APPENDIX T NOISE IMPACT ANALYSIS

Noise Impact Analysis

El Monte Sand Mining Project

Community of Lakeside

San Diego County, California

County of San Diego Record ID: PDS2015-MUP-98-014W2/ PDS2015-RP-15-001; Environmental Log No: PDS2015-MUP-98-014W2 and PDS2015-RP-15-001

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July 2018

EXECUTIVE SUMMARY

This noise impact analysis has been prepared to evaluate the potential noise impacts and mitigation measures associated with the proposed El Monte Sand Mining Project (proposed project) in the unincorporated community of Lakeside, in San Diego County (County), California.

The primary existing noise sources in the project area are transportation facilities. Traffic on El Monte Road, Willow Road, and State Route 67 (SR-67) in the project vicinity is the source of ambient noise in the project vicinity. The proposed project is expected to result in worker commutes and equipment transport noise impacts which would not be substantial.

As described in more detail below in Section 2.1, both the construction activities and the operational activities will be analyzed based on the appropriate standards in the County of San Diego Noise Ordinance. The construction-related noise impact criteria utilize an 8-hour L_{eq} as compared to operational noise impacts, which utilize a 1-hour L_{eq}. It is assumed for the purposes of this analysis that construction-related noise impacts would emit the same hourly average noise level over the duration of daily construction activities; therefore, the hourly-noise level calculated for site-preparation construction activities in this analysis will be the same for the 8-hour L_{eq}.

Construction and operation-related activities associated with the proposed project will likely increase the ambient noise levels in the project vicinity. However, the proposed construction and operational activities would not result in adjacent residents being exposed to noise levels that would exceed the County's exterior and/or interior noise standards. There will be no impulsive operations such as blasting or pile driving as part of this project; therefore, information on the impulsive noise standards will be provided for reference purposes only.

S.1 Construction Site Preparation and Operational Noise Impacts

The following measures can be implemented to reduce potential construction and operation-related noise impacts on nearby sensitive receptors:

- All operations will be limited to the hours of 7:00 a.m. to 5:00 p.m. on any working day except Sundays and holidays, in accordance with the Major Use Permit (MUP) for the proposed project, and is consistent with the San Diego County Code of Regulatory Ordinance, Chapter 4 Noise Abatement and Control, Section 36.404 General Sound Level Limits, daytime hours. Noise levels shall not exceed an equivalent continuous sound level of 75 dBA (dBA) equivalent continuous sound level (L_{eq}) for any hour at the project boundary. No activities are permitted outside of these hours or on Sundays and holidays.
- During all activities, the project contractors shall equip all equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.

- The project contractor shall place all stationary equipment so that emitted noise is directed away from sensitive receptors nearest the project site where feasible.
- The contractors shall locate equipment staging in areas that will create the greatest distance between operations-related noise sources and the noise-sensitive receptors nearest the project site during all project operations.
- During the site preparation construction phase, the project contractor on site shall require all activities occur a minimum of 120 feet from the project boundaries.
- During the excavation and reclamation operational phases, the project contractor on site shall require all activities occur a minimum of 150 feet from the project boundaries.
- During the processing plant operational phases, the project contractor on site shall require all activities occur a minimum of 170 feet from the project boundaries.
- When processing plant operations occur in the southwest corner of the property site, equipment must remain a distance of 100 feet or more from the 8-foot high berm, which is a project feature.

S.2 Traffic Noise Impacts

No mitigation measures are required for traffic noise because the equipment transport and worker commutes would not be substantial.

S.3 Vibration-Related Impacts

No mitigation measures are required because the vibration impacts created by the equipment utilized as part of this project for construction and operational activities would not be substantial.

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LIST OF ACRONYMS

APN	Assessor's Parcel Number
bgs	Below ground surface
Caltrans	California Department of Transportation
CNEL	Community Noise Equivalent Level
County	San Diego County
dB	decibels
dBA	A-weighted decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
in/sec	Inches per second
L_{10}	noise level exceeded 10 percent of the time during a stated period
L_{50}	noise level representing the median noise level; half the time the noise level exceeds this level and half the time it is less than this level
L_{90}	noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum noise level
LSA	LSA Associates, Inc.
Lv	velocity in decibels
MUP	Major Use Permit
PCC	Portland Cement Concrete
PPV	peak- particle velocity
Proponent	El Monte Nature Preserve, L.L.C.
proposed project	El Monte Sand Mining Project
RMS	root-mean-square
RP	Reclamation Plan
SLM	sound level meter
SMARA	California Surface Mining and Reclamation Act of 1975
SPL	sound pressure level

SR-67	State Route 67
USGS	U.S. Geological Survey
VdB	velocity in decibels
Vref	the reference velocity amplitude, or 1×10^{-6} inches/second (in/sec) used in the United States

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

El Monte Nature Preserve, L.L.C. (applicant) is proposing the El Monte Sand Mining Project (project). The proposed project would produce 12.5 million tons of mineral resources over a 12-year period in El Monte Valley on land that is zoned for extractive use. As mining is completed in phases, the disturbed areas previously mined will be progressively reclaimed starting in year 4 of the project and restored to an end use of open space with recreational trail easements. The combined mineral extraction and reclamation project will affect approximately 262 acres of land in El Monte Valley on approximately 479.5 acres currently owned by El Monte Nature Preserve, LLC. Figure 1 depicts the project's regional location. Table A presents the acres disturbed within each Assessor's Parcel Number (APN). Table B presents the mining phase acreages and expected dates of operation and completion.

Table A: Assessor's Parcels

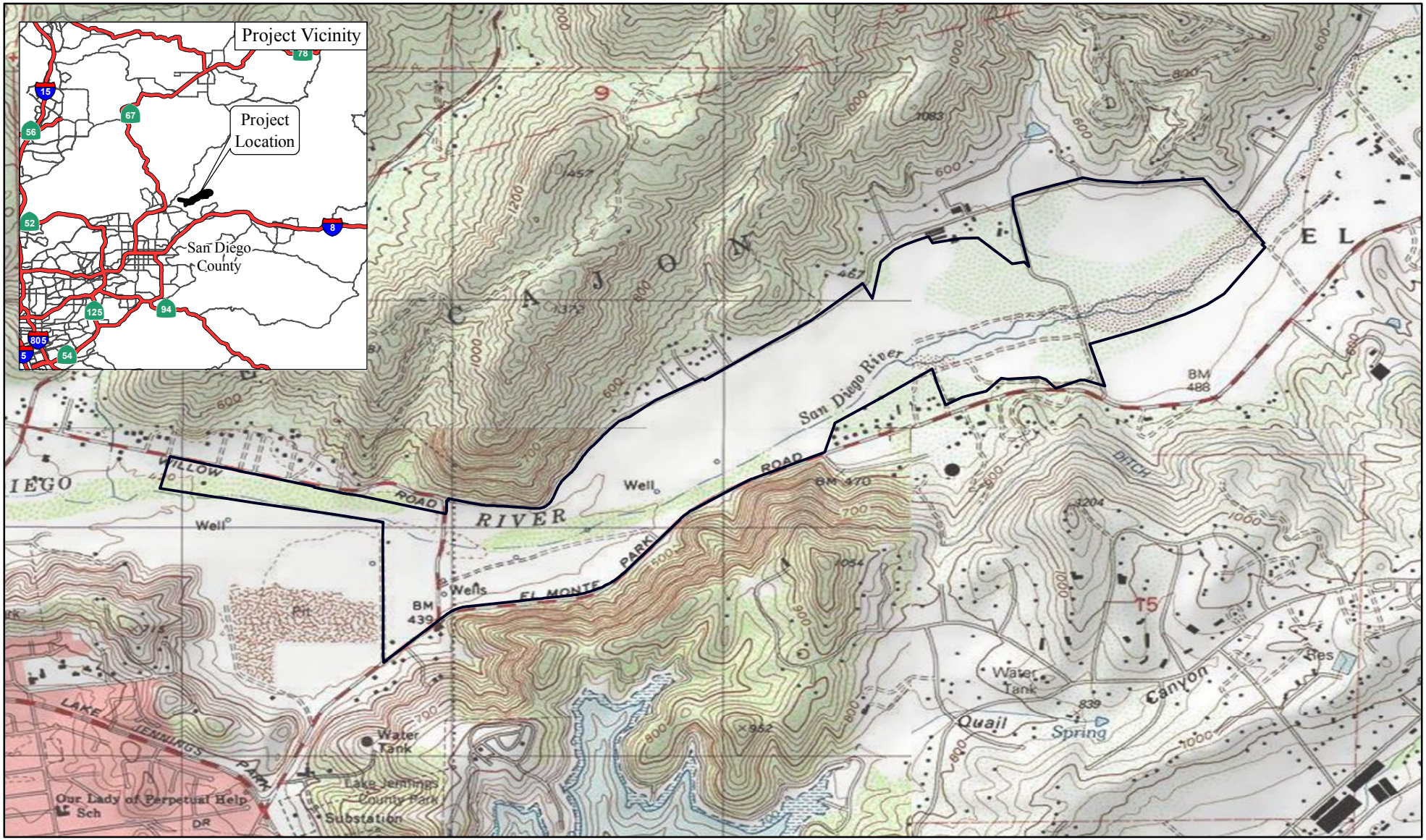
APN	Total Area of Each APN (acres)	Total Acres in MUP Boundary	Disturbed Area (acres)	Owner	Zoning[1]
390-040-51	128.4	112.0	12.3	El Monte Nature Preserve, LLC	S-82, A-70
391-061-01	488.6	199.9	123.2	El Monte Nature Preserve, LLC	S-82
391-071-04	91.3	89.5	69.0	El Monte Nature Preserve, LLC	S-82
329-060-29	65.5	21.6	7.8	El Monte Nature Preserve, LLC	S-82
392-150-17	29.3	28.8	21.9	El Monte Nature Preserve, LLC	S-82
393-011-01	27.5	27.8	9.1	El Monte Nature Preserve, LLC	S-82, A-70

Source: EnviroMINE (2018)
APN = Assessor's Parcel Number
[1]S-82, Extractive Use, Minimum Lot Size: 8 acres, Special Area Regulation: F, S
A-70, Agricultural Use, Minimum Lot Size: 4 acres/8 acres, Special Area Regulation: F, S/S

Table B: Proposed Mining and Reclamation Completion Dates

Mining Phase	Area Affected within Mining Footprint (acres)*	Mining Duration (years)	Mining Initiation Date (est)	Mining Completion Date (est)	Reclamation Duration (years)	Reclamation Completion Date (est)
1	93	4	2019	2023	4	2027
2	52	3	2023	2026	4	2030
3	48	3	2026	2029	4	2033
4	50	2	2029	2031	4	2035
Total	**243**	**12**	**—**	**—**	**16**	**—**

est = estimated
* Rounded to the nearest acre, including mining areas, trails, and staging areas within the mining footprint. Approximately 19 acres of the project site are impacted by trails and fuel modification outside of the mining footprint, for a total of 262 acres impacted.



LSA

LEGEND

Project Boundary

FIGURE 1

N

0 1000 2000

FEET

SOURCE: USGS 7.5' Quad., *San Vicente Reservior, CA* (1971); *El Cajon Mtn, CA* (1988); *El Cajon, CA* (1975); *Alpine, CA* (1988); ESA (2016)

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El Monte Sand Mining Project

Project Vicinity

The proposed project includes the modification of an existing MUP (PDS2015-MUP-98-014W2), which allows development and operation of an existing golf course complex. The MUP would be modified to eliminate the golf course use and allow extraction of construction aggregates. In addition, a Reclamation Plan (PDS2015-RP-15-001) is required for the proposed project in compliance with the California Surface Mining and Reclamation Act of 1975 (SMARA).

Approximately 262 acres will be affected by mining and reclamation activities, including backfilling and reclaiming of about 15 acres of dry depressions pond built by the golf course. Areas disturbed by the operation will be progressively reclaimed starting in year 4 as mining proceeds to the west. Reclamation is an ongoing process that commences when mining operations have ceased within a given area and continues until all mining-related disturbance has been reclaimed and all equipment involved in these operations has been removed.

The project is expected to be fully completed in 16 years; i.e., mining will be ongoing for 12 years. Reclamation will commence 4 years after the start of mining and will continue over a 16 year period. As such, reclamation is expected to be concluded 4 years after the completion of mining. Associated activities include a permanent and mobile processing plant, all support structures and buildings in the form of scales, scale house module and storage containers. Setbacks of at least 75 feet in width will be established along El Monte Road and Willow Road prior to commencing operations. At maximum production, approximately 231 truckloads per day would exit the site with a similar number of trucks entering the site each day. Sand excavation and trucking operations would occur on weekdays between the hours of 7:00 a.m. and 5:00 p.m.

The requested MUP modification would eliminate the approved golf course use and authorize a maximum production limit of 157 one-way heavy vehicle trips of construction grade aggregate per day. Excavated material will total 13.5 million tons with approximately 12.5-million tons of construction aggregate produced and 1.0 million tons of overburden retained onsite. A portion of the produced material will be washed for concrete sand and the rest would be used as backfill fill in the depression area and for construction of the final topography.

Mining would begin with site preparation and progress in a series of westerly advancing phases (Phases 1 through 4). Site preparation would establish a pad for the permanent and mobile processing plants approximately 10 feet below the existing ground surface (bgs) located in the southwestern and northeastern segment of the excavation area. Earthen berms would be constructed around the top sides of the permanent plant area to screen the equipment and operation from public views. Temporary power lines and the processing plant equipment would also be installed. A two-lane, on-site access road from El Monte Road to the plant would be excavated to approximately 10–12 feet bgs to accommodate over-the-road truck access to the plant/loading area. Site preparation would also include the installation of a channel erosion control structure (drop structure) on the eastern edge of the project site. This drop structure will be located approximately

300 feet west of Dairy Road and will serve as an erosion control device to prevent head cutting of the San Diego River channel to the east. Site preparation is anticipated to occur for approximately 30 days.

Throughout Phase 1 through 4, wheeled, front-end-loaders will mine the materials to approximately 4 feet above the water table. The wheeled loaders will move the mined materials directly to the processing plant located near the active cut. The processing plant will be relocated multiple times as the project proceeds west in order to minimize haul distances.

Reclamation will progress with mining and will consist of grading the edges of the pit to develop a 20-foot wide bench 10 feet below the current ground surface. This bench will support Coastal Sage Scrub vegetative habitat that is present in the area and eventually provide for a public trail network. The bench will be approximately 20-feet wide with 20 feet of a gently sloped to flat surface separated by a 10-foot high slope above the bench surface and a 20-foot high slope below the bench, both at 3H:1V gradient. This bench will be developed on a continuing basis as the mining operation proceeds westward. After final grading, a top dressing of wash fines and salvaged topsoil will be applied, incorporated into the surface by ripper or disc and planted with a Coastal Sage Scrub seed mix on the bench and slopes. Final grading will begin after mining is complete within a given area and extractive operations proceed to the west. Planting of graded areas will be conducted as final landforms are established and become available for revegetation. This process will continue throughout the duration of the project.

Trail easements have been identified on the Plot Plan to provide opportunities for riding and hiking along the periphery of the project site. After completion of mining and final reclamation, the proposed end use for the property is undeveloped revegetated open space with recreational trail easements.

The Site Plan and Mine Phasing are presented as Figures 2 and 3, respectively.

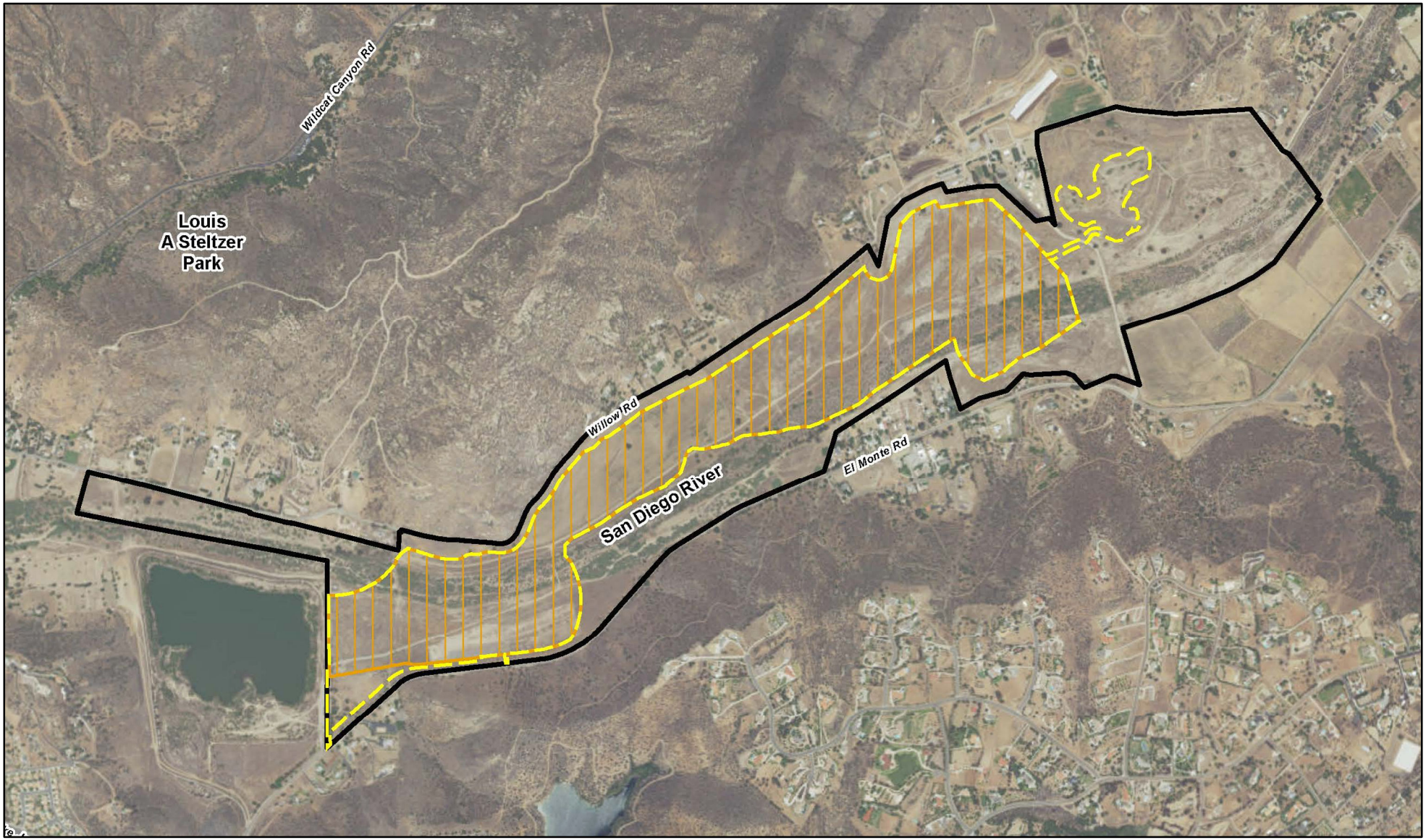
1.2 ENVIRONMENTAL SETTINGS AND EXISTING CONDITIONS

1.2.1 Noise Terminology

1.2.1.1 Characteristics of Sound

Sound is increasing in the environment and can affect quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is related to the frequency of the sound, while loudness is related to amplitude or level of the sound. Pitch is the number of complete vibrations, or cycles per second, of a wave, resulting in the tone's range from high to low; it is measured by the frequency of the sound wave in Hertz (Hz). Loudness is the strength of a sound and describes a noisy or



LSA

LEGEND

- Project Site (MUP Boundary)
- Limits of Disturbance
- Limits of Mining Activities

FIGURE 2

0 750 1500
FEET

SOURCE: ESRI (2017); ESA (2016)

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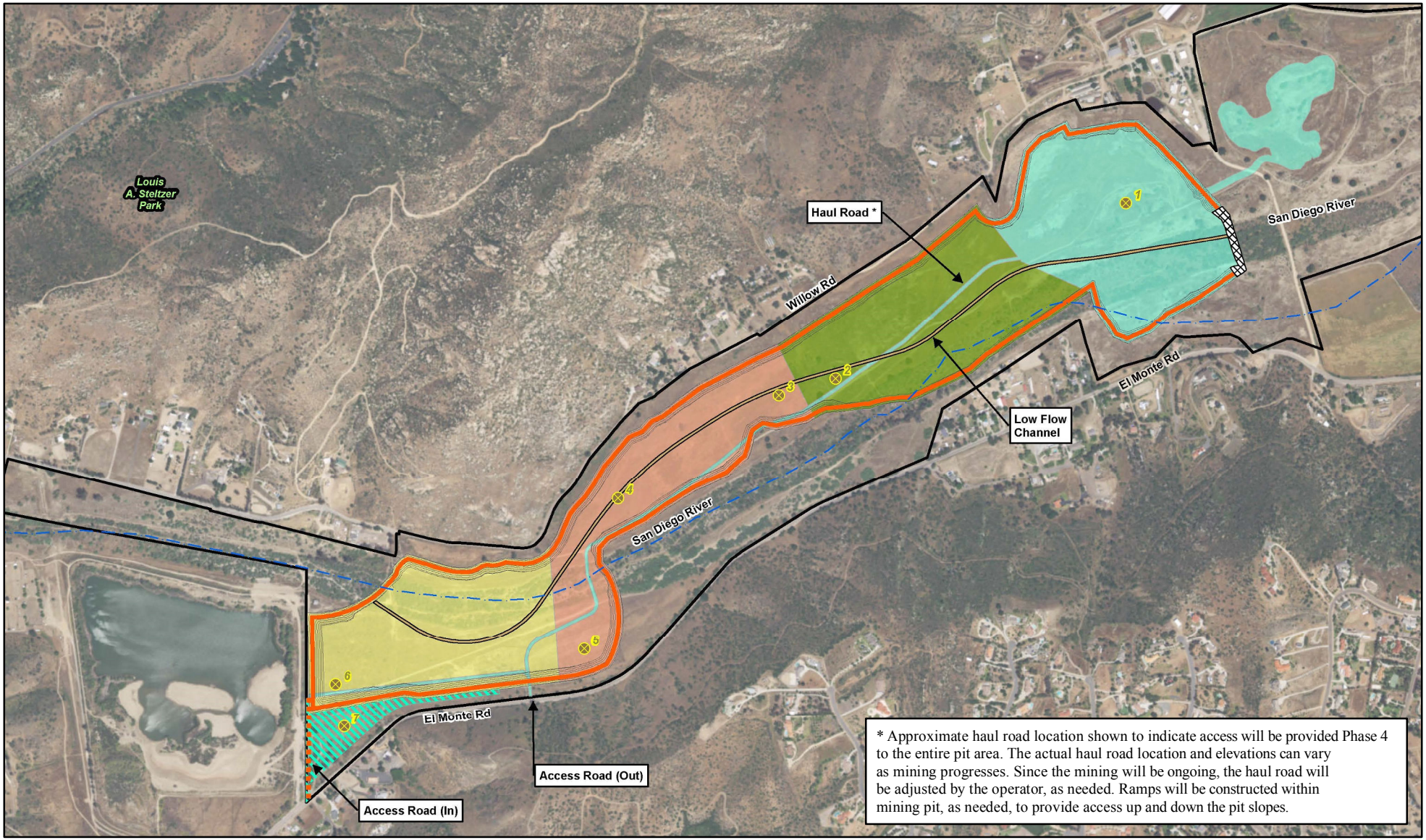
El Monte Sand Mining Project

Affected Area



LSA

FIGURE 3

LEGEND

- Project Site (MUP Boundary)
- 25' Wide Low Flow Channel
- Processing Area (part of Phase I)
- 20' Wide Slope Bench
- Drop Structure
- Existing Access Road
- Proposed Pit Slope
- Processing Plant Locations

Site Plan Phasing

- Phase 1
- Phase 2
- Phase 3
- Phase 4

N

0 600 1200
FEET

SOURCE: NAIP (2014); ESA (2016)

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El Monte Sand Mining Project

Project Phasing

quiet environment; it is measured by the amplitude (pressure) of the sound wave in decibels (dB). Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity has a direction (or vector) and refers to how much energy is flowing through a unit area in a specified direction; it is measured in watts per unit area. All of these characteristics of sound can be precisely measured with a sound level meter (SLM) and/or sound intensity probe.

The noise environment of the project area is described in terms of sound pressure level (SPL) and its effect on adjacent sensitive land uses.

1.2.1.2 Measurement of Sound

SPL is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units, such as inches or pounds, decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 dB is 10 times more intense than 1 dB, 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Thirty (30) dB represents 1,000 times more acoustic energy than 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single-point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dB for each doubling of distance in a hard site environment. Line-source noise, when produced within a relatively flat environment with absorptive vegetation, decreases 4.5 dB for each doubling of distance from the source.

There are many ways to rate fluctuating noise levels for various time periods. L_{eq} is the noise level of a steady sound which, in a stated time period, has the same A-weighted sound energy as the time-varying sound. However, the predominant rating scales for communities in the State of California are the L_{eq} and the Community Noise Equivalent Level (CNEL), or the day-night average noise level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the

adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoyance aspects of intermittent noise.

Another noise scale often used together with the L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category is audible impacts, which refers to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater, since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

1.2.1.3 Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions and thereby affecting blood pressure and functions of the heart and nervous system. In comparison, extended periods of noise exposure above 90 dBA result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dBA will result in dizziness and loss of equilibrium.

The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

Table C lists definitions of acoustical terms. Table D shows common sound levels and their noise sources.

Table C: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very-low- and very-high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted unless reported otherwise.
L_{02}, L_{08}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: Acoustical Society of America. *Handbook of Acoustical Measurements and Noise Control* Harris. Cyril M., ed. (1998).
L_{02} = The noise level exceeded 2 percent of the time during a stated period.
L_{08} = The noise level exceeded 8 percent of the time during a stated period.
L_{50} = The noise level representing the median noise level; half the time the noise level exceeds this level and half the time it is less than this level.
L_{90} = The noise level exceeded 90 percent of the time during a stated time period and considered the lowest noise level experienced during a monitoring period; normally referred to as the background noise level.
L_{max} = maximum instantaneous noise level
L_{min} = minimum instantaneous noise level

Table D: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near jet engine	140	Deafening	128 times as loud
Civil defense siren	130	Threshold of pain	64 times as loud
Hard rock band	120	Threshold of feeling	32 times as loud
Accelerating motorcycle at a few feet away	110	Very loud	16 times as loud
Pile driver; noisy urban street/ heavy city traffic	100	Very loud	8 times as loud
Ambulance siren; food blender	95	Very loud	
Garbage disposal	90	Very loud	4 times as loud
Freight cars; living room music	85	Loud	
Pneumatic drill; vacuum cleaner	80	Loud	2 times as loud
Busy restaurant	75	Moderately loud	
Nearby freeway auto traffic	70	Moderately loud	Reference level
Average office	60	Quiet	½ as loud
Suburban street	55	Quiet	
Light traffic; soft radio music in apartment	50	Quiet	¼ as loud
Large transformer	45	Quiet	
Average residence without stereo playing	40	Faint	⅛ as loud
Soft whisper	30	Faint	
Rustling leaves	20	Very faint	
Human breathing	10	Very faint	Threshold of hearing
	0	Very faint	

Source: Compiled by LSA Associates, Inc. (2004).

1.2.1.4 Vibration

Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernable, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source and moves through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation and moves through the remainder of the structure. Building vibration may be perceived by the occupants as motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumble noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Building damage is not a factor for normal projects, with the occasional exception of blasting and pile driving operations which will not be included in this project. Annoyance from vibration often occurs when the vibration

exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of groundborne vibration are operating heavy duty earthmoving equipment, steel-wheeled trains, and occasional traffic on rough roads. Problems with groundborne vibration and noise from these sources are usually localized to areas within approximately 100 feet from the vibration source, although there are examples of groundborne vibration causing interference out to distances greater than 200 feet (Federal Transit Administration [FTA], *Transit Noise and Vibration Impact Assessment* [May 2006]). When roadways are smooth, vibration from traffic (even heavy trucks) is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that groundborne vibration from street traffic will not exceed the impact criteria; however, the mining operations could result in groundborne vibration that could be perceptible and annoying. Groundborne noise is not likely to be a problem because noise arriving via the normal airborne path usually will be greater than groundborne noise.

Groundborne vibration has the potential to disturb people as well as cause damage to buildings. Although it is very rare for train-induced groundborne vibration to cause even cosmetic building damage, it is not uncommon for processes such as blasting and pile driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2006). Groundborne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak- particle velocity (PPV). The RMS velocity is best for characterizing human response to building vibration and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 30 \log_{10} [V/V_{ref}]$$

Where: L_v = velocity in decibels (VdB)
V = root-mean-square (RMS) velocity amplitude
V_{ref} = the reference velocity amplitude, or 1×10^{-6} inches/second (in/sec) used in the United States

Table E illustrates human response to various vibration levels, as described in the *Transit Noise and Vibration Impact Assessment* (FTA 2006).

Table E: Human Response to Different Levels of Groundborne Noise and Vibration

Vibration Velocity Level	Noise Level		Human Response
	Low Frequency[1]	Mid Frequency[2]	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible; mid-frequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level unacceptable. Low-frequency noise acceptable for sleeping areas; mid-frequency noise annoying in most quiet, occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise unacceptable for sleeping areas; mid-frequency noise unacceptable even for infrequent events with institutional land uses such as schools and churches.

Source: Federal Transit Administration (2006).
[1] Approximate noise level when vibration spectrum peak is near 30 Hz.
[2] Approximate noise level when vibration spectrum peak is near 60 Hz.
dBA = A-weighted decibels
Hz = Hertz
VdB = velocity in decibels

Factors that influence groundborne vibration and noise include the following:

- **Vibration Source:** Vehicle suspension, wheel types and condition, track/roadway surface, track support system, speed, transit structure, and depth of vibration source.
- **Vibration Path:** Soil type, rock layers, soil layering, depth to water table, and frost depth.
- **Vibration Receiver:** Foundation type, building construction, and acoustical absorption.

Among the factors listed above, there are significant differences in the vibration characteristics when the source is underground compared to when it is at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock.

Groundborne vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock concentrates the vibration energy close to the surface and can result in groundborne vibration problems at large distances from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

1.2.2 Settings and Location

The site is situated within the San Diego River watershed and in the floodplain of the San Diego River, which flows through the central part of the properties. It is located parallel to El Monte Road and Willow Road in the unincorporated Lakeside area of San Diego County.

The entrance to the project site is 0.5 mile northeast of the intersection of El Monte Road and Lake Jennings Park Road. El Monte Road will serve as the route used by the project and also serves as the primary route to the Van Ommering Dairy Farm, El Monte County Park, and the El Capitan Reservoir. Residents use both El Monte and Willow Roads to access their properties. The project is located within portions of Sections 9, 10, and 16, Township 15 South, Range 1 East of the *El Cajon Mountain, California* U.S. Geological Survey (USGS) 7.5-minute quadrangle, San Bernardino Base and Meridian, County of San Diego, California, at approximately 32°52' 38.53" N latitude -116° 52' 50.00 W longitude.

The proposed project is set within the El Monte Valley, approximately 2 miles east of Lakeside. Existing conditions find a variety of land uses in the project vicinity. Land uses include rural residential, dairy farming, extractive, field and orchard crops and open space. Existing land uses are of low intensity with the valley exhibiting a rural residential/agricultural setting. Land use is limited by physical constraints with the presence of the San Diego River floodway which passes through the site in an east to west direction and by steep terrain on the north and south.

There are existing rural residences to the north and south of the project site. These sensitive land uses may be potentially affected by the noise generated during operation of the project.

1.2.3 Overview of the Existing Noise Environment

El Monte Valley has background noise typical of rural/semi-developed areas. The primary existing noise source in the project area is traffic noise from five roads: El Monte Road, Willow Road, Ashwood Street, Lake Jennings Park Road, and State Route 67 (SR-67) in the distance. Willow Road is a dirt road for several miles with minimal traffic. The other four roads are paved and have much higher traffic volumes. Both commercial and private airplanes and helicopters fly over at high altitudes. The farms in the area have livestock, horses, and dogs, all of which contribute to the background noise level. The sounds of insects and wind are also prevalent.

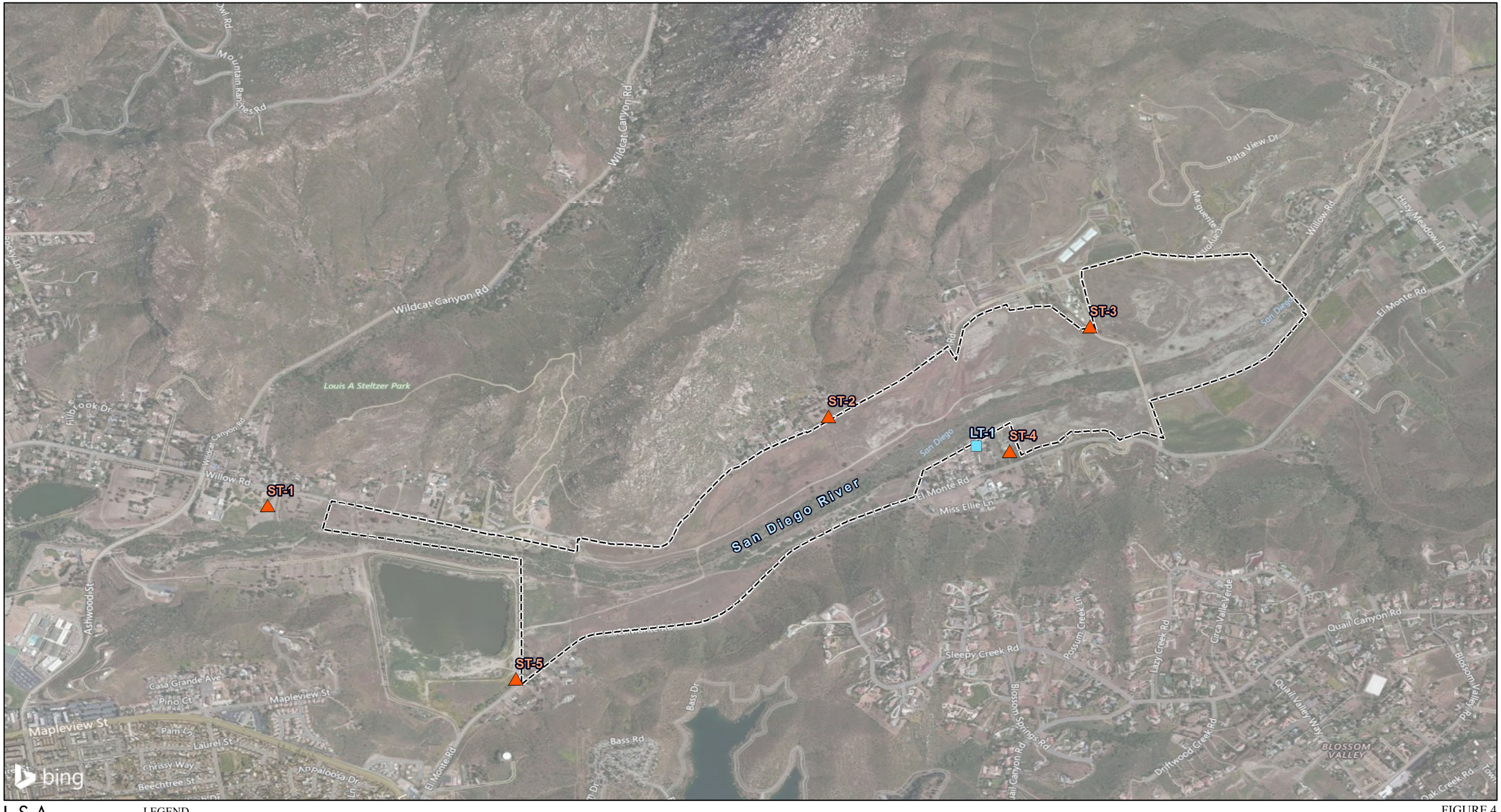
1.2.3.1 Ambient Noise Measurements

LSA Associates, Inc. (LSA) conducted one long-term and five short-term noise level measurements at sensitive receiver locations throughout El Monte Valley near the community of Lakeside in San Diego County, California, on March 2 and 3, 2011, and June 11, 2015. All of the measurements were conducted using a Larson Davis 831 –

Type 1 – 1/3rd-Octave Integrating SLM (Serial No. 2441), and a Larson Davis 820 – Type 1 – Integrating SLM (Serial No. 1584). The measurements were performed in accordance with the sound level measurement procedures and criteria in the County's Noise Abatement and Control Ordinance, *Section 36.410, Sound Level Limitations on Impulsive Noise.* The SLMs were field calibrated prior to their measurement of noise levels, the measurements were made with A-weighting and slow response, and the SLMs were placed 5 feet above the ground. All measurements were made as an equivalent continuous level, which performs integration (energy average) of the sound levels over a given period of time. The measurements were made in 1-hour periods (L_{eq} [1 hr]). The previously completed long-term measurement was used to calculate daily noise levels for the new noise measurement locations.

Table F summarizes the location, time of day, and the noise level of the short- and long-term measurements. Appendix A shows the graph of the 24-hour noise monitoring at location LT-1 as well as the other noise measurement data. Figure 4 denotes the location of each short- and long-term measurement.

- **LT-1:** The noise meter was placed just outside of the stable area near the property line on the northwestern corner of the farm. The farm owner trains animals in this stable and spends the majority of the daytime hours near this area. This measurement represents the closest sensitive outdoor frequent use zone on the southern side of the El Monte Valley project site.
- **ST-1:** The noise level measurement was located on the southeast corner of the site near the baseball diamonds at Matt LaChappa Field. The noise sources during the measurement include traffic on nearby roadways, animals in the area, and a distant remote-controlled airplane.
- **ST-2:** The noise level measurement was located near the single-family home and farm uses north of the project site across from The Magic Horse. The noise sources during the measurement include birds chirping, animals in the area, and distant traffic. Willow Road at this location is not paved.
- **ST-3:** The noise level measurement was located just south of the Happy Holstein, an activity center for children. The noise sources during the measurement include birds chirping, animals in the area, and distant traffic.
- **ST-4:** The noise level measurement was located east of the single-family homes south of the project site in-line with the residential structures. The noise sources during the measurement include traffic on El Monte Road, birds chirping, and tools in the area.
- **ST-5:** The noise level measurement was located near the entrance of the Helix Property on the north side of El Monte Road. The noise sources during the measurement include traffic on El Monte Road, birds chirping, and planes in the distance.



LSA

LEGEND

- Project Boundary
- Long Term
- Short Term

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FEET

SOURCE: Bing (2014); ESA (2016)

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FIGURE 4

El Monte Sand Mining Project

Noise Monitoring Locations

Table F: Noise Level Measurement Results

ID	Location	Time	L_{eq} (1 hr) dBA	CNEL dBA
LT-1	14660 El Monte Road, just outside stable area on northeastern corner. Southern side of El Monte Valley.	March 2–3, 2011	33.0–50.0	50.0
ST-1	13117 Willow Road, located near the baseball diamonds at Matt LaChappa Field.	June 11, 2015 9:43 a.m.	42.7	42.7
ST-2	14512 Willow Road, located near the single-family homes/ farms.	June 11, 2015 10:24 a.m.	41.0	43.0
ST-3	15016 Willow Road, located south of Happy Holstein.	June 11, 2015 10:55 a.m.	39.9	41.9
ST-4	14732 El Monte Road, located near the single-family homes rear-property line.	June 11, 2015 11:35 a.m.	42.6	44.6
ST-5	13969 El Monte Road, located near the existing project site entrance across from single-family homes.	June 11, 2015 11:58 a.m.	57.1	59.1

Source: LSA Associates, Inc. (March 2011; June 2015).
CNEL = Community Noise Equivalent Level over a 24-hour period
dBA = A-weighted decibels
L_{eq} (1 hr) = equivalent continuous level over a period of 1 hour

2.0 THRESHOLDS OF SIGNIFICANCE

A project will normally have a significant noise-related effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of the community in which it is located. The applicable noise standards governing the project site are the criteria in the County's Noise Element and Noise Control Ordinance.

2.1 COUNTY OF SAN DIEGO NOISE GUIDELINES

The County of San Diego has adopted a Noise Element of the General Plan (adopted February 20, 1975, latest Amendment August 2011).

The following is taken from the County's Noise Element, Goal N-5 and Policies N-5.1 and N-5.2:

GOAL N-5: Non-Transportation-Related Noise Sources. A noise environment that provides minimal noise spillovers from industrial, commercial, agricultural, extractive, and similar facilities to adjacent residential neighborhoods.

Policy N-5.1 Truck Access. Design development so that automobile and truck access to industrial and commercial properties abutting residential properties is located at the maximum practical distance from residential zones.

Policy N-5.2 Noise-Generating Industrial Facilities. Locate noise-generating industrial facilities at the maximum practical distance from residential zones. Use setbacks between noise-generating equipment and noise-sensitive uses and limit the

operation of noise-generating activities to daytime hours as appropriate where such activities may affect residential uses.

A noise-sensitive land use is any residence, hospital, school, hotel, resort, library, or similar facility where quiet is an important attribute of the environment.

In the San Diego County Code of Regulatory Ordinance, Chapter 4 Noise Abatement and Control, Section 36.404 General Sound Level Limits, the County specifies maximum noise levels for the 1-hour average sound level at any point on or beyond the boundaries of the property on which the sound is produced, as shown in Table G.

Table G: Noise Abatement and Control for Determining Zonal Property Line Sound Level Limits

Zone	Time	Applicable Limit 1-Hour Average Sound Level (dB)
RS, RD, RR, RMH, A70, A72, S80, S81, S87, S88, S90, S92, RV, and RU. Use regulations with a density of less than 11 DU/ac.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
RRO, RC, RM, C30, S86, RV, RU, and V5. Use regulations with a density of 11 or more DU/ac.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
S94, V4, and all other commercial zones	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
V1, V2 V1, V2 V1 V2 V3	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m. 10 p.m. to 7 a.m. 7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 55 50 70 65
M50, M52, M54	Anytime	70
S82, M58, and all other industrial zones	Anytime	75

Source: San Diego County Code Regulatory Ordinance.
dB = decibels
DU/ac = dwelling units per acre

Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of an Master Use Permit (MUP) that authorizes the noise-generating use or activity, and the decision-making body approving the MUP determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with the noise ordinance requirements.

If the measured ambient level exceeds the applicable limit noted above, the allowable 1-hour average sound level shall be the ambient noise level. The ambient noise level shall be measured when the alleged noise violation source is not operating.

The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts provided the 1-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 dB at the property line, regardless of the zone where the extractive industry is actually located.

The 1-hour average property line sound level limit is 45 dBA for all property lines during nighttime hours between 10 p.m. and 7 a.m.

The County's Noise Abatement and Control ordinance, Section 36.409, Sound Level Limitations on Construction Equipment, states that "Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceed an average sound level of 75 decibels for an 8-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received."

In the County's Noise Abatement and Control ordinance, Section 36.410, Sound Level Limitations on Impulsive Noise, it states:

> "In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound limitations shall apply:
>
> (a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410 [see Table H], when measured at the boundary line of the property line where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A [see Table H] are as described in the County Zoning Ordinance.
>
> (b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3.6.410B [see Table I], when measured at the boundary line of the property line where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A [see Table I] are as described in the County Zoning Ordinance.

Table H: Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

Source: San Diego County Code, Table 36.410A, Section 36.410.
dBA = A-weighted decibels

Table I: Maximum Sound Level (Impulsive) Measured at Occupied Property in Decibels for Public Road Projects

Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

Source: San Diego County Code, Table 36.410B, Section 36.410.
dBA = A-weighted decibels

(c) The minimum measurement period for any measurements concluded under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the maximum sound level for any portion of any minute it will be deemed that the maximum sound level was exceeded during that minute."

2.2 VIBRATION THRESHOLDS

Based on the *Transit Noise and Vibration Impact Assessment* (FTA 2006) and depending on the building category of the nearest buildings to the project area, the potential vibration damage criteria vary. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 102 VdB (an equivalent to 0.5 in/sec in RMS) (FTA 2006) is considered safe and would not result in any vibration damage. For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in RMS). The RMS values for building damage thresholds referenced above are shown in Table J and were taken from *Transportation- and Construction-Induced Vibration Guidance Manual* (prepared by Jones & Stokes, June 2004 for the California Department of Transportation).

Table J: Guideline Vibration Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources[1]	Continuous/Frequent Intermittent Sources[2]
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Source: California Department of Transportation, Transportation- and Construction-Induced Vibration Guidance Manual (June 2004).

[1] Transient sources create a single, isolated vibration event, such as blasting or drop balls.

[2] Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

in/sec = inches per second
PPV = peak particle velocity

3.0 PROJECT IMPACTS

The project operations will be performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases and the individual activities associated with each phase would change the character of the noise generated on the site. Therefore, the noise levels vary as operations progress through the various phases and activities. Despite the variety in the type and size of equipment, similarities in the dominant noise sources and patterns of operation allow operation-related noise levels to be categorized by individual activities within each work phase. Table K shows the composite noise level (based on the equipment and activities provided by the project description) produced by each different activity with all of the heavy machinery operating simultaneously. These calculations take into account the number of pieces of equipment, usage factor or duty cycle assumed for each piece of equipment, and ground effect at a reference distance of 50 feet. Appendix B contains the construction and operational noise level calculation sheets.

Table K: Composite Noise Levels

Activity	L_{eq} at 50 ft dBA[1]	Distance to 75 dBA L_{eq} Contour (ft)
Site Preparation[2]	84	120
Mining Operation – Excavation and Reclamation	87	150
Mining Operation – Processing Plant Operations	89	170

Source: LSA Associates, Inc. (January 2018).

[1] As shown in Appendix B, the hourly noise levels calculated take into account the usage factor or duty cycle of each piece of equipment.

[2] Noise levels associated with construction-related site preparation activities are based on an 8-hour L_{eq} criterion. For the purposes of this analysis, the projected composite noise levels are the same for a 1-hour L_{eq} and an 8-hour L_{eq}.

dBA = A-weighted decibels ft = feet L_{eq} = equivalent continuous sound level

3.1 TEMPORARY CONSTRUCTION SITE PREPARATION NOISE IMPACTS

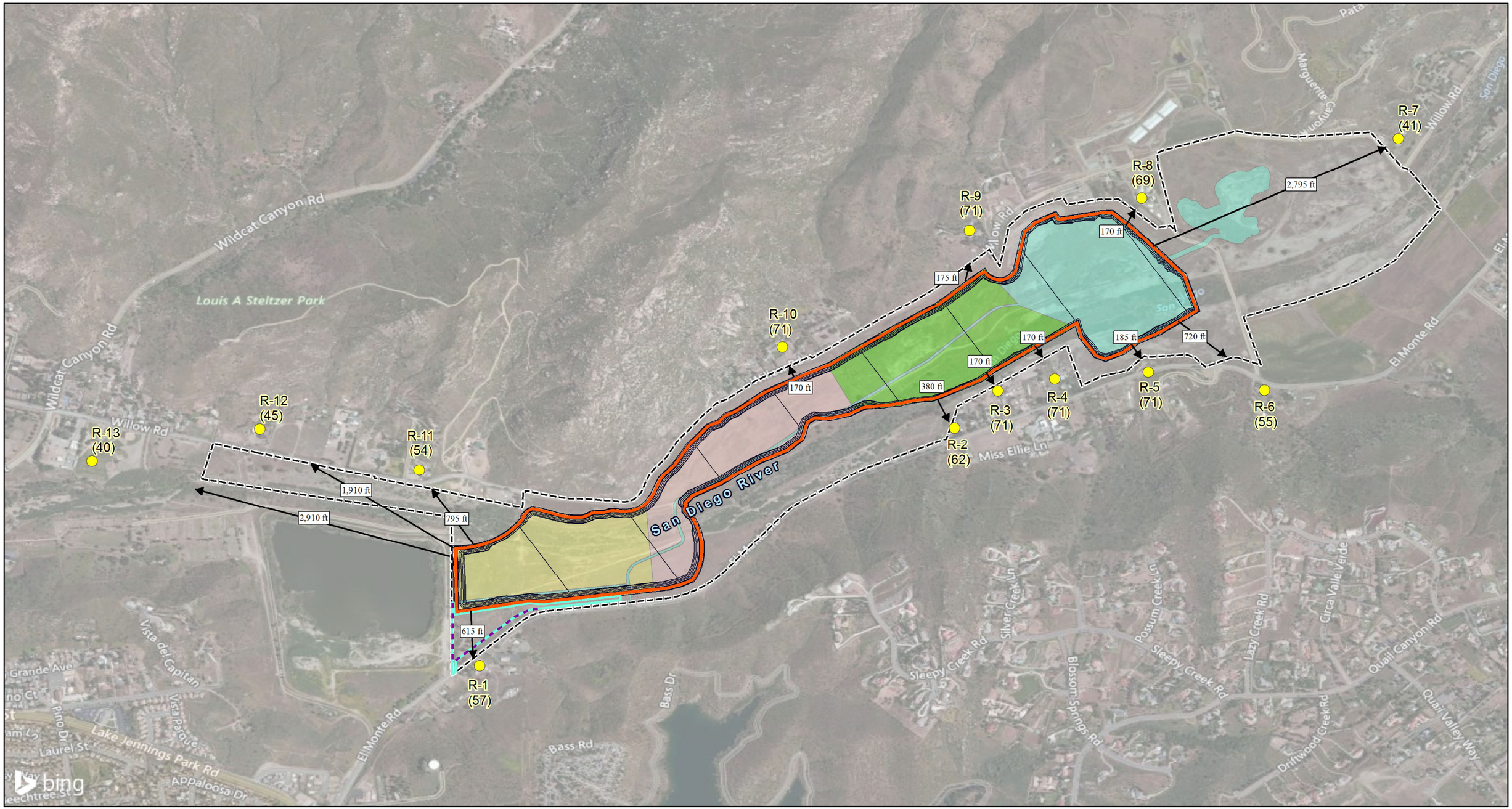
Noise impacts associated with the short-term construction-related noise impacts must comply with the standards presented in Section 36.409 of the County of San Diego Municipal Code, which were described in detail in Section 2.1. There will be no impulsive operations such as blasting or pile driving as part of this project; therefore, information on the impulsive noise standards will be provided for reference purposes only. For the purposes of this analysis, it is assumed that construction activities will potentially occur for longer than 8 hours at a time and that construction-related noise impacts will be the same for each hour within any given 8-hour period to provide a conservative analysis. Table L shows the receivers that would be potentially affected by the site preparation construction activities, the distances from the activities to the property lines, and the estimated noise level at each receptor. As shown in previously referenced Table K, site preparation construction activities cause a noise impact of 75 dBA 8-hour L_{eq} at 120 feet. The noise level at each receptor is rounded to the nearest decibel and assumes no shielding by intervening terrain. Appendix B presents the list of equipment that would be used during site preparation and references noise calculations.

Receptors R-3, R-4, R-8, and R-10 show that the shortest distance from the edge of mining activities to the nearest property line is 170 feet; therefore, the project construction-related activities will not result in a significant noise impact. If construction related activities are located within 120 feet of the project boundary, a potentially significant impact could occur, therefore, the project contractor on site shall require all activities associated with site preparation occur a minimum of 120 feet from the project boundaries. Figure 5 shows the locations of the receivers and distances from the construction activities to the property line.

Table L: Site Preparation Construction Activities

Receiver	Distance to Property Line (ft)	Noise Level at Receptor (dBA 8-hour L_{eq})
R-1	615	57
R-2	380	62
R-3	170	71
R-4	170	71
R-5	185	71
R-6	720	55
R-7	2,795	41
R-8	170	69
R-9	175	71
R-10	170	71
R-11	795	54
R-12	1,910	45
R-13	2,910	40

Source: LSA Associates, Inc. (January 2018).



LSA

LEGEND

- Project Boundary
- Contour Line Features
- Modeled Noise Receivers (Predicted Noise Level in dBA Leq)
- 20-foot Wide Benchline
- 8' High Berm
- Processing Area (Part of Phase 1)

Site Plan Phasing

- Phase 1
- Phase 2
- Phase 3
- Phase 4

N

0 600 1200
FEET

SOURCE: Bing (2014); ESA (2016)

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FIGURE 5

El Monte Sand Mining Project

Construction-Related Site Preparation Project Impacts

Typically noise impacts associated with construction only affect a localized area and there are currently no other planned projects in the study area that will be constructing at the same time as the proposed project, there are no cumulative impacts associated with noise impacts during the construction phase.

3.2 PROJECT OPERATION-RELATED NOISE IMPACTS

Noise impacts associated with the long-term operation-related noise impacts must comply with the standards presented in Section 36.404 of the County of San Diego Municipal Code, which were described in detail in Section 2.1.

3.2.1 Excavation and Reclamation Operational Noise Impacts

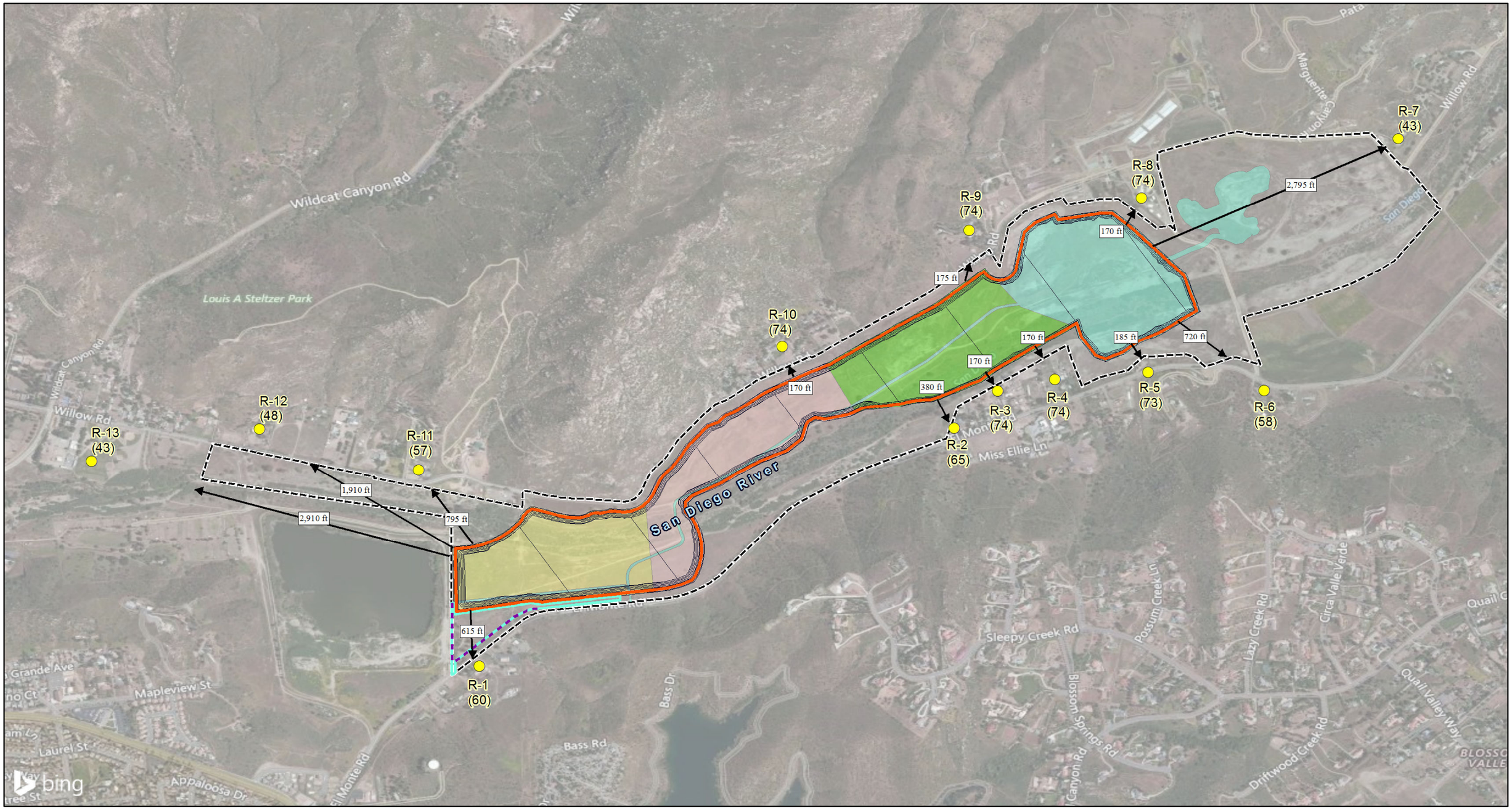
Table M shows the receivers that would be potentially affected by the mining excavation operations and reclamation activities, the distances from the operational activities to the property lines, and the estimated noise level at each receptor. As shown in previously referenced Table K, mining operations cause a noise impact of 75 dBA L_{eq} at 150 feet. The noise level at each receptor is rounded to the nearest decibel and assumes no shielding due to intervening terrain. Appendix B presents the list of equipment that would be used during excavation and reclamation operations and references noise calculations.

Table M: Extraction and Reclamation Activities

Receiver	Distance to Property Line (ft)	Noise Level at Receptor (dBA)
R-1	615	60
R-2	380	65
R-3	170	74
R-4	170	74
R-5	185	73
R-6	720	58
R-7	2,795	43
R-8	170	74
R-9	175	74
R-10	170	74
R-11	795	57
R-12	1,910	48
R-13	2,910	43

Source: LSA Associates, Inc. (January 2018).

Figure 6 shows the location of the receivers and distance from project activities to the property line. Receptors R-3, R-4, R-8, and R-10 show that the shortest distance from the edge of mining activities to the nearest property line is 170 feet; therefore, the project activities will not result in a significant noise impact. If excavation and reclamation activities are located within 150 feet of the project boundaries, a potentially significant impact may occur, therefore, the project contractor on site shall require all



LSA

LEGEND

- Project Boundary
- Contour Line Features
- Modeled Noise Receivers (Predicted Noise Level in dBA Leq)
- 20-foot Wide Benchline
- 8' High Berm
- Processing Area (Part of Phase 1)

Site Plan Phasing

- Phase 1
- Phase 2
- Phase 3
- Phase 4

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FEET

SOURCE: Bing (2014); ESA (2016)

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FIGURE 6

El Monte Sand Mining Project

Extraction and Reclamation Project Impacts

activities associated with extraction and reclamation occur a minimum of 150 feet from the project boundaries.

3.2.2 Processing Plant Operations Noise Impacts

A total of two processing plants will be used for the project. One mobile processing plant will move as the project proceeds from phase to phase along the defined path in Figure 7. In order to remain conservative, it is assumed that all pieces of equipment that make up the processing plant are operating simultaneously at the locations identified. Figure 7 shows the location of each processing plant location. Table N shows the receivers that would be potentially affected by processing plant operations and the estimated noise level at each receptor. As shown in previously referenced Table K, mining operations cause a noise impact of 75 dBA L_{eq} at 170 feet. The noise level at each receptor is rounded to the nearest decibel and assumes no shielding by intervening terrain. Appendix B presents the list of equipment that would be used during processing plant operations and references noise calculations.

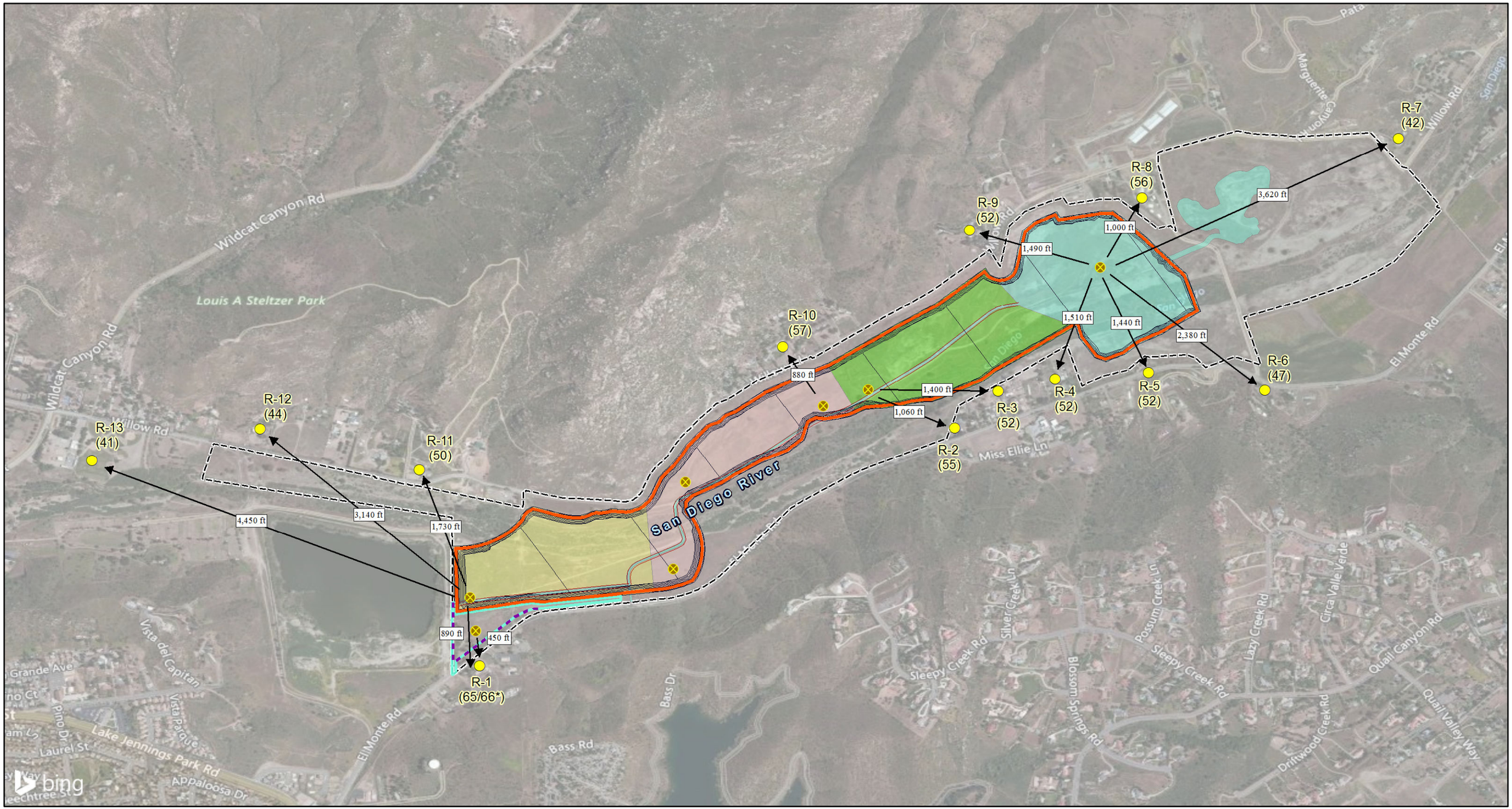
Table N: Aggregate Plant Operations Activities

Receiver	Distance to Receptor (ft)	Noise Level at Receptor (dBA)
R-1	890	61
R-2	1,060	55
R-3	1,400	52
R-4	1,510	52
R-5	1,440	52
R-6	2,380	47
R-7	3,620	42
R-8	1,000	56
R-9	1,490	52
R-10	880	57
R-11	1,730	50
R-12	3,140	44
R-13	4,450	41

Source: LSA Associates, Inc. (January 2018).

Figure 7 shows the location of the receivers and distance from project activities to the property line. Receptor R-1 shows that the shortest distance from the path of portable mining activities to the nearest property line is 890 feet; therefore, the project activities will not result in a significant noise impact.

In addition to the mobile processing plant, a stationary plant made up of similar equipment will be staged at the southwestern corner for the duration of the project. This plant will be located approximately 450 feet from the nearest receiver and is expected to cause a noise impact of 65 dBA L_{eq}. The greatest noise impact experienced at any of the receptors would occur when the mobile plant is closest to the permanent plant



LSA

LEGEND

- Project Boundary
- Contour Line Features
- Haul Route
- Modeled Noise Receivers (Predicted Noise Level in dBA Leq)
- 20-foot Wide Benchline
- 8' High Berm
- Processing Area (Part of Phase 1)
- Processing Plant Locations

Site Plan Phasing

- Phase 1
- Phase 2
- Phase 3
- Phase 4

0 600 1200
FEET

* The worst-case composite level of 66 dBA at R-1 is made up of the stationary processing plant (65 dBA) plus the mobile stationary plant (61 dBA) when the mobile plant is closest to R-1

SOURCE: Bing (2014); ESA (2016)

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FIGURE 7

El Monte Sand Mining Project

Processing Plant Project Impacts

nearest receiver R-1. During this time the combined noise levels of the two plants would approach 66 dBA L_{eq}; therefore, the project activities will not result in a significant noise impact.

If processing plant operation activities are located within 170 feet of the project boundaries, a potentially significant impact may occur, therefore, the project contractor shall require all activities associated with the processing plant occur a minimum of 170 feet from the project boundaries.

Additionally, the project proposes an 8-foot berm as a project feature located along the property line near the permanent processing plant. It is expected that the berm will provide a reduction of approximately 6 dBA which will further reduce noise levels experienced at Receptor R-1. This also allows, if necessary, the processing plant to work as close as 100 feet from the berm without causing a noise impact.

Typically, noise impacts associated with operations at an existing site are localized. There are currently no other planned projects in the study area that will be operating in close proximity and simultaneously with the proposed project, thus producing no noise impacts to the receptors analyzed within this analysis, resulting in no cumulative impacts associated with noise operations of the proposed project.

3.3 PROJECT TRAFFIC-RELATED NOISE IMPACTS

The FHWA model is an empirical model that predicts highway noise levels by making a series of adjustments to a base reference sound level: the energy mean emission level. This energy mean emission level is calculated and then adjusted to account for traffic flows, varying distances from the roadway, finite length roadways, and for shielding. The FHWA model uses three vehicle types to quantify traffic flows: autos, medium trucks, and heavy trucks. Autos are defined as vehicles with two axles and four wheels. Medium trucks are vehicles with two axles and more than 4 wheels and heavy trucks are identified as having more than two axles.

The projected mining operations traffic would include a maximum of 342 vehicle trips per day for employee vehicles and trucks based on the El Monte Sand Mining and Reclamation Project Traffic Impact Study (Linscott, Law and Greenspan, May 2016). The 342 trips per day is comprised of 314 heavy truck trips and 28 light vehicle trips. These trips equate to an ADT of 813, which is determined by multiplying the number of heavy truck trips by 2.5, the passenger car equivalent (PCE) factor, and then adding to the trips of the light vehicles. These traffic volumes are relatively small when compared to the existing plus cumulative traffic volumes on Lake Jennings Park Road (12,010 ADT for the El monte to Ashwood segment; 15,610 ADT for the Blossom to El Monte Road segment) and El Monte Road (2,510 ADT).

As described above, the FHWA model has a number of factors that it accounts for in predicting traffic noise levels, one of them specifically being truck mix. In order to calculate the potential impact from the proposed project traffic, the volume of 813 was

added to the existing plus cumulative volume and the truck mix was adjusted accordingly to account for the increased percentage in heavy trucks.

The increase in automobile and truck traffic due to the project would cause the existing noise levels to increase by less than the 3 dBA threshold normally perceptible by the human ear, which would typically be caused by a doubling in traffic. Therefore, short-term, worker commutes and equipment transport noise impacts would not be substantial. No mitigation measures would be required for off-site traffic noise abatement. Appendix C shows the FHWA Traffic Noise Model Printouts.

Table O lists the existing traffic CNEL noise levels along Lake Jennings Park Road and El Monte Road. At a distance of 50 feet from the roadway centerline, all of the roadway segments that were analyzed currently exceed the County's 60 dBA CNEL residential property line noise limit.

Table P lists the existing traffic plus cumulative future traffic (due to increased development) CNEL noise levels along Lake Jennings Park Road and El Monte Road. The cumulative traffic will cause the existing CNEL to increase by 0.6 dBA along Lake Jennings Park Road–Blossom to El Monte, 0.6 dBA along Lake Jennings Park Road–El Monte to Ashwood, and 0.0 dBA along El Monte Road.

Table Q lists the existing plus cumulative plus project traffic CNEL noise levels along Lake Jennings Park Road and El Monte Road. The existing traffic plus cumulative traffic plus project traffic will cause the existing CNEL to increase by 0.2 dBA along Lake Jennings Park Road–Blossom to El Monte, 0.2 dBA along Lake Jennings Park Road–El Monte to Ashwood, and 2.4 dBA along El Monte Road.

Table O: Existing Traffic (2011) Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Lake Jennings Park Road–Blossom to El Monte	13,060	< 50	90	192	67.5
Lake Jennings Park Road–El Monte to Ashwood	10,540	< 50	79	167	66.0
El Monte Road	2,500	< 50	< 50	64	60.9

Source: LSA Associates, Inc. (January 2018).
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet

Table P: Existing Traffic Plus Cumulative Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase from Existing Conditions CNEL (dBA)
Lake Jennings Park Road–Blossom to El Monte	15,190	< 50	99	212	68.1	0.6
Lake Jennings Park Road–El Monte to Ashwood	12,010	< 50	86	182	66.6	0.6
El Monte Road	2,510	< 50	< 50	64	60.9	0.0

Source: LSA Associates, Inc. (January 2018).
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet

Table Q: Existing Plus Cumulative Plus Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase from Existing Plus Cumulative Conditions CNEL (dBA)
Lake Jennings Park Road–Blossom to El Monte	15,610	< 50	101	216	68.3	0.2
Lake Jennings Park Road–El Monte to Ashwood	12,430	< 50	88	186	66.8	0.2
El Monte Road	3,330	< 50	< 50	92	63.3	2.4

Source: LSA Associates, Inc. (January 2018).
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = foot/feet

In addition to the potential daily traffic noise impact, the project also will cause short-term hourly noise level impacts when haul trucks access the site. Based on the traffic study information, it is expected that up to 30 loads per hour may occur along El Monte Road. The existing peak hour traffic volumes on the segment of road between Lake Jennings Park Road and the project site has a peak hour volume of approximately 200 vehicles. With an additional 30 trips within the peak hour, a noise level increase of less than 3 dBA is expected and, therefore, would not cause a signification impact.

3.4 PROJECT CONSTRUCTION AND OPERATIONS VIBRATION IMPACTS

The project site lies within the Foothills Physiographic Province of San Diego County. This is a transitional area between the mountainous areas to the east and the coastal plain. The project site is primarily underlain by unconsolidated saturated sands. During both the construction-related site preparation and mining operation phases of the project, similar heavy equipment will be used on site.

Bulldozers and other heavy-tracked equipment generate approximately 87 VdB of groundborne vibration when measured at 25 feet, based on *Transit Noise and Vibration Impact Assessment* (FTA 2006). This level of groundborne vibration exceeds the threshold of human perception, which is around 65 VdB. Based on the Caltrans *Transportation-Related Earthborne Vibration, Technical Advisory* (1992), the vibration level at 50 feet is approximately 9 VdB lower than the vibration level at 25 feet. Vibration at 100 feet from the source is more than 9 VdB lower than the vibration level at 50 feet, or more than 18 VdB lower than the vibration level at 25 feet. Every doubling of distance from 25 feet results in the reduction of the vibration level by 9 VdB; therefore, receptors at 50 and 100 feet from the operational activity may be exposed to groundborne vibration up to 78 and 69 VdB, respectively. Because the soil type is mostly loose sands, the vibration level will diminish more rapidly, which will potentially result in vibration levels lower than the calculated levels above. Although this range of

groundborne vibration levels would result in potential annoyance at residences adjacent to the project site, it would not cause any damage to the structures. Ground vibrations from normal heavy equipment activities do not often reach the levels that can damage structures, but they can achieve the audible and sensate ranges in structures very close to the project site. Problems with groundborne vibration from heavy equipment sources are usually localized to areas within approximately 100 feet from the vibration source. Table R lists the potential vibration levels from various heavy equipment sources.

The existing structures in the project vicinity, including residential buildings to the north, east and south, are located at least 200 feet from the proposed mining and reclamation areas that would be exposed to groundborne vibration below 60 VdB. Therefore, operations on the project site would potentially result in the exposure of persons to groundborne vibration or groundborne noise levels below 65 VdB.

Table R: Vibration Source Amplitudes for Heavy Duty Equipment

Equipment	Reference PPV at 25 ft (in/sec)	Approximate VdB at 25 ft
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Small Bulldozer	0.003	58

Sources: Federal Transit Administration, 2006
ft = feet
in/sec = inches per second
PPV = peak particle velocity

Operations of the proposed project would not involve any vibration sources that would cause exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. Therefore, the vibration-related impacts will be less than significant.

Because the rubber tires and suspension systems of buses and other on-road vehicles provide vibration isolation, it is unusual for on-road vehicles to cause groundborne noise or vibration problems. When on-road vehicles cause effects such as rattling of windows, the source is almost always airborne noise. Most problems with on-road, vehicle-related vibration can be directly related to a pothole, bump, expansion joint, or other discontinuity in the road surface. Smoothing the bump or filling the pothole will usually solve the problem.

Vehicles with rubber tires would not generate any significant groundborne vibration. No significant groundborne vibration impacts would occur. No mitigation is required.

Typically, impacts associated with vibration are very localized. There are currently no other planned projects in the study area that will be constructing or operating at the

same time as the proposed project, therefore there are no cumulative impacts associated with vibrations impacts for the proposed project.

4.0 MITIGATION MEASURES

4.1 PROJECT CONSTRUCTION AND OPERATIONS IMPACTS

The following measures should be implemented to reduce potential short-term construction and long-term operational noise impacts on nearby sensitive receptors and ensure that potentially significant impacts do not occur:

- All operations will be limited to the hours of 7:00 a.m. to 5:00 p.m. on any working day except Sundays and holidays, in accordance with the Major Use Permit (MUP) for the proposed project, and is consistent with the San Diego County Code of Regulatory Ordinance, Chapter 4 Noise Abatement and Control, Section 36.404 General Sound Level Limits, daytime hours. Operational noise levels shall not exceed an equivalent continuous sound level of 75 dBA (dBA) equivalent continuous sound level (L_{eq}) for any hour at the project boundary. No activities are permitted outside of these hours or on Sundays and holidays. No queuing of trucks at the project entrance prior to 7:00 a.m. is allowed.
- During all project-related activities, the project contractors shall equip all equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- The project contractor shall place all stationary equipment so that emitted noise is directed away from sensitive receptors nearest the project site where feasible.
- The contractors shall locate equipment staging in areas that will create the greatest distance between operations-related noise sources and the noise-sensitive receptors nearest the project site during all project operations.
- During the site preparation and construction phase, the project contractor on site shall require all activities to occur a minimum of 120 feet from the project boundaries.
- During the excavation and reclamation operational phases, the project contractor on site shall require all activities occur a minimum of 150 feet from the project boundaries.
- During the processing plant operational phases, the project contractor on site shall require all activities occur a minimum of 170 feet from the project boundaries except when processing plant operations occur in the southwest corner of the project site, equipment must remain a distance of 100 feet or more from the 8-foot high berm, which is a project feature.

4.2 TRAFFIC NOISE IMPACTS

No mitigation measures are required for traffic noise because the traffic noise impacts will not be substantial.

4.3 VIBRATION-RELATED IMPACTS

No mitigation measures are required for vibration impacts because the vibration impacts will not be substantial.

5.0 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the identified mitigation measures will reduce potential short-term and long-term noise impacts and ensure that noise levels remain to below a level of significance.

6.0 REFERENCES

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Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, May 2006. Website: http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf. Date Accessed: January 5, 2018.

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APPENDIX A

FIELD MEASUREMENT DATA SHEETS

Noise Measurement Survey

Project Number: ESS1501 Test Personnel: JT Stephens
Project Name: El Monte Mining Equipment: Larson Davis 831

Site Number: ST-1 Date: 6/11/2015 Time: From 9:43 am To 9:56 am

Site Location: Matt La Chappa Field, near baseball field.

Noise Sources: Animals, vehicles in distance, remote controlled airplane.

Measurement Results:

	dBA
L_{eq}	42.7
L_{max}	58.8
L_{min}	37.4
L_2	47.0
L_8	44.6
L_{25}	43.1
L_{50}	41.8
L_{90}	39.5

Atmospheric Conditions:

Maximum Wind Velocity (mph)	4.5
Average Wind Velocity (mph)	1.6
Temperature (F)	69.0
Relative Humidity (%)	78.2
Comments:	

Comments: Generally Quiet. File stored 75.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT

Location Photo:

Noise Measurement Survey

Project Number: ESS1501 Test Personnel: JT Stephens
Project Name: El Monte Mining Equipment: Larson Davis 831

Site Number: ST-2 Date: 6/11/2015 Time: From 10:24 am To 10:39 am

Site Location: 14512 Willow Road across from The Magic Horse.

Noise Sources: Birds, horses, distant traffic.

Measurement Results:

	dBA
L_{eq}	41.0
L_{max}	57.8
L_{min}	29.9
L_2	46.7
L_8	44.2
L_{25}	41.7
L_{50}	38.8
L_{90}	33.6

Atmospheric Conditions:

Maximum Wind Velocity (mph)	2.0
Average Wind Velocity (mph)	0.9
Temperature (F)	73.0
Relative Humidity (%)	68.2
Comments:	

Comments: Unpaved road, no through traffic. File stored 76.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT

Location Photo:

Noise Measurement Survey

Project Number: ESS1501 Test Personnel: JT Stephens
Project Name: El Monte Mining Equipment: Larson Davis 831

Site Number: ST-3 Date: 6/11/2015 Time: From 10:55 am To 11:10 am

Site Location: South of 15016 Willow Road. South of Heppy Holstein.

Noise Sources: Birds chirping, other animals, airplanes and traffic in distance.

Measurement Results:

	dBA
L_{eq}	39.9
L_{max}	54.9
L_{min}	31.2
L_2	49.0
L_8	43.2
L_{25}	39.3
L_{50}	36.6
L_{90}	33.4

Atmospheric Conditions:

Maximum Wind Velocity (mph)	3.8
Average Wind Velocity (mph)	1.2
Temperature (F)	77.9
Relative Humidity (%)	59.9
Comments:	

Comments: Very quiet without planes, however, planes can be rather loud. File stored 77.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT

Location Photo:

Noise Measurement Survey

Project Number: ESS1501 Test Personnel: JT Stephens
Project Name: El Monte Mining Equipment: Larson Davis 831

Site Number: ST-4 Date: 6/11/2015 Time: From 11:35 am To 11:50 am

Site Location: 14732 El Monte Road, near the rear property line.

Noise Sources: Traffic on El Monte Road, birds chirping, distant tools.

Measurement Results:

	dBA
L_{eq}	42.6
L_{max}	59.4
L_{min}	32.2
L_2	49.3
L_8	46.5
L_{25}	42.9
L_{50}	39.9
L_{90}	36.1

Atmospheric Conditions:

Maximum Wind Velocity (mph)	4.0
Average Wind Velocity (mph)	1.4
Temperature (F)	77.4
Relative Humidity (%)	60.8
Comments:	

Comments: East end of single family homes, adjacent to site. File Saved as 78.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT

Location Photo:

Noise Measurement Survey

Project Number: ESS1501 Test Personnel: JT Stephens
Project Name: El Monte Mining Equipment: Larson Davis 831

Site Number: ST-5 Date: 6/11/2015 Time: From 11:58 am To 12:13 am

Site Location: Across from 13969 El Monte Drive. Current property gated entrance.

Noise Sources: Traffic on El Monte Road, planes in distance, birds, tools at home.

Measurement Results:

	dBA
L_{eq}	57.1
L_{max}	74.8
L_{min}	32.3
L_2	67.5
L_8	62.3
L_{25}	51.5
L_{50}	43.6
L_{90}	36.4

Atmospheric Conditions:

Maximum Wind Velocity (mph)	6.9
Average Wind Velocity (mph)	1.5
Temperature (F)	76.8
Relative Humidity (%)	61.6
Comments:	

Comments: Homes on opposite side of El Monte Road. File Saved as 79.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT

Location Photo:

APPENDIX B

CONSTRUCTION AND OPERATION CALCULATIONS

Site Preparation Activities

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Leq	Energy
1	Loader (980)	78	1	40	50	0.5	0	78.0	74.0	25238293.8
2	Water Truck	75	1	40	50	0.5	0	75.0	71.0	12649110.6
3	Grader	85	1	40	50	0.5	0	85.0	81.0	126491106
4	Haul Truck	84	1	40	50	0.5	0	84.0	80.0	100475457
5	Pick-Up Truck	75	1	40	50	0.5	0	75.0	71.0	12649110.6
							Lmax*	**88**	**Leq**	**84**
									Law	**116**

Source: LSA, August 2016.

1- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA
50	15.2	0.5	84
60	18.3	0.5	82
70	21.3	0.5	81
80	24.4	0.5	79
90	27.4	0.5	78
100	30.5	0.5	77
110	33.5	0.5	76
120	36.6	0.5	75
130	39.6	0.5	74
140	42.7	0.5	73
150	45.7	0.5	73
160	48.8	0.5	72
170	51.8	0.5	71
180	54.9	0.5	71
190	57.9	0.5	70
200	61.0	0.5	69
210	64.0	0.5	69
220	67.1	0.5	68
230	70.1	0.5	68
240	73.1	0.5	67
250	76.2	0.5	67
260	79.2	0.5	67
270	82.3	0.5	66
280	85.3	0.5	66
290	88.4	0.5	65
300	91.4	0.5	65
310	94.5	0.5	65
320	97.5	0.5	64
330	100.6	0.5	64
340	103.6	0.5	64
350	106.7	0.5	63
360	109.7	0.5	63
370	112.8	0.5	63

Mining Operations - Excavation and Reclamation

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Leq	Energy
1	Loader (988)	80	1	40	50	0.5	0	80.0	76.0	40000000
2	Loader (980)	78	2	40	50	0.5	0	81.0	77.0	50476587.6
3	Dozer	82	1	40	50	0.5	0	82.0	78.0	63395727.7
4	Water Truck	75	1	40	50	0.5	0	75.0	71.0	12649110.6
5	Grader	85	1	40	50	0.5	0	85.0	81.0	126491106
6	Haul Truck	84	1	40	50	0.5	0	84.0	80.0	100475457
7	Excavator	85	1	40	50	0.5	0	85.0	81.0	126491106
8	Pick-Up Truck	75	1	40	50	0.5	0	75.0	71.0	12649110.6
							Lmax*	**91**	**Leq**	**87**
									Law	**119**

Source: LSA, July 2015.

1- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA
50	15.2	0.5	87
60	18.3	0.5	85
70	21.3	0.5	84
80	24.4	0.5	82
90	27.4	0.5	81
100	30.5	0.5	80
110	33.5	0.5	79
120	36.6	0.5	78
130	39.6	0.5	77
140	42.7	0.5	76
150	45.7	0.5	75
160	48.8	0.5	75
170	51.8	0.5	74
180	54.9	0.5	73
190	57.9	0.5	73
200	61.0	0.5	72
210	64.0	0.5	72
220	67.1	0.5	71
230	70.1	0.5	71
240	73.1	0.5	70
250	76.2	0.5	70
260	79.2	0.5	69
270	82.3	0.5	69
280	85.3	0.5	69
290	88.4	0.5	68
300	91.4	0.5	68
310	94.5	0.5	67
320	97.5	0.5	67
330	100.6	0.5	67
340	103.6	0.5	66
350	106.7	0.5	66
360	109.7	0.5	66
370	112.8	0.5	66

Mining Operations - Aggregate Plant

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Calculated (dBA) Leq	Energy
1	Dry Deck Screeb	75	1	100	50	0.5	0	75.0	75.0	31622776.6
2	Wet Screen	75	1	100	50	0.5	0	75.0	75.0	31622776.6
3	Conveyor Stacker	77	4	100	50	0.5	0	83.0	83.0	200474893
4	Radial Stacker	77	1	100	50	0.5	0	77.0	77.0	50118723.4
5	Water Pump	70	3	100	50	0.5	0	74.8	74.8	30000000
6	Feeder	77	1	100	50	0.5	0	77.0	77.0	50118723.4
7	Twin Screw	85	1	100	50	0.5	0	85.0	85.0	316227766
Source: LSA, July 2015.							**Lmax***	**89**	**Leq**	**89**
1- Percentage of time that a piece of equipment is operating at full power.									**Law**	**120**

dBA – A-weighted Decibels
Lmax- Maximum Level
Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA
50	15.2	0.5	89
60	18.3	0.5	87
70	21.3	0.5	85
80	24.4	0.5	83
90	27.4	0.5	82
100	30.5	0.5	81
110	33.5	0.5	80
120	36.6	0.5	79
130	39.6	0.5	78
140	42.7	0.5	77
150	45.7	0.5	77
160	48.8	0.5	76
170	51.8	0.5	75
180	54.9	0.5	75
190	57.9	0.5	74
200	61.0	0.5	73
210	64.0	0.5	73
220	67.1	0.5	72
230	70.1	0.5	72
240	73.1	0.5	71
250	76.2	0.5	71
260	79.2	0.5	71
270	82.3	0.5	70
280	85.3	0.5	70
290	88.4	0.5	69
300	91.4	0.5	69
310	94.5	0.5	69
320	97.5	0.5	68
330	100.6	0.5	68
340	103.6	0.5	68
350	106.7	0.5	67
360	109.7	0.5	67
370	112.8	0.5	67

Mining Operations - Aggregate Plant

Plant 1 — **Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements**

No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Calculated (dBA) Leq	Energy
1	Dry Deck Screeb	75	1	100	450	0.5	0	51.1	51.1	130134.883
2	Wet Screen	75	1	100	450	0.5	0	51.1	51.1	130134.883
3	Conveyor Stacker	77	4	100	450	0.5	0	59.2	59.2	824999.562
4	Radial Stacker	77	1	100	450	0.5	0	53.1	53.1	206249.89
5	Water Pump	70	3	100	450	0.5	0	50.9	50.9	123456.79
6	Feeder	77	1	100	450	0.5	0	53.1	53.1	206249.89
7	Twin Screw	85	1	100	450	0.5	0	61.1	61.1	1301348.83
							Lmax*	**65**	**Leq**	**64.7**
									Law	**96**

Source: LSA, July 2015.

1- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Plant 2 — **Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements**

No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Calculated (dBA) Leq	Energy
1	Dry Deck Screeb	75	1	100	890	0.5	0	43.7	43.7	23656.473
2	Wet Screen	75	1	100	890	0.5	0	43.7	43.7	23656.473
3	Conveyor Stacker	77	4	100	890	0.5	0	51.8	51.8	149971.932
4	Radial Stacker	77	1	100	890	0.5	0	45.7	45.7	37492.9829
5	Water Pump	70	3	100	890	0.5	0	43.5	43.5	22442.5008
6	Feeder	77	1	100	890	0.5	0	45.7	45.7	37492.9829
7	Twin Screw	85	1	100	890	0.5	0	53.7	53.7	236564.73
							Lmax*	**57**	**Leq**	**57.3**
									Law	**89**

Source: LSA, July 2015.

1- Percentage of time that a piece of equipment is operating at full power.

Feet	Meters	Ground Effect	No Shielding Leq dBA
50	15.2	0.5	65
60	18.3	0.5	63
70	21.3	0.5	61
80	24.4	0.5	60
90	27.4	0.5	58
100	30.5	0.5	57
110	33.5	0.5	56
120	36.6	0.5	55
130	39.6	0.5	54
140	42.7	0.5	53
150	45.7	0.5	53
160	48.8	0.5	52
170	51.8	0.5	51
180	54.9	0.5	51
190	57.9	0.5	50
200	61.0	0.5	50
210	64.0	0.5	49
220	67.1	0.5	49
230	70.1	0.5	48
240	73.1	0.5	48
250	76.2	0.5	47
260	79.2	0.5	47
270	82.3	0.5	46
280	85.3	0.5	46
290	88.4	0.5	46
300	91.4	0.5	45
310	94.5	0.5	45
320	97.5	0.5	45
330	100.6	0.5	44
340	103.6	0.5	44
350	106.7	0.5	44
360	109.7	0.5	43
370	112.8	0.5	43

APPENDIX C

FHWA TRAFFIC NOISE MODEL PRINTOUTS

TABLE Existing (2011)-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: Lake Jennings Rark Road - Blossom to El Monte
NOTES: Project Name - Existing (2011)

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13060 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.46

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	89.6	191.5	412.0

TABLE Existing (2011)-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: Lake Jennings Rark Road - El Monte to Ashwood
NOTES: Project Name - Existing (2011)

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10540 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	79.0	166.6	357.2

TABLE Existing (2011)-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: El Monte Road - North of Lake Jennings Road
NOTES: Project Name - Existing (2011)

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2500 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.86

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	63.8	137.0

TABLE Existing Plus Cumulative-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: Lake Jennings Rark Road - Blossom to El Monte
NOTES: Project Name - Existing Plus Cumulative

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15190 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.12

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	98.9	211.8	455.6

TABLE Existing Plus Cumulative-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: Lake Jennings Rark Road - El Monte to Ashwood
NOTES: Project Name - Existing Plus Cumulative

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12010 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES			
	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	85.8	181.6	389.6

TABLE Existing Plus Cumulative-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: El Monte Road - North of Lake Jennings Road
NOTES: Project Name - Existing Plus Cumulative

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2510 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 60.88

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	64.0	137.4

TABLE Existing Plus Cumulative Plus Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: Lake Jennings Rark Road - Blossom to El Monte
NOTES: Project Name - Existing Plus Cumulative Plus Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15610 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	EVENING	NIGHT
AUTOS	75.49	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.67	0.02	0.08

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.25

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	100.9	216.1	464.9

TABLE Existing Plus Cumulative Plus Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: Lake Jennings Rark Road - El Monte to Ashwood
NOTES: Project Name - Existing Plus Cumulative Plus Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12430 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.48	12.56	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.68	0.02	0.08

ACTIVE HALF-WIDTH (FT): 18 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	88.0	186.3	399.9

TABLE Existing Plus Cumulative Plus Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/18/2018
ROADWAY SEGMENT: El Monte Road - North of Lake Jennings Road
NOTES: Project Name - Existing Plus Cumulative Plus Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3330 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	73.52	12.20	9.06
M-TRUCKS	1.52	0.09	0.18
H-TRUCKS	3.33	0.02	0.08

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.26

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	92.0	197.7