75	2402304.98	8.00	0.00
						6391588.23	2402304.41	8.00	0.00
						6391589.60	2402303.61	8.00	0.00
						6392265.11	2401837.70	8.00	0.00
						6392266.26	2401836.76	8.00	0.00
						6392267.27	2401835.67	8.00	0.00
						6392268.11	2401834.44	8.00	0.00
						6392268.75	2401833.09	8.00	0.00
						6392269.18	2401831.67	8.00	0.00
						6392269.40	2401830.20	8.00	0.00
						6392276.09	2401739.25	8.00	0.00
						6392591.85	2400483.48	8.00	0.00
						6392592.07	2400482.30	8.00	0.00
						6392592.15	2400481.09	8.00	0.00
						6392592.08	2400479.89	8.00	0.00
						6392553.02	2400143.66	8.00	0.00
						6392557.75	2399935.88	8.00	0.00
						6392557.75	2399935.48	8.00	0.00
						6392557.68	2399931.32	8.00	0.00
						6392557.50	2399929.58	8.00	0.00
						6392557.02	2399927.91	8.00	0.00
						6392556.26	2399926.34	8.00	0.00
						6392555.23	2399924.93	8.00	0.00
						6392553.98	2399923.72	8.00	0.00
						6392552.53	2399922.74	8.00	0.00
						6392550.94	2399922.03	8.00	0.00
						6392549.25	2399921.61	8.00	0.00
						6392547.51	2399921.49	8.00	0.00
						6392545.78	2399921.67	8.00	0.00
						6392544.10	2399922.15	8.00	0.00
						6392542.53	2399922.91	8.00	0.00
						6392541.12	2399923.94	8.00	0.00
						6392539.91	2399925.19	8.00	0.00
						6392538.94	2399926.64	8.00	0.00
						6392538.23	2399928.23	8.00	0.00
						6392537.80	2399929.92	8.00	0.00
						6392537.68	2399931.66	8.00	0.00
						6392537.75	2399935.63	8.00	0.00
						6392533.01	2400143.90	8.00	0.00
						6392533.01	2400144.30	8.00	0.00
						6392533.07	2400145.28	8.00	0.00
						6392572.00	2400480.38	8.00	0.00
						6392256.48	2401735.22	8.00	0.00
						6392256.31	2401736.09	8.00	0.00
						6392256.21	2401736.92	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6392249.81	2401823.95	8.00	0.00
				6391579.57	2402286.24	8.00	0.00
				6391174.72	2402405.31	8.00	0.00
				6391173.19	2402405.90	8.00	0.00
				6391171.78	2402406.73	8.00	0.00
				6391170.52	2402407.78	8.00	0.00
				6391169.46	2402409.01	8.00	0.00
				6391168.60	2402410.41	8.00	0.00
				6391167.99	2402411.93	8.00	0.00
				6391167.63	2402413.52	8.00	0.00
				6391167.54	2402415.16	8.00	0.00
				6391184.95	2402945.30	8.00	0.00
				6391121.69	2403043.83	8.00	0.00
				6391121.01	2403045.06	8.00	0.00
				6391120.52	2403046.38	8.00	0.00
				6391120.21	2403047.75	8.00	0.00
				6391097.93	2403206.60	8.00	0.00
				6391097.83	2403208.16	8.00	0.00
				6391097.94	2403209.46	8.00	0.00
				6391121.50	2403367.44	8.00	0.00
				6391121.76	2403368.67	8.00	0.00
				6391122.18	2403369.87	8.00	0.00
				6391122.75	2403371.00	8.00	0.00
				6391181.56	2403471.90	8.00	0.00
				6391186.28	2403746.31	8.00	0.00
				6391017.45	2403741.37	8.00	0.00
				6391015.85	2403741.45	8.00	0.00
				6391014.29	2403741.78	8.00	0.00
				6391012.80	2403742.36	8.00	0.00
				6391011.43	2403743.17	8.00	0.00
				6391010.19	2403744.18	8.00	0.00
				6391009.14	2403745.38	8.00	0.00
				6391008.29	2403746.73	8.00	0.00
				6391007.67	2403748.20	8.00	0.00
				6391007.28	2403749.75	8.00	0.00
				6391007.15	2403751.35	8.00	0.00
				6391005.92	2404400.99	8.00	0.00
				6390932.09	2404461.53	8.00	0.00
				6390930.90	2404462.68	8.00	0.00
				6390929.92	2404464.01	8.00	0.00
				6390929.17	2404465.48	8.00	0.00
				6390928.67	2404467.06	8.00	0.00
				6390928.44	2404468.70	8.00	0.00
				6390928.49	2404470.35	8.00	0.00
				6390928.80	2404471.97	8.00	0.00
				6390929.38	2404473.52	8.00	0.00
				6390930.20	2404474.95	8.00	0.00
				6390931.25	2404476.23	8.00	0.00
				6390932.49	2404477.31	8.00	0.00
				6390933.89	2404478.18	8.00	0.00
				6390935.42	2404478.81	8.00	0.00
				6390937.03	2404479.17	8.00	0.00
				6390938.68	2404479.27	8.00	0.00
				6390940.33	2404479.09	8.00	0.00
				6390941.92	2404478.64	8.00	0.00
				6390943.41	2404477.94	8.00	0.00
				6390944.77	2404477.00	8.00	0.00
				6391022.25	2404413.47	8.00	0.00
				6391023.32	2404412.46	8.00	0.00
				6391024.22	2404411.30	8.00	0.00
				6391024.95	2404410.02	8.00	0.00
				6391025.48	2404408.65	8.00	0.00
				6391025.80	2404407.22	8.00	0.00
SHAY_POND_PIPELINES_ZVI	0	8.00	a	6393026.81	2400486.65	8.00	0.00
				6393028.44	2400486.50	8.00	0.00
				6393030.03	2400486.08	8.00	0.00
				6393031.53	2400485.40	8.00	0.00
				6393032.89	2400484.49	8.00	0.00
				6393034.09	2400483.36	8.00	0.00
				6393035.09	2400482.06	8.00	0.00
				6393177.09	2400260.90	8.00	0.00
				6393177.90	2400259.36	8.00	0.00
				6393178.43	2400257.70	8.00	0.00
				6393178.66	2400255.97	8.00	0.00
				6393178.59	2400254.23	8.00	0.00
				6393178.22	2400252.52	8.00	0.00
				6393177.56	2400250.91	8.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						6393176.63	2400249.44	8.00	0.00
						6393175.46	2400248.15	8.00	0.00
						6393174.08	2400247.08	8.00	0.00
						6393172.53	2400246.27	8.00	0.00
						6393170.87	2400245.74	8.00	0.00
						6393169.15	2400245.51	8.00	0.00
						6393167.40	2400245.58	8.00	0.00
						6393165.70	2400245.95	8.00	0.00
						6393164.09	2400246.61	8.00	0.00
						6393162.61	2400247.54	8.00	0.00
						6393161.32	2400248.71	8.00	0.00
						6393160.26	2400250.09	8.00	0.00
						6393021.17	2400466.71	8.00	0.00
						6392591.04	2400470.95	8.00	0.00
						6392592.08	2400479.89	8.00	0.00
						6392592.15	2400481.09	8.00	0.00
						6392592.07	2400482.30	8.00	0.00
						6392591.85	2400483.48	8.00	0.00
						6392589.96	2400490.97	8.00	0.00
SHAY_POND_PIPELINES_ZVI	0	8.00	a			6392589.96	2400490.97	8.00	0.00
						6392591.85	2400483.48	8.00	0.00
						6392592.07	2400482.30	8.00	0.00
						6392592.15	2400481.09	8.00	0.00
						6392592.08	2400479.89	8.00	0.00
						6392591.04	2400470.95	8.00	0.00
						6392582.01	2400471.04	8.00	0.00
						6392580.28	2400471.22	8.00	0.00
						6392578.60	2400471.69	8.00	0.00
						6392577.03	2400472.45	8.00	0.00
						6392575.62	2400473.47	8.00	0.00
						6392574.41	2400474.71	8.00	0.00
						6392573.42	2400476.15	8.00	0.00
						6392572.71	2400477.74	8.00	0.00
						6392572.28	2400479.42	8.00	0.00
						6392572.15	2400481.16	8.00	0.00
						6392572.32	2400482.89	8.00	0.00
						6392572.79	2400484.57	8.00	0.00
						6392573.54	2400486.14	8.00	0.00
						6392574.56	2400487.56	8.00	0.00
						6392575.80	2400488.77	8.00	0.00
						6392577.24	2400489.76	8.00	0.00
						6392578.82	2400490.48	8.00	0.00
						6392580.51	2400490.91	8.00	0.00
						6392582.25	2400491.04	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates				
							Begin	x	y	z	Ground	
							(ft)	(ft)	(ft)	(ft)	(ft)	

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		

This page intentionally left blank

APPENDIX 8.3:

SAND CANYON CADNAA CONSTRUCTION NOISE MODEL INPUTS

This page intentionally left blank

15309 - Big Bear Replinishment

CadnaA Noise Prediction Model: 15309-02_Sand_canyon.cna
Date: 26.09.23
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
R6		R6	72.8	-29.5	69.8	0.0	0.0	0.0		x	Total	5.00	a	6378418.88	2389873.77	5.00
R7		R7	65.5	-34.5	62.5	0.0	0.0	0.0		x	Total	5.00	a	6381776.13	2391405.64	5.00
R8		R8	71.9	-28.1	68.9	0.0	0.0	0.0		x	Total	5.00	a	6381444.88	2391401.47	5.00
R9		R9	65.5	-34.5	62.5	0.0	0.0	0.0		x	Total	5.00	a	6380463.03	2391966.65	5.00
R10		R10	66.0	-34.1	63.0	0.0	0.0	0.0		x	Total	5.00	a	6379456.09	2392645.90	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
Pump1		Pump1	113.4	0.0	0.0	Lw	113.4					8.00	r	6378341.69	2389749.43	8.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SAND CANYON PIPELINE_ZVI		0	118.0	18.0	18.0	77.0	-23.0	-23.0	PWL-Pt	118					8	a
SAND CANYON PIPELINE_ZVI		0	118.0	18.0	18.0	88.5	-11.5	-11.5	PWL-Pt	118					0	a
Recharge Area		RA1	115.6	15.6	15.6	69.7	-30.3	-30.3	PWL-Pt	115.6					8	a

Name	ID	Height			Coordinates			
		Begin		End	x	y	z	Ground
		(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
SAND CANYON PIPELINE_ZVI	0	8.00	a		6380818.28	2391756.88	8.00	0.00
					6381040.20	2391699.69	8.00	0.00
					6381041.71	2391699.17	8.00	0.00
					6381043.11	2391698.42	8.00	0.00
					6381584.60	2391350.20	8.00	0.00
					6381691.53	2391405.30	8.00	0.00
					6381693.15	2391405.97	8.00	0.00
					6381694.85	2391406.34	8.00	0.00
					6381696.59	2391406.40	8.00	0.00
					6381698.32	2391406.17	8.00	0.00
					6381699.98	2391405.64	8.00	0.00
					6381701.52	2391404.83	8.00	0.00
					6381702.90	2391403.76	8.00	0.00
					6381704.07	2391402.47	8.00	0.00
					6381705.00	2391401.00	8.00	0.00
					6381705.66	2391399.38	8.00	0.00
					6381706.04	2391397.68	8.00	0.00
					6381706.10	2391395.94	8.00	0.00
					6381705.87	2391394.21	8.00	0.00
					6381705.34	2391392.55	8.00	0.00
					6381704.53	2391391.01	8.00	0.00
					6381703.46	2391389.63	8.00	0.00
					6381702.17	2391388.46	8.00	0.00
					6381700.70	2391387.52	8.00	0.00
					6381588.63	2391329.77	8.00	0.00
					6381587.25	2391329.19	8.00	0.00
					6381585.81	2391328.81	8.00	0.00
					6381584.32	2391328.66	8.00	0.00
					6381582.82	2391328.73	8.00	0.00
					6381581.36	2391329.03	8.00	0.00
					6381579.95	2391329.54	8.00	0.00
					6381578.64	2391330.25	8.00	0.00
					6381033.65	2391680.72	8.00	0.00
					6380818.65	2391736.13	8.00	0.00
					6380633.78	2391560.66	8.00	0.00
					6380633.61	2391560.51	8.00	0.00
					6380375.15	2391325.88	8.00	0.00
					6380485.72	2391200.48	8.00	0.00
					6380575.28	2391102.63	8.00	0.00
					6380576.33	2391101.26	8.00	0.00
					6380577.13	2391099.73	8.00	0.00
					6380577.65	2391098.08	8.00	0.00
					6380577.89	2391096.36	8.00	0.00
					6380583.93	2390971.26	8.00	0.00
					6380583.88	2390969.62	8.00	0.00
					6380583.55	2390968.01	8.00	0.00
					6380534.47	2390797.48	8.00	0.00
					6380581.12	2390640.13	8.00	0.00
					6380581.44	2390638.68	8.00	0.00
					6380581.53	2390637.19	8.00	0.00
					6380581.40	2390635.70	8.00	0.00
					6380566.86	2390545.48	8.00	0.00
					6380566.59	2390544.29	8.00	0.00
					6380566.18	2390543.14	8.00	0.00
					6380565.63	2390542.05	8.00	0.00
					6380512.11	2390449.94	8.00	0.00
					6380571.25	2390336.27	8.00	0.00
					6380571.78	2390335.05	8.00	0.00
					6380572.15	2390333.78	8.00	0.00
					6380572.34	2390332.47	8.00	0.00
					6380572.36	2390331.15	8.00	0.00
					6380556.11	2390004.72	8.00	0.00
					6380555.89	2390003.08	8.00	0.00
					6380555.41	2390001.50	8.00	0.00
					6380554.67	2390000.03	8.00	0.00
					6380553.70	2389998.69	8.00	0.00
					6380552.52	2389997.53	8.00	0.00
					6380551.17	2389996.58	8.00	0.00
					6380549.68	2389995.87	8.00	0.00
					6380548.09	2389995.41	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6380546.45	2389995.22	8.00	0.00
				6380207.34	2389983.83	8.00	0.00
				6380020.65	2389923.10	8.00	0.00
				6380019.24	2389922.75	8.00	0.00
				6380017.79	2389922.61	8.00	0.00
				6380016.34	2389922.68	8.00	0.00
				6380014.92	2389922.96	8.00	0.00
				6380013.55	2389923.44	8.00	0.00
				6379771.14	2390029.42	8.00	0.00
				6379769.90	2390030.06	8.00	0.00
				6379768.77	2390030.87	8.00	0.00
				6379767.76	2390031.83	8.00	0.00
				6379766.89	2390032.93	8.00	0.00
				6379657.05	2390193.28	8.00	0.00
				6379505.79	2390388.69	8.00	0.00
				6379504.95	2390389.96	8.00	0.00
				6379504.65	2390390.54	8.00	0.00
				6379419.68	2390570.33	8.00	0.00
				6379295.75	2390521.79	8.00	0.00
				6379307.61	2390299.64	8.00	0.00
				6379307.62	2390298.93	8.00	0.00
				6379307.56	2390297.98	8.00	0.00
				6379277.86	2390034.18	8.00	0.00
				6379277.55	2390032.58	8.00	0.00
				6379276.98	2390031.06	8.00	0.00
				6379276.17	2390029.64	8.00	0.00
				6379275.15	2390028.38	8.00	0.00
				6379273.93	2390027.30	8.00	0.00
				6379272.55	2390026.43	8.00	0.00
				6379271.05	2390025.80	8.00	0.00
				6379269.47	2390025.42	8.00	0.00
				6379267.85	2390025.30	8.00	0.00
				6378739.79	2390029.11	8.00	0.00
				6378738.14	2390029.27	8.00	0.00
				6378736.55	2390029.69	8.00	0.00
				6378735.04	2390030.37	8.00	0.00
				6378733.67	2390031.29	8.00	0.00
				6378636.96	2390108.42	8.00	0.00
				6378635.82	2390109.48	8.00	0.00
				6378634.86	2390110.71	8.00	0.00
				6378634.10	2390112.07	8.00	0.00
				6378633.56	2390113.54	8.00	0.00
				6378633.26	2390115.07	8.00	0.00
				6378607.08	2390337.59	8.00	0.00
				6378607.01	2390339.08	8.00	0.00
				6378607.17	2390340.55	8.00	0.00
				6378607.55	2390341.99	8.00	0.00
				6378648.14	2390460.90	8.00	0.00
				6378597.42	2390512.35	8.00	0.00
				6378478.70	2390395.34	8.00	0.00
				6378275.78	2390181.54	8.00	0.00
				6378275.55	2390181.30	8.00	0.00
				6378268.55	2390174.40	8.00	0.00
				6378267.28	2390173.35	8.00	0.00
				6378265.86	2390172.51	8.00	0.00
				6378264.32	2390171.92	8.00	0.00
				6378262.70	2390171.59	8.00	0.00
				6378261.05	2390171.54	8.00	0.00
				6378259.41	2390171.75	8.00	0.00
				6378257.83	2390172.24	8.00	0.00
				6378256.35	2390172.97	8.00	0.00
				6378255.01	2390173.94	8.00	0.00
				6378253.85	2390175.12	8.00	0.00
				6378252.90	2390176.47	8.00	0.00
				6378252.19	2390177.96	8.00	0.00
				6378251.73	2390179.55	8.00	0.00
				6378251.54	2390181.19	8.00	0.00
				6378251.62	2390182.84	8.00	0.00
				6378251.97	2390184.45	8.00	0.00
				6378252.58	2390185.98	8.00	0.00
				6378253.43	2390187.40	8.00	0.00
				6378254.51	2390188.65	8.00	0.00
				6378261.39	2390195.43	8.00	0.00
				6378464.31	2390409.23	8.00	0.00
				6378464.54	2390409.47	8.00	0.00
				6378590.50	2390533.62	8.00	0.00
				6378591.85	2390534.73	8.00	0.00

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
				6378593.36	2390535.59	8.00	0.00
				6378595.00	2390536.17	8.00	0.00
				6378596.72	2390536.46	8.00	0.00
				6378598.47	2390536.45	8.00	0.00
				6378600.18	2390536.14	8.00	0.00
				6378601.82	2390535.53	8.00	0.00
				6378603.32	2390534.65	8.00	0.00
				6378604.65	2390533.52	8.00	0.00
				6378666.72	2390470.54	8.00	0.00
				6378667.74	2390469.33	8.00	0.00
				6378668.55	2390467.97	8.00	0.00
				6378669.14	2390466.51	8.00	0.00
				6378669.49	2390464.97	8.00	0.00
				6378669.60	2390463.39	8.00	0.00
				6378669.46	2390461.81	8.00	0.00
				6378669.06	2390460.28	8.00	0.00
				6378627.21	2390337.68	8.00	0.00
				6378652.65	2390121.49	8.00	0.00
				6378743.44	2390049.09	8.00	0.00
				6379258.99	2390045.36	8.00	0.00
				6379287.59	2390299.40	8.00	0.00
				6379275.39	2390527.94	8.00	0.00
				6379275.43	2390529.50	8.00	0.00
				6379275.71	2390531.04	8.00	0.00
				6379276.23	2390532.51	8.00	0.00
				6379276.97	2390533.89	8.00	0.00
				6379277.92	2390535.13	8.00	0.00
				6379279.05	2390536.21	8.00	0.00
				6379280.33	2390537.10	8.00	0.00
				6379281.73	2390537.78	8.00	0.00
				6379421.09	2390592.36	8.00	0.00
				6379422.68	2390592.84	8.00	0.00
				6379424.34	2390593.04	8.00	0.00
				6379426.01	2390592.97	8.00	0.00
				6379427.64	2390592.62	8.00	0.00
				6379429.19	2390592.00	8.00	0.00
				6379430.61	2390591.14	8.00	0.00
				6379431.88	2390590.05	8.00	0.00
				6379432.94	2390588.76	8.00	0.00
				6379433.78	2390587.32	8.00	0.00
				6379522.27	2390400.07	8.00	0.00
				6379673.05	2390205.30	8.00	0.00
				6379673.39	2390204.83	8.00	0.00
				6379781.77	2390046.59	8.00	0.00
				6380018.08	2389943.30	8.00	0.00
				6380202.50	2390003.29	8.00	0.00
				6380204.02	2390003.66	8.00	0.00
				6380205.25	2390003.78	8.00	0.00
				6380536.59	2390014.90	8.00	0.00
				6380552.25	2390329.44	8.00	0.00
				6380491.83	2390445.59	8.00	0.00
				6380491.18	2390447.14	8.00	0.00
				6380490.80	2390448.77	8.00	0.00
				6380490.70	2390450.44	8.00	0.00
				6380490.88	2390452.11	8.00	0.00
				6380491.34	2390453.72	8.00	0.00
				6380492.05	2390455.23	8.00	0.00
				6380547.40	2390550.50	8.00	0.00
				6380561.29	2390636.63	8.00	0.00
				6380514.46	2390794.59	8.00	0.00
				6380514.16	2390795.98	8.00	0.00
				6380514.05	2390797.40	8.00	0.00
				6380514.15	2390798.81	8.00	0.00
				6380514.44	2390800.20	8.00	0.00
				6380563.87	2390971.95	8.00	0.00
				6380558.08	2391091.79	8.00	0.00
				6380470.84	2391187.12	8.00	0.00
				6380353.63	2391320.04	8.00	0.00
				6380352.60	2391321.43	8.00	0.00
				6380351.83	2391322.98	8.00	0.00
				6380351.33	2391324.63	8.00	0.00
				6380351.13	2391326.35	8.00	0.00
				6380351.23	2391328.07	8.00	0.00
				6380351.62	2391329.75	8.00	0.00
				6380352.29	2391331.34	8.00	0.00
				6380353.23	2391332.79	8.00	0.00
				6380354.41	2391334.06	8.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						6380620.09	2391575.24	8.00	0.00
						6380808.90	2391754.45	8.00	0.00
						6380810.21	2391755.50	8.00	0.00
						6380811.68	2391756.32	8.00	0.00
						6380813.27	2391756.87	8.00	0.00
						6380814.93	2391757.16	8.00	0.00
						6380816.62	2391757.16	8.00	0.00
SAND CANYON PIPELINE_ZVI	0	0.00	a			6378337.87	2389749.79	0.00	0.00
						6378336.17	2389749.67	0.00	0.00
						6378334.47	2389749.83	0.00	0.00
						6378332.83	2389750.29	0.00	0.00
						6378331.29	2389751.01	0.00	0.00
						6378329.89	2389751.99	0.00	0.00
						6378328.68	2389753.19	0.00	0.00
						6378327.69	2389754.57	0.00	0.00
						6378326.95	2389756.11	0.00	0.00
						6378288.77	2389856.43	0.00	0.00
						6378288.32	2389857.96	0.00	0.00
						6378288.12	2389859.54	0.00	0.00
						6378288.18	2389861.13	0.00	0.00
						6378288.49	2389862.69	0.00	0.00
						6378338.63	2390041.45	0.00	0.00
						6378253.09	2390176.17	0.00	0.00
						6378252.29	2390177.71	0.00	0.00
						6378251.76	2390179.38	0.00	0.00
						6378251.54	2390181.11	0.00	0.00
						6378251.62	2390182.85	0.00	0.00
						6378252.00	2390184.55	0.00	0.00
						6378252.67	2390186.16	0.00	0.00
						6378253.61	2390187.63	0.00	0.00
						6378254.79	2390188.91	0.00	0.00
						6378256.17	2390189.97	0.00	0.00
						6378257.72	2390190.77	0.00	0.00
						6378259.38	2390191.29	0.00	0.00
						6378261.11	2390191.52	0.00	0.00
						6378262.85	2390191.44	0.00	0.00
						6378264.55	2390191.06	0.00	0.00
						6378266.16	2390190.39	0.00	0.00
						6378267.63	2390189.45	0.00	0.00
						6378268.91	2390188.27	0.00	0.00
						6378269.97	2390186.89	0.00	0.00
						6378357.91	2390048.41	0.00	0.00
						6378358.68	2390046.92	0.00	0.00
						6378359.20	2390045.33	0.00	0.00
						6378359.45	2390043.67	0.00	0.00
						6378359.41	2390041.99	0.00	0.00
						6378359.09	2390040.34	0.00	0.00
						6378308.64	2389860.47	0.00	0.00
						6378345.65	2389763.22	0.00	0.00
						6378346.10	2389761.67	0.00	0.00
						6378346.29	2389760.07	0.00	0.00
						6378346.23	2389758.46	0.00	0.00
						6378345.90	2389756.88	0.00	0.00
						6378345.33	2389755.37	0.00	0.00
						6378344.52	2389753.97	0.00	0.00
						6378343.50	2389752.72	0.00	0.00
						6378342.29	2389751.66	0.00	0.00
						6378340.92	2389750.80	0.00	0.00
						6378339.43	2389750.17	0.00	0.00
Recharge Area	RA1	8.00	a			6381760.75	2391392.47	8.00	0.00
						6381678.63	2391308.15	8.00	0.00
						6381268.62	2391682.13	8.00	0.00
						6380673.54	2391981.81	8.00	0.00
						6380478.22	2392010.02	8.00	0.00
						6380115.53	2392014.11	8.00	0.00
						6379379.05	2392497.22	8.00	0.00
						6379102.52	2392639.46	8.00	0.00
						6379188.88	2392782.33	8.00	0.00
						6380158.13	2392166.27	8.00	0.00
						6380511.83	2392124.98	8.00	0.00
						6380691.14	2392132.02	8.00	0.00
						6381377.75	2391764.80	8.00	0.00
						6381637.08	2391538.02	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph)

Sound Level Spectra

Name	ID	Type	Oktave Spectrum (dB)											Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height				Coordinates				Dist	LSlope
	Begin		End		x	y	z	Ground	(ft)	(%)
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)		