Noise Analysis for the Lower Curtis Park Expansion

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1.0 EXISTING SETTING

1.1 Project Description

The City of Mission Viejo proposes to import approximately 760,000 cubic yards of dirt from freeway improvements that are currently underway by the California Department of Transportation (Caltrans) to Interstate 5 (I-5). The I-5 freeway improvement project extends from El Toro Road on the north to the San Joaquin Hills Toll Road (SR-73) on the south. Excess dirt from the freeway improvement project would be hauled by trucks to the 42.9-gross acre Lower Curtis Park site that is located approximately three miles east of I-5 (**Error! Reference source not found.**). The imported dirt would be graded into a pad that could be used for recreational use in the future (**Error! Reference source not found.**).

The existing 42.9-gross acre vacant site would require approximately 177,600 cubic yards of cut and remedial grading to prepare a pad site and provide access roads to the site to allow the approximately 760,000 cubic yards of dirt to be imported to the site. The 177,600 cubic yards of remedial cut would remain on the site and be incorporated into the grading for the future building pad. The 760,000 cubic yards of dirt would be hauled to the site over a period of three (3) years starting in the first quarter of 2020 and ending in 2022.

1.2 Background Information on Noise

1.2.1 Noise Criteria Background

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud; and 20 dB higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Exhibit 3 provides examples of various noises and their typical A-weighted noise level.

Exhibit 1 - Vicinity Map

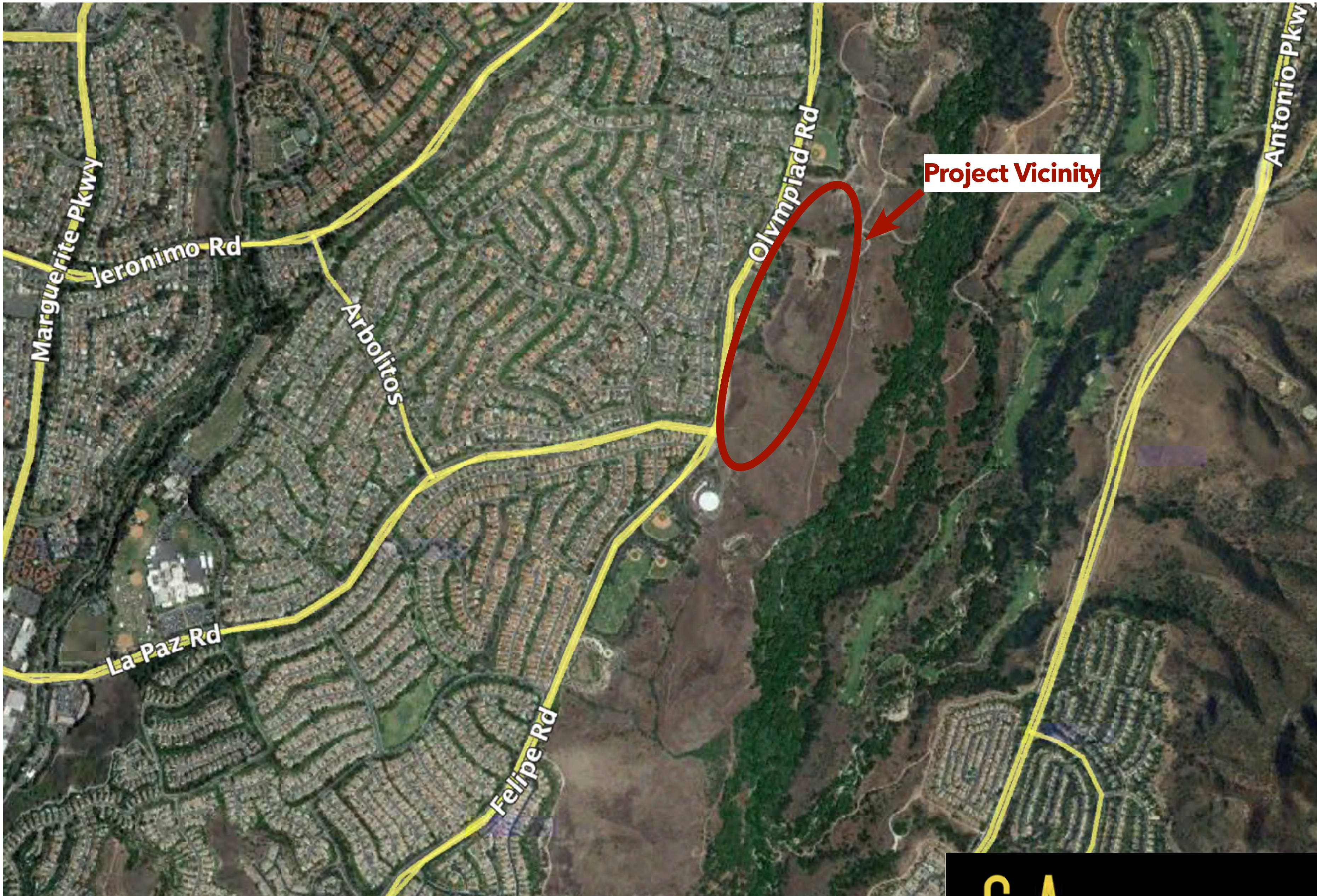

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Exhibit 2 - Grading Plan

Exhibit 3 - Typical Noise Levels

	Outdoor	Indoor
0 dBA	threshold of hearing (0 dBA)	
20	rustling of leaves (20 dBA)	whispering at 5 feet (20 dBA)
40	quiet residential area (40 dBA)	refrigerator (50 dBA)
60	air-conditioner at 100 feet (60 dBA) car at 25 feet at 65 mph (77 dBA)	sewing machine (60 dBA) normal conversation (60 to 65 dBA) dishwasher (55-70 dBA) living room music or TV (70 -75 dBA)
80	diesel truck at 50 feet at 40 mph (84 dBA) propeller airplane flyover at 1000 feet (88 dBA) motorcycle at 25 feet (90 dBA) lawnmower (96 dBA) backhoe at 50 feet (75-95 dBA)	garbage disposal (80 dBA) ringing telephone (80 dBA) vacuum cleaner (60-85 dBA) shouted conversation (90 dBA)
100	snowmobile (100 dBA) pile driver at 50 feet (90-105 dBA) car horn (110 dBA) rock concert (110 dBA) leaf blower (110 dBA)	baby crying on shoulder (110 dBA)
120	ambulance siren (120 dBA) stock car races (130 dBA) jackhammer (130 dBA)	
140		

Sources: League For The Hard Of Hearing, www.lhh.org
Handbook of Noise Control, McGraw Hill, Edited by Cyril Harris, 1979

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, thereby dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the effective perceived noise levels.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criterion is based on such known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance. Each of these potential noise impacts on people are briefly discussed in the following narratives:

> **Hearing loss** is not a concern in community noise situations of this type. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods, even in very noisy airport environs, are not sufficiently loud to cause hearing loss.
>
> **Speech interference** is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.
>
> **Sleep interference** is a major noise concern for traffic noise. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.
>
> **Physiological responses** are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are sign of harm.
>
> **Annoyance** is the most difficult of all noise responses to describe. Annoyance is a very individual characteristic and can vary widely from person to person. What one person considers tolerable can be quite unbearable to another of equal hearing capability.

1.2.2 Noise Assessment Metrics

The description, analysis and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. A-weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics can be divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly over or perhaps a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, which is typically 1 or 24-hours for community noise problems. For this type of analysis, cumulative noise metrics will be used.

Several rating scales have been developed for measurement of community noise. These account for: (1) the parameters of noise that have been shown to contribute to the effects of noise on man, (2) the variety of noises found in the environment, (3) the variations in noise levels that occur as a person moves through the environment, and (4) the variations associated with the time of day. They are designed to account for the known effects of noise on people described previously. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. Two of the predominate noise scales are the: Equivalent Noise Level (Leq) and the Community Noise Equivalent Level (CNEL). These scales are described in the following paragraphs.

> **Leq** is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. Leq is the "energy" average noise level during the time period of the sample. Leq can be measured for any time period, but is typically measured for 1 hour. It is the energy sum of all the events and background noise levels that occur during that time period.
>
> **CNEL**, Community Noise Equivalent Level, is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, while nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or simply "60 CNEL."
>
> **L(%)** (also sometimes represented as L(n) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period.

L(%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example, since 15 minutes is 25% of one hour, L(25) is the noise level that is equal to or exceeded for 15 minutes in a one-hour period. It is L(%) that is commonly used in Noise Ordinance standards. For example, many daytime County and City Noise Ordinances use an ordinance standard of 55 dBA for 30 minutes per hour or an L(50) level of 55 dBA. In other words, the Noise Ordinance states that no noise level should exceed 55 dBA for more than fifty percent of a given period. Lmax, which is L(0), is the maximum sound level during a measurement period.

1.3 Noise Criteria

The Noise Element of the General Plan and Noise Ordinance usually contain the City's policies on noise. The noise ordinance applies to noise on one property impacting a neighboring property. Typically, it sets limits on noise levels that can be experienced at the neighboring property. The Noise Ordinance is part of the City's Municipal Code and is enforceable throughout the City. The City of Mission Viejo has adopted a Noise Ordinance and relevant portions are discussed below.

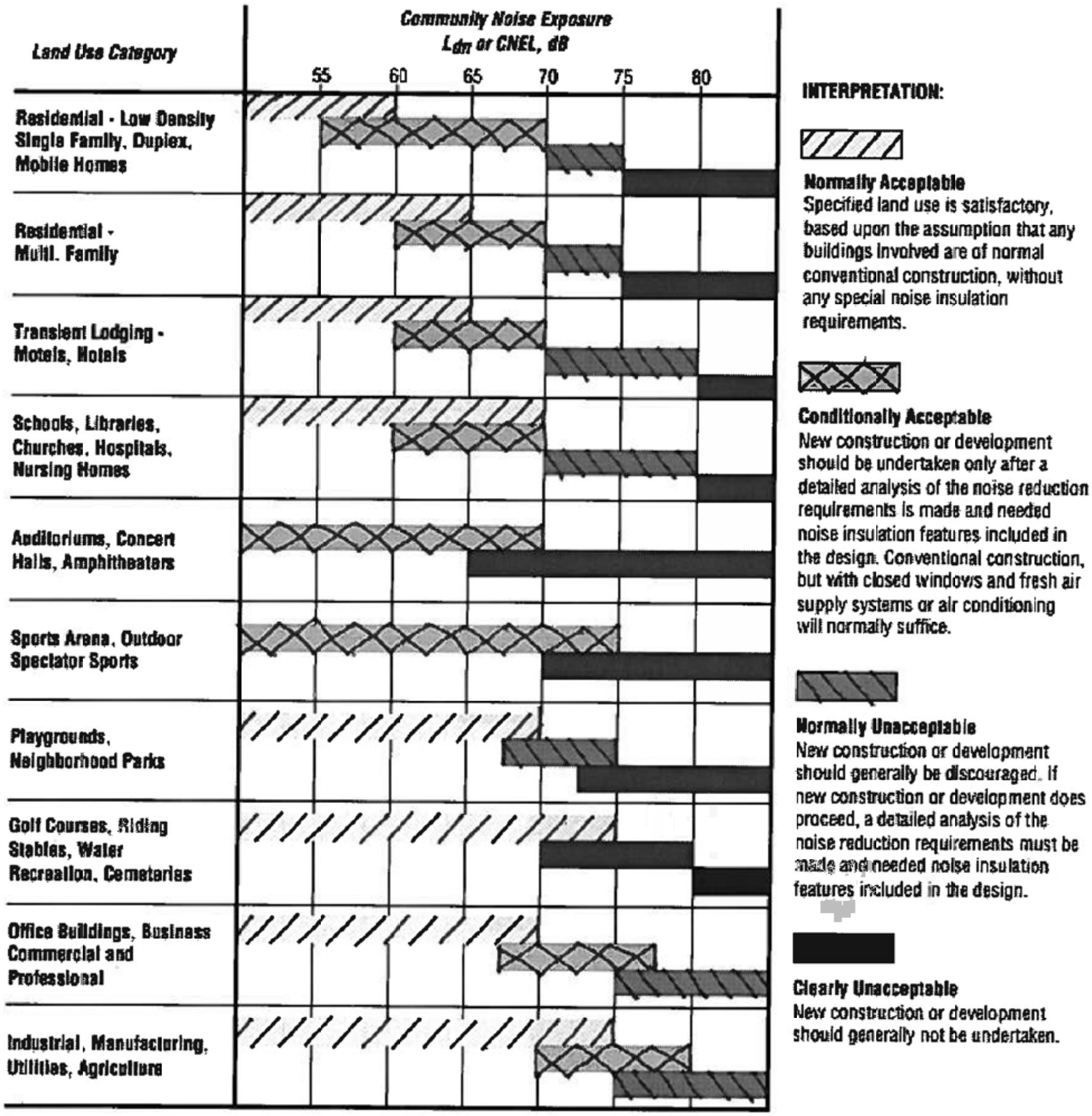
The City has not set specific noise standards for land uses. However, the Noise Element has established a land use/noise compatibility matrix which is designed to guide new developments.

1.3.1 Land Use Compatibility

The City of Mission Viejo has adopted a compatibility matrix for determining the compatibility of various land uses with noise levels. The primary goal of the compatibility matrix is to guide future development, and does not represent standards for existing developments. The guidelines are summarized in Exhibit 4. The guidelines rate compatibility in terms of "normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable."

A land use exposed to noise levels that are considered Normally Acceptable indicates that the land use is compatible with the noise environment and no special noise insulation is required. If new construction is exposed to a Conditionally Acceptable noise level a noise analysis is typically required to determine noise mitigation required to reduce noise levels to a compatible level. Conventional construction will normally suffice with a fresh air supply system or air conditioning to allow windows to remain closed. A noise analysis is also required for new construction exposed to a Normally Unacceptable noise level. The analysis is required to determine mitigation measures, which may be significant, to reduce noise levels to a compatible level. In general development is discouraged for land uses in areas this designation. Proposed development exposed to Clearly Unacceptable noise levels should generally not be undertaken.

Exhibit 4 - Mission Viejo Compatibility Matrix



Source: Table N-3 of the City of Mission Viejo Noise Element Technical Report

1.3.2 Mission Viejo Noise Ordinance

The Mission Viejo Noise Ordinance (Chapter 6.35 of the Municipal Code) contains requirements for noise generated on one parcel impacting another parcel. Specific noise limits are identified in the ordinance for operational noise. Since this project does not contain an operational phase those limits are not presented here.

The City's Noise Ordinance does contain a requirement for construction noise. Specifically, Section 6.35.060(5) allows construction and grading "provided such activities do not take place between the hours of 8:00 p.m. to 7:00 a.m. on weekdays and Saturdays, or at any time on Sunday or a federal holiday." As long as construction complies with these time limits, there are no limits on the noise that can be generated by construction.

1.4 Existing Noise Measurements

The existing noise levels in the vicinity of the proposed project and along haul routes are needed to establish the current baseline noise levels. A visual survey of the project site and the surrounding area was conducted to determine the location of a set of noise measurement sites that would provide a noise profile of the area in the vicinity of the project site. The primary criteria used for the site selection process were that the measurement site represent a noise sensitive land use, it is in the potential impact area, and sites along routes that will be used by the trucks associated with the project were given priority. Seven (7) sites were selected for noise measurements. The noise measurement locations are displayed in Exhibit 5. The measurements were taken on June 6, 2019 during daytime hours.

All noise measurements were performed using a Rion NL-52 Type 1 Sound Level Meter. During the measurements a large windscreen (i.e., a Rion WL-10 windscreen) covered the sound meter's microphone to eliminate unwanted wind-generated noise. Both before and after the set of measurements were taken, a Rion NC-74 Class 1 Sound Calibrator was used to check the calibration of the sound meter to ensure that the measured sound levels readings were accurate. Both pieces of equipment have current certification that is traceable to the National Institute of Standards and Technology (NIST). The monitoring system is Type 1, which is the highest rating available for environmental noise measurements. For each measurement site, 15 minutes of data were collected. At the conclusion of each set of measurements, the Leq, Lmin, Lmax, L1.7, L8, L25, and L50 values for the full-time period were written down on a data sheet. Prevailing weather conditions were noted along with any other factors that might affect the noise measurements. Table 1 shows the results of the measurements.

Exhibit 5 - Noise Measurement Locations

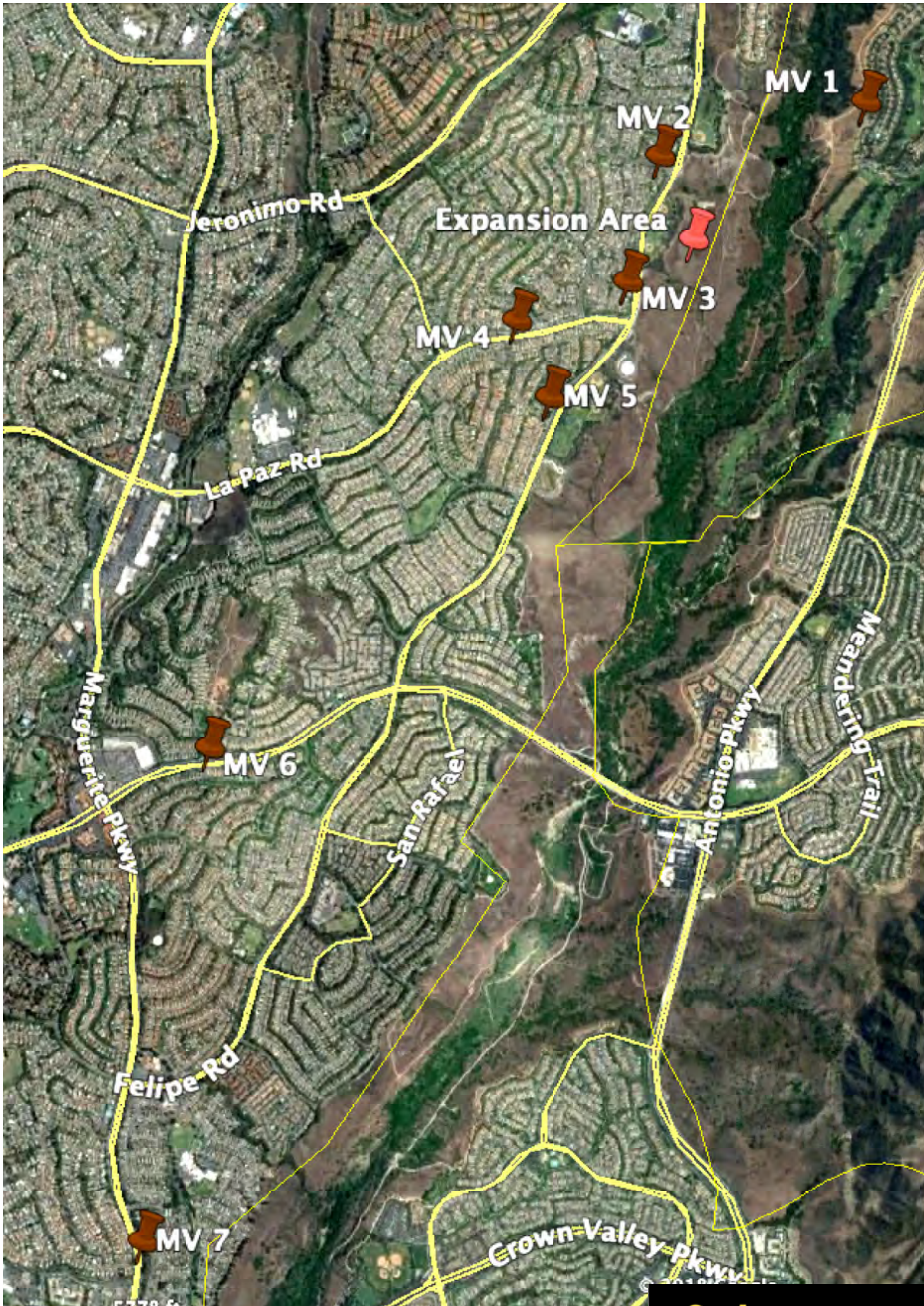


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Table 1 Existing Off-Site Noise Measurements (dBA)

Site	Start Time	Leq	Lmax	L1.7	L8	L25	L50	Lmin
1	10:52 a.m.	44.9	60.0	55.3	49.5	43.1	37.7	33.0
2	11:27 a.m.	48.6	63.9	56.4	53.0	48.8	45.1	35.4
3	11:49 a.m.	46.7	63.6	54.9	48.7	46.2	44.6	38.7
4	12:45 p.m.	64.4	78.4	72.4	68.8	65.4	60.8	38.9
5	1:12 p.m.	64.0	80.2	70.5	67.7	65.3	61.5	42.7
6	2:09 p.m.	66.6	76.9	72.6	70.3	68.1	65.3	42.7
7	2:33 p.m.	65.8	79.1	74.9	69.8	66.8	60.6	42.0

Sites 1, 2, and 3 represent quiet residential areas that surround the Curtis Park Expansion area. Site 1 lies to the northeast of the expansion area, while Sites 2 and 3 are on the opposite side of Felipe Road from the site. The noise levels for these three sites are all low, typical of a quiet suburban residential area. The average noise levels (Leq) are in the mid to upper 40 dBA range.

Sites 4, 5, 6, and 7 are along haul routes to the project site. All haul routes are on major roadways and the noise levels reflect the high levels of traffic experienced on these roads. The average noise levels (Leq) are in the mid 60 dBA range for all four sites.

1.5 Existing Roadway Noise Levels

The highway noise levels projected in this report were computed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December, 1978). The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used. CNEL contours are found by iterating over many distances until the distances to the 60, 65, 70, and 75 CNEL contours are found.

Existing average daily traffic (ADT) were provided by the traffic engineer (Stantec, November 2019). Posted speed limits and the ADTs were used with the FHWA Model to estimate the noise levels in terms of CNEL. The distances to the CNEL contours for the roadways in the vicinity of the project site are given in Table 2. These numbers represent the distance from the centerline of the road to the contour value shown. Note that the values given in Table 2 do not take into account the effect of any noise barriers or topography that may affect ambient noise levels.

Table 2 Existing Traffic Noise Levels

Roadway Segment	Extent of Segment	CNEL @ 100' *	Distance To CNEL Contour from Centerline of Roadway (feet)		
			70 CNEL	65 CNEL	60 CNEL
Haul Route 1					
La Paz Road	I-5 Freeway to Marguerite	65.7	51	111	239
La Paz Road	Marguerite Pkwy to Felipe Rd	62.8	33	72	155
Haul Route 2					
Oso Parkway	I-5 Freeway to Felipe Rd	68.1	74	160	345
Felipe Road	Oso Pkwy to Fieldcrest	63.8	39	83	179
Felipe Road	Fieldcrest to La Paz Rd	63.8	39	83	179
Haul Route 3					
Crown Valley Pkwy	I-5 Freeway to Marguerite	68.1	74	160	345
Marguerite Pkwy	Crown Valley Pkwy to Felipe	67.4	67	144	310
Felipe Road	Marguerite Pkwy to Oso Pkwy	63.8	39	83	179
Felipe Road	Oso Pkwy to Fieldcrest	63.8	39	83	179
Felipe Road	Fieldcrest to La Paz Rd	63.8	39	83	179

* From roadway centerline

Table 2 shows that the loudest roadways in the area are portions of Oso Parkway and Crown Valley Parkway. The roadways in the area have noise levels typical for a suburban area.

2.0 POTENTIAL NOISE IMPACTS

Potential noise impacts are commonly divided into two groups; temporary and long term. Temporary impacts are usually associated with noise generated by construction activities. Long-term impacts are caused by the operation of the project.

2.1 Thresholds of Significance

Off-site impacts from on-site activities, short-term and long-term, are measured against the Noise Ordinance criteria discussed in Section 1.3.2. Construction activities for the proposed project will be required to meet the noise ordinance standards along with any noise generating activities associated with the operation of the project. Similarly, the operations at the project site must be able to comply with the Noise Ordinance or a significant impact will occur.

Long-term off-site impacts from traffic noise are measured against two criteria. Both criteria must be met for a significant impact to be identified. First, project traffic must cause a substantial noise level increase (i.e., greater than 3 dB) on a roadway segment adjacent to a noise sensitive land use. Second, the noise level that will exist during construction must exceed the criteria level for the noise sensitive land use. In this case, the criteria level is 65 CNEL for residential land uses, schools, and other sensitive land uses. The project will have a significant impact if it causes a 3 dB increase and the resulting noise level is 65 CNEL or higher for sensitive land uses. In community noise assessment, changes in noise levels greater than 3 dB are often identified as significant, while changes less than 1 dB will not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. Note that there is no scientific evidence available to support the use of 3 dB as the significance threshold. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. In a community noise situation, however, noise exposures are over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB appears to be appropriate for most people.

Cumulative traffic noise increases also use a significance threshold of 3 dB. If the project contributes more than 1 dB to the cumulative increase, then it is considered to be a significant contributor to the cumulative impact.

2.2 Construction Noise Impacts Around Project Site

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, and concrete mixers can reach high levels. Construction noise generated at the site is discussed below. It should be noted that the City of Mission Viejo exempts construction noise as long as it occurs between 7:00 a.m. and 8:00 p.m. on a weekday and Saturday (refer to Section 1.3.2).

In general, the type of equipment that will be used for construction will be the type of equipment used for most grading projects. During clearing and grub and import placement phases, the most equipment will be operating. City of Mission Viejo indicates that during these construction phases a 824 compactor, two water trucks, a moto-grader, and dozer could be in operation.

Two residential locations were selected across Felipe Road from the grading area were selected as representative of locations along Felipe Road. They are represented as Sites A and B on Exhibit 6. These represent the worst-case locations in that they could be exposed to the highest levels of construction noise. Monitoring Site 5 (refer to Exhibit 5) was also analyzed to evaluate the closest receptors to the east. This site is referred to as Site C in the following discussion.

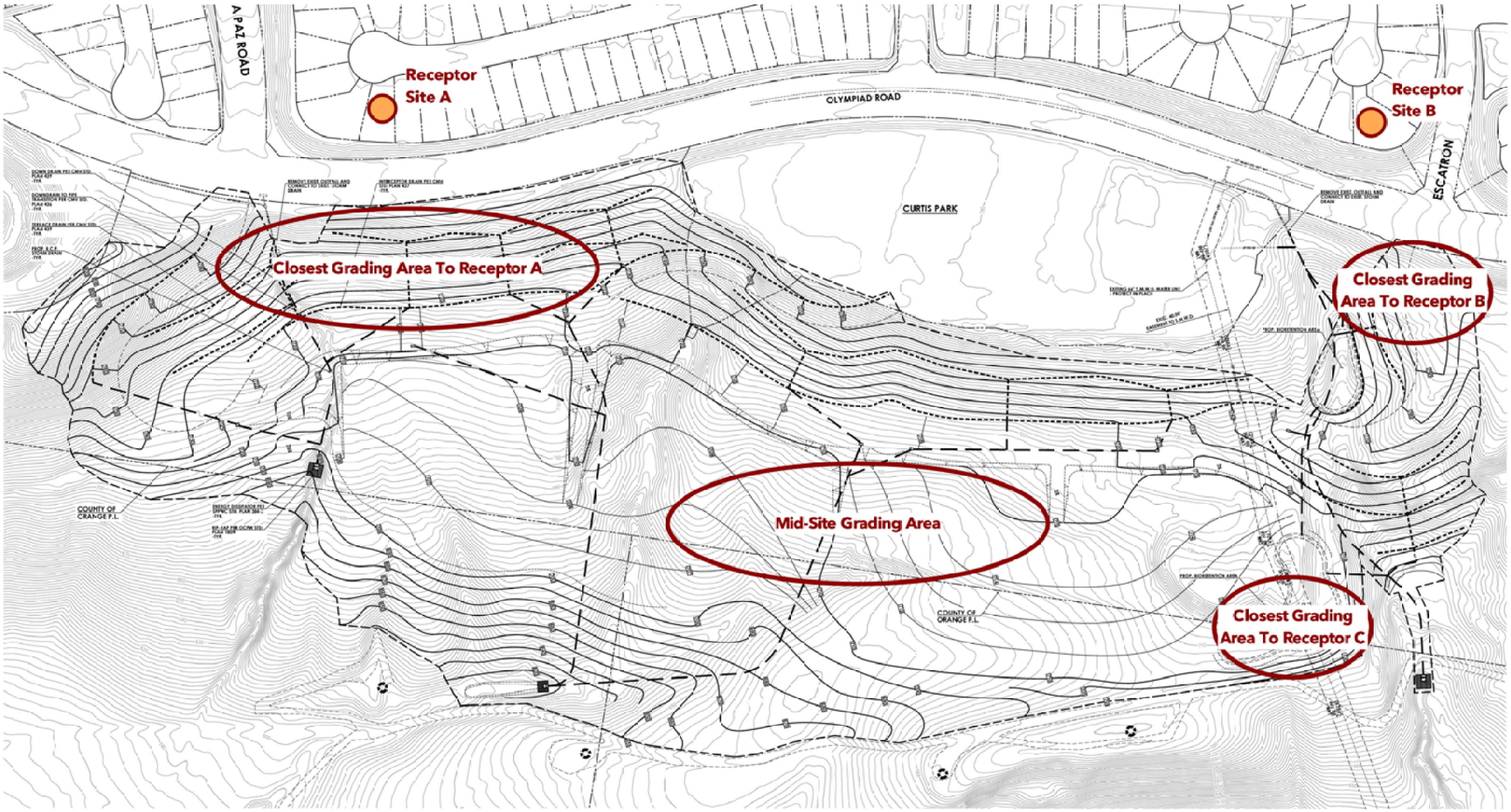
The Roadway Noise Construction Model (RNCM) developed by the Federal Highway Administration (FHWA) was used to project noise levels. A construction area closest to each of the receptors was evaluated. Additionally, a mid-site construction area was evaluated for all of the receptor locations. For the mid-site construction area, there will be topography that will reduce noise levels for Sites A and B. The results of the analysis are presented in Table 3, and calculations sheets are provided in the Appendix.

Table 3 Construction Noise Levels

	Closest Construction		Mid-Site Construction		Ambient Noise (dBA)	
	Leq	Lmax	Leq	Lmax	Leq	Lmax
Site A	68.7	69.7	51.2	52.2	46.7	63.6
Site B	67.7	68.8	47.8	48.9	48.6	63.9
Site C	50.9	51.9	48.6	49.6	44.9	60.0

Ambient noise levels (refer to Table 1) are also presented in Table 3. When construction is close to Sites A and B, the construction noise (Leq) will be well above ambient levels. When construction is mid-site the noise levels will be about the same as the ambient conditions. For all three sites, construction will be very audible and at time loud when construction is close by. When the construction is mid-site, which will be the majority of time, the noise levels will be close to ambient and should not be disruptive to the residents. None of the construction is planned for hours outside of the noise ordinance time exemption period. Even so, mitigation measures are proposed to ensure that construction noise is minimally intrusive as possible.

Exhibit 6 - Receptors Locations for Grading Noise



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2.3 Vibration Impacts Around Construction Site

The California Department of Transportation (Caltrans) has published the "Transportation and Construction-Induced Vibration Guidance Manual" (June 2004). This document has become the standard by which construction projects are evaluated for their vibration potential in California.

The most critical concern according to Caltrans is whether pile driving will be used. If pile driving is to be used then vibration levels can be high and a detailed analysis should be undertaken. Since pile driving is not proposed as part of this project, and no other unusual construction techniques are proposed that would have a high potential for vibration generation, it can be concluded that vibration impacts will not be significant with the proposed project.

2.4 Off-Site Traffic Noise Impacts Due to Haul Trucks

To determine traffic noise impacts as a result of the truck hauling operations, the FHWA (Federal Highway Administration) noise model was used. The FHWA noise model utilizes various traffic-flow parameters (e.g. traffic volume, speed, mix, etc.) to predict noise levels that result from the operation of motor vehicles on the roadways. Traffic volumes utilized were provided by Stantec, November 2019.

The noise levels associated with the existing traffic and existing truck with haul trucks were compared. Table 4 shows traffic noise CNEL level (dB) changes for this existing versus existing plus project comparison.

Table 4 CNEL Increases (dB) - Existing Versus Existing Plus Haul Trucks

Roadway Segment	Extent of Segment	Change in Level (dB)
Haul Route 1		
La Paz Road	I-5 Freeway to Marguerite	0.4
La Paz Road	Marguerite Pkwy to Felipe Rd	0.7
Haul Route 2		
Oso Parkway	I-5 Freeway to Felipe Rd	0.2
Felipe Road	Oso Pkwy to Fieldcrest	0.6
Felipe Road	Fieldcrest to La Paz Rd	0.6
Haul Route 3		
Crown Valley Pkwy	I-5 Freeway to Marguerite	0.2
Marguerite Pkwy	Crown Valley Pkwy to Felipe	0.3
Felipe Road	Marguerite Pkwy to Oso Pkwy	0.6
Felipe Road	Oso Pkwy to Fieldcrest	0.6
Felipe Road	Fieldcrest to La Paz Rd	0.6

The data in Table 4 indicates that the haul trucks will not contribute over 3 dB along any of the haul routes. The 3 dB criteria is part of the significance threshold determination. In fact, the greatest increase in noise due to haul trucks is 0.7 dB along La Paz Road. Therefore, there will be no significant impact due to haul truck traffic along any of the haul routes.

2.4.1 Cumulative Off-Site Traffic Noise Impacts

To determine cumulative traffic noise impacts as a result of the project plus other projects in the area, the FHWA (Federal Highway Administration) noise model was again used. Future traffic volumes utilized were provided by Stantec, November 2019. In addition to the existing case, traffic volumes were provided with the haul trucks associated with the project plus two additional projects that are planned in the area (see traffic report for details). Table 5 shows traffic noise CNEL level changes between existing conditions and existing plus haul trucks plus other projects.

Table 5 Cumulative Traffic Noise CNEL Increases (dB) (Cumulative with Project Versus Existing)

Roadway Segment	Extent of Segment	Change in Level (dB)
Haul Route 1		
La Paz Road	I-5 Freeway to Marguerite	0.4
La Paz Road	Marguerite Pkwy to Felipe Rd	0.7
Haul Route 2		
Oso Parkway	I-5 Freeway to Felipe Rd	0.2
Felipe Road	Oso Pkwy to Fieldcrest	0.6
Felipe Road	Fieldcrest to La Paz Rd	0.6
Haul Route 3		
Crown Valley Pkwy	I-5 Freeway to Marguerite	0.2
Marguerite Pkwy	Crown Valley Pkwy to Felipe	0.3
Felipe Road	Marguerite Pkwy to Oso Pkwy	0.6
Felipe Road	Oso Pkwy to Fieldcrest	0.6
Felipe Road	Fieldcrest to La Paz Rd	0.6

The additional two projects do not add significant traffic noise along the haul routes. The greatest cumulative increase in noise is 0.7 dB along La Paz Road between Marguerite Parkway and Felipe Road. This increase is below the 3 dB significance threshold and therefore, cumulative noise increases will not occur.

3.0 MITIGATION MEASURES

3.1 Impacts Around Project Site

Construction at Lower Curtis Park is not projected to cause a significant impact. However, the following measures are proposed to minimize noise generated by construction.

1. The construction contractor shall limit construction activities to between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday. No construction shall be permitted outside of these hours or on Sundays and federal holidays.
2. During all project site excavation and grading, the project contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.

3.2 Impacts Along Haul Routes

Significant increases in noise will not occur along haul routes. Therefore, mitigation measures are not needed.

3.3 Cumulative Impacts

Significant cumulative noise impacts will not occur.

4.0 UNAVOIDABLE SIGNIFICANT IMPACTS

The mitigation measures described above will mitigate all significant impacts to a level of insignificance. The project will not result in an unavoidable significant impact.

APPENDIX

TRAFFIC DATA FOR HAUL ROUTES (AVERAGE DAILY TRAFFIC)

Roadway	Extent	Existing	Project (1)	Existing Plus Project	Cumulative No Project	Cumulative With Project
Haul Route 1						
La Paz Road	I-5 Freeway to Marguerite Pkwy	31,000	300	31,300	31,264	31,564
La Paz Road	Marguerite Pkwy to Felipe Rd	12,000	300	12,300	12,000	12,300
Haul Route 2						
Oso Parkway	I-5 Freeway to Felipe Rd	40,000	300	40,300	40,000	40,300
Felipe Road	Oso Pkwy to Fieldcrest	15,000	300	15,300	15,000	15,300
Felipe Road	Fieldcrest to La Paz Rd	15,000	300	15,300	15,000	15,300
Haul Route 3						
Crown Valley Pkwy	I-5 Freeway to Marguerite Pkwy	40,000	300	40,300	40,199	40,499
Marguerite Pkwy	Crown Valley Pkwy to Felipe Rd	34,000	300	34,300	34,000	34,300
Felipe Road	Marguerite Pkwy to Oso Pkwy	15,000	300	15,300	15,000	15,300
Felipe Road	Oso Pkwy to Fieldcrest	15,000	300	15,300	15,000	15,300
Felipe Road	Fieldcrest to La Paz Rd	15,000	300	15,300	15,000	15,300

1. Haul trucks

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/11/2019
Case Description: Lower Curtis Park

**** Receptor #1 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site A	Residential	70.0	65.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compactor (ground)	No	20		83.2	291.0	0.0
Grader	No	40	85.0		291.0	0.0
Dozer	No	40		81.7	291.0	0.0
Flat Bed Truck	No	40		74.3	291.0	0.0
Flat Bed Truck	No	40		74.3	291.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq

Compactor (ground)	67.9	60.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	69.7	65.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	66.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	59.0	55.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	59.0	55.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.7	68.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site B	Residential	70.0	65.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compactor (ground)	No	20		83.2	324.0	0.0
Grader	No	40	85.0		324.0	0.0
Dozer	No	40		81.7	324.0	0.0
Flat Bed Truck	No	40		74.3	324.0	0.0
Flat Bed Truck	No	40		74.3	324.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compactor (ground)	67.0	60.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.8	64.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	65.4	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	58.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	58.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.8	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #3 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site C	Residential	70.0	65.0	60.0

Equipment

		Spec	Actual	Receptor	Estimated
Impact	Usage	Lmax	Lmax	Distance	Shielding

Description	Device	(%)	(dBA)	(dBA)	(feet)	(dBA)
Compactor (ground)	No	20		83.2	2247.0	0.0
Grader	No	40	85.0		2247.0	0.0
Dozer	No	40		81.7	2247.0	0.0
Flat Bed Truck	No	40		74.3	2247.0	0.0
Flat Bed Truck	No	40		74.3	2247.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compactor (ground)	50.2	43.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	51.9	48.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	48.6	44.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.2	37.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	41.2	37.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	51.9	50.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

LOWER CURTIS PARK
MID SITE CALCULATIONS

Total Noise Level	*68.7*	**dBA**	**at**	*291.0*	**feet**

Critical Freq. (Hz)	*500*
Noise Level at 50'	84.0

To get other noise levels, Put in Distances

Dist.	dBA
50	84.0
221	71.1
379	66.4
1380	55.2

To get other distances, Put in other noise levels.

dBA	Dist.
50	2,505
55	1,409
60	792
65	446

Receptor	Source Elevation	Distance To Wall	Base Of Wall	Dist. To Observer	Pad Elevation	Observer Height	Wall Height	****Barrier Reduction****	*Noise Level* (Leq dBA)
Site A	*712.0*	*926*	*800*	*1170*	*812*	*5*	*0.0*	5.4	**51.2**
Site B	*712.0*	*570*	*790*	*1182*	*828*	*5*	*0.0*	8.7	**47.8**
Site C	*712.0*	*50*	*600*	*2945*	*730*	*5*	*0.0*	0.0	**48.6**