

Appendix G

Shiloh West Medical, Noise Impact Study

MD Acoustics

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Shiloh West Medical Noise Impact Study City of Victorville, CA

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TABLE OF CONTENTS

1.0	Introduction	1
1.1	Purpose of Analysis and Study Objectives	1
1.2	Site Location and Study Area	1
1.3	Proposed Project Description	1
2.0	Fundamentals of Noise	4
2.1	Sound, Noise, and Acoustics	4
2.2	Frequency and Hertz	4
2.3	Sound Pressure Levels and Decibels	4
2.4	Addition of Decibels	4
2.5	Human Response to Changes in Noise Levels	5
2.6	Noise Descriptors	5
2.7	Traffic Noise Prediction	6
2.8	Sound Propagation	6
3.0	Ground-Bourne Vibration Fundamentals	8
3.1	Vibration Descriptors	8
3.2	Vibration Perception	8
3.3	Vibration Propagation	8
4.0	Regulatory Setting.....	10
4.1	Federal Regulations	10
4.2	State Regulations	10
4.3	City of Victorville Noise Regulations	11
5.0	Study Method and Procedure.....	14
5.1	Noise Measurement Procedure and Criteria	14
5.2	Noise Measurement Location	14
5.3	Stationary Noise Modeling	14
6.0	Existing Noise Environment	17
6.1	Long-Term Noise Measurement Results	17
7.0	Future Noise Environment Impacts and Mitigation	18
7.1	Future Exterior Noise	18
7.1.1	Noise Impacts to Off-Site Receptors Due to Stationary Sources	18
8.0	Construction Noise Impact	21
8.1	Construction Noise	21
8.2	Construction Vibration	22
9.0	References	24

LIST OF APPENDICES

Appendix A:	Field Measurement Data	1
Appendix B:	Referenced Traffic Data	2
Appendix C:	SoundPLAN Input and Output.....	3
Appendix D:	Construction Modeling Output.....	4

LIST OF EXHIBITS

Exhibit A:	Location Map	2
Exhibit B:	Site Plan.....	3
Exhibit C:	Typical A-Weighted Noise Levels	4
Exhibit D:	Land Use Compatibility Guidelines	11
Exhibit E:	Measurement Locations	16
Exhibit F:	Operational Noise Levels	20

LIST OF TABLES

Table 1:	Base Ambient Noise Levels	12
Table 2:	Reference Sound Level Measurements for SoundPlan Model	15
Table 3:	Worst-case Predicted Operational Noise Levels (dBA).....	19
Table 4:	Typical Construction Equipment Noise Levels ¹	21
Table 5:	Guideline Vibration Damage Potential Threshold Criteria	22
Table 6:	Vibration Source Levels for Construction Equipment ¹	23

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

This noise assessment was prepared to evaluate the potential noise impacts for the project study area and to recommend noise mitigation measures, if necessary, to minimize the potential noise impacts. The assessment was conducted and compared to the noise standards set forth by the Federal, State, and Local agencies. Consistent with the City's Noise Guidelines, the project must demonstrate compliance to the applicable noise criterion as outlined within the City's Noise Element and Municipal Code.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- A description of the local noise guidelines and standards
- An analysis of traffic noise impacts to and from the project site
- An analysis of stationary noise impacts to and from the project site
- An analysis of construction noise impacts

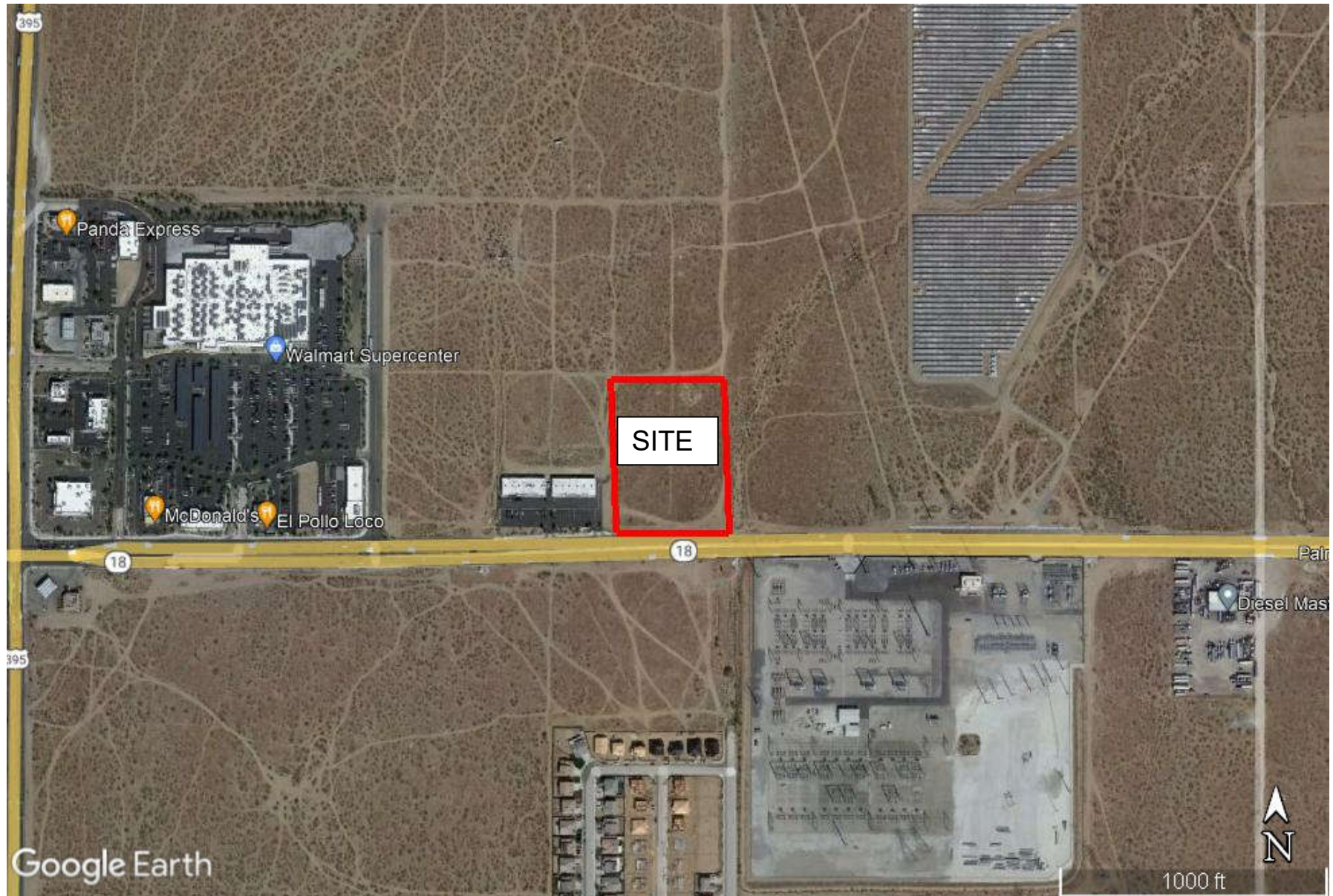
1.2 Site Location and Study Area

The project site is on 3 acres located on parcels 3103-561-19 and 20 on the north side of Palmdale Road in Victorville, California, as shown in Exhibit A. Per the City's General Plan Land Use & Zoning Districts map, the current land use zoning district is Commercial Neighborhood Retail/Service (C-1) and the land uses surrounding the project site are commercial including a commercial planned urban development zone to the north. The project's proposed use is a medical office building.

1.3 Proposed Project Description

The Project proposes to develop two medical office buildings on the site. Phase A will be a 10,111-square foot building with 6,267 square feet of medical office with a 149-square foot common area, a 1,156-square foot lab, a 1,260-square foot pharmacy, and a 1,279-square foot coffee shop with a drive-thru. Phase B will be a 20,729-square foot medical office building. The site will have 153 parking spaces and cover 3 acres.

Exhibit A Location Map





2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise, and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

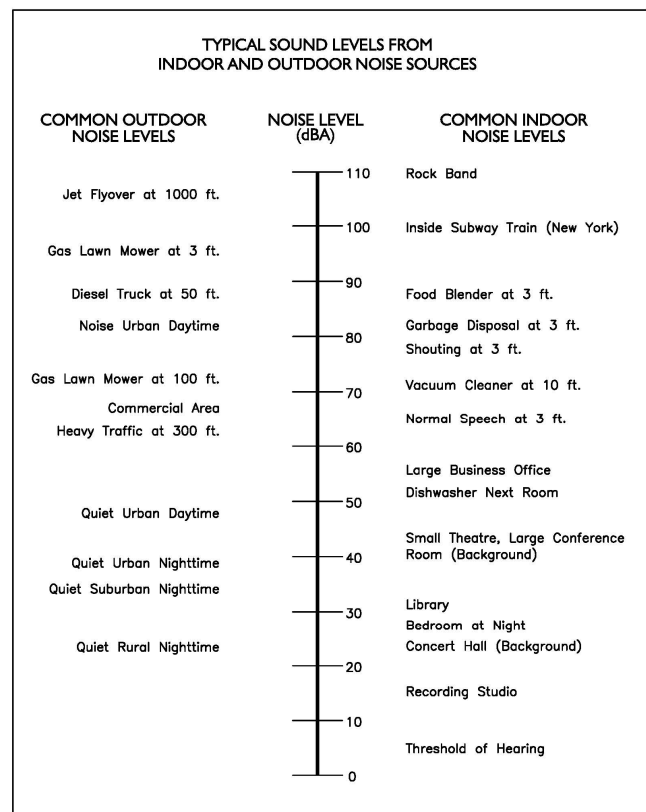
2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting at 20 Hz to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m²), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.0000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels abbreviated dB. Exhibit C illustrates references sound levels for different noise sources.

Exhibit C: Typical A-Weighted Noise Levels



2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels.

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after the addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB): A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A): A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time-varying noise level. The energy average noise level during the sample period.

Habitable Room: Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking, or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms, and similar spaces.

L(n): The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90, and L99, etc.

Noise: Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area: Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels: See L(n).

Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL): The dB(A) level which, if it lasted for one second, would produce the same A-weighted sound energy as the actual event.

2.7 Traffic Noise Prediction

Noise levels associated with traffic depend on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2 axle), and heavy truck percentage (3 axle and greater), and sound propagation. A greater volume of traffic, higher speeds, and larger truck percentages equate to a louder volume in noise. A doubling of the Average Daily Traffic (ADT) along a roadway will increase noise levels by approximately 3 dB; reasons for this are discussed in the sections above.

2.8 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading

versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt, or landscaping attenuate noise at a rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 7.5 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located over 200 feet from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

3.0 Ground-Borne Vibration Fundamentals

3.1 Vibration Descriptors

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

Several different methods are used to quantify vibration amplitude.

PPV – Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS – Known as root mean squared (RMS) can be used to denote vibration amplitude

VdB – A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

3.3 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wavefront, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wavefront. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wavefront. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be

effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 Regulatory Setting

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

4.1 Federal Regulations

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

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) originally was tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The federal government advocates that local jurisdiction use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being constructed adjacent to a highway or that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

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

4.2 State Regulations

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

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan.

The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable as illustrated in Exhibit D and can be found in the City's General Plan Noise Element.

Exhibit D: Land Use Compatibility Guidelines

Table N-3 Victorville Land Use Compatibility Standards							
	Community Noise Exposure Ldn or CNEL, dB						
Land Use Categories	55	60	65	70	75	80 +	
Residential - Low Density, Single Family, Duplex, Multi-family, Mobile Home	1	1	2	2	3	4	4
Transient Lodging - Motels, Hotels	1	1	2	2	3	3	4
Schools, Libraries, Churches, Hospitals, Nursing Homes	1	1	2	3	3	4	4
Auditoriums, Concert Halls, Amphitheaters	2	2	3	3	4	4	4
Sports Arena, Outdoor Spectator Sports	2	2	2	2	3	3	3
Playgrounds, Neighborhood Parks	1	1	1	2	3	3	3
Golf Courses, Riding Stables, Water Recreation, Cemeteries	1	1	1	2	2	4	4
Office Buildings, Business Commercial, Retail Commercial and Professional	1	1	1	2	2	3	3
Industrial, Manufacturing, Utilities	1	1	1	1	2	2	2
Agriculture	1	1	1	1	1	1	1
Legend: 1. NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. 2. CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and Schools, Libraries, Churches, Hospitals, Nursing Homes 1 needed noise insulation features included in the design. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice. 3. NORMALLY UNACCEPTABLE: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. 4. CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.							

4.3 City of Victorville Noise Regulations

The City of Victorville outlines their noise regulations and standards within the Noise Element from the General Plan and the Noise Ordinance from the Municipal Code.

Stationary Noise Regulations

Applicable policies and standards governing environmental noise in the City are set forth in the General Plan Noise Element, and Chapter 13.10 of the Victorville Municipal Code outlines the acceptable maximum noise standards. Section 13.01.040 defines base ambient levels for respective times and zones as shown in Table 1.

Table 1: Base Ambient Noise Levels

Zone	Time	Sound Level Decibels
All residential zones	10:00 p.m. — 7:00 a.m.	55 dB(A)
All residential zones	7:00 a.m. — 10:00 p.m.	65 dB(A)
All commercial zones	Anytime	70 dB(A)
All industrial zones	Anytime	75 dB(A)

If the ambient noise level exceeds the applicable limit as noted in the above table, the ambient noise level shall be the standard.

Construction Noise Regulations

Section 13.01.060(9) – Noise Source Exemptions

Construction activity on private properties that are determined by the director of building and safety to be essential to the completion of a project.

General Plan

The following are Goals, Objectives, and Policies from the General Plan Noise Element which relate to the project:

GOAL #1: NOISE SENSITIVITY. IDENTIFY SIGNIFICANT NOISE SOURCES THAT COULD ADVERSELY AFFECT COMMUNITY.

Objective 1.1: Locate noise sensitive land uses away from existing excessive noise sources, and locate new excessive noise generators away from existing sensitive land uses.

Policy 1.1.1: Implement Table N-3 (Exhibit D in this report) regarding placement of new land uses.

Implementation Measure 1.1.1.1: Continue to assess projects through the subdivision, site plan, conditional use permit, and other development review processes and incorporate conditions of approval which ensure noise compatibility where appropriate.

GOAL #2: NOISE CONTROL. MANAGE THE AFFECTS OF NOISE EMISSIONS TO HELP ENSURE REDUCTION OF ADVERSE AFFECTS ON THE COMMUNITY.

Objective 2.1: Ensure existing and future noise sources are properly attenuated.

Policy 2.1.1: Continue to implement acceptable standards for noise for various land uses throughout the City.

Implementation Measure 2.1.1.2: Monitor noise complaints and enforce provisions of the City noise ordinance.

Implementation Measure 2.1.1.5: Continue to restrict noise and require mitigation measures for any noise-emitting construction equipment or activity.

5.0 Study Method and Procedure

The following section describes the noise modeling procedures and assumptions used for this assessment.

5.1 Noise Measurement Procedure and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

MD conducted the sound level measurements in accordance with Caltrans technical noise specifications and the City's noise ordinance. All measurements equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA). The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed 5-feet above the ground for all measurements
- Sound level meters were calibrated (Larson Davis CAL 200) before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Results of the long-term noise measurements were recorded on field data sheets
- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawnmowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

5.2 Noise Measurement Location

The noise monitoring location was selected based on the distance of the project's stationary noise sources to the nearest sensitive on-site receptors and the ambient noise producers. One (1) long-term noise measurement was conducted on the project site and represents ambient levels at the site. Appendix A includes photos, a field sheet, and measured noise data. Exhibit E illustrates the location of the measurement.

5.3 Stationary Noise Modeling

SoundPLAN (SP) acoustical modeling software was utilized to model future worst-case stationary noise impacts to the adjacent land uses. SP is capable of evaluating multiple stationary noise source impacts at various receiver locations. SP's software utilizes algorithms (based on the inverse square law and reference equipment noise level data) to calculate noise level projections. The software allows the user to input

specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations.

The future worst-case noise level projections were modeled using referenced sound level data for the various stationary on-site sources (parking spaces, HVAC, drive-thru noise). The model assumes that the project has a total of 160 vehicle parking spaces, 88 tons of HVAC units, and a drive-thru speaker board operating continuously. Table 2 outlines the reference noise levels used for the model. The model assumes an idling car along the drive-thru queue every six feet.

Table 2: Reference Sound Level Measurements for SoundPLAN Model

Source	Source Type	Reference Level (dBA)	Descriptor
Parking	Area (SP Parking tool)	-	2 movements per hr
5-Ton HVAC Unit	Point	67.7	3 ft
Drive-Thru Speaker	Point	62.1	3 ft
Drive-Thru Cars	Line (per meter)	58.7	3 ft

The cars idling and coming and going in the parking spots were modeled at 2 movements per hour, which would account for 320 trips in an hour. This accounts for more parking movements than the 200 peak-hour trips from the project traffic study.

The SP model assumes that all noise sources are operating simultaneously (worst-case scenario) when in actuality, the noise will be intermittent and lower in noise level.

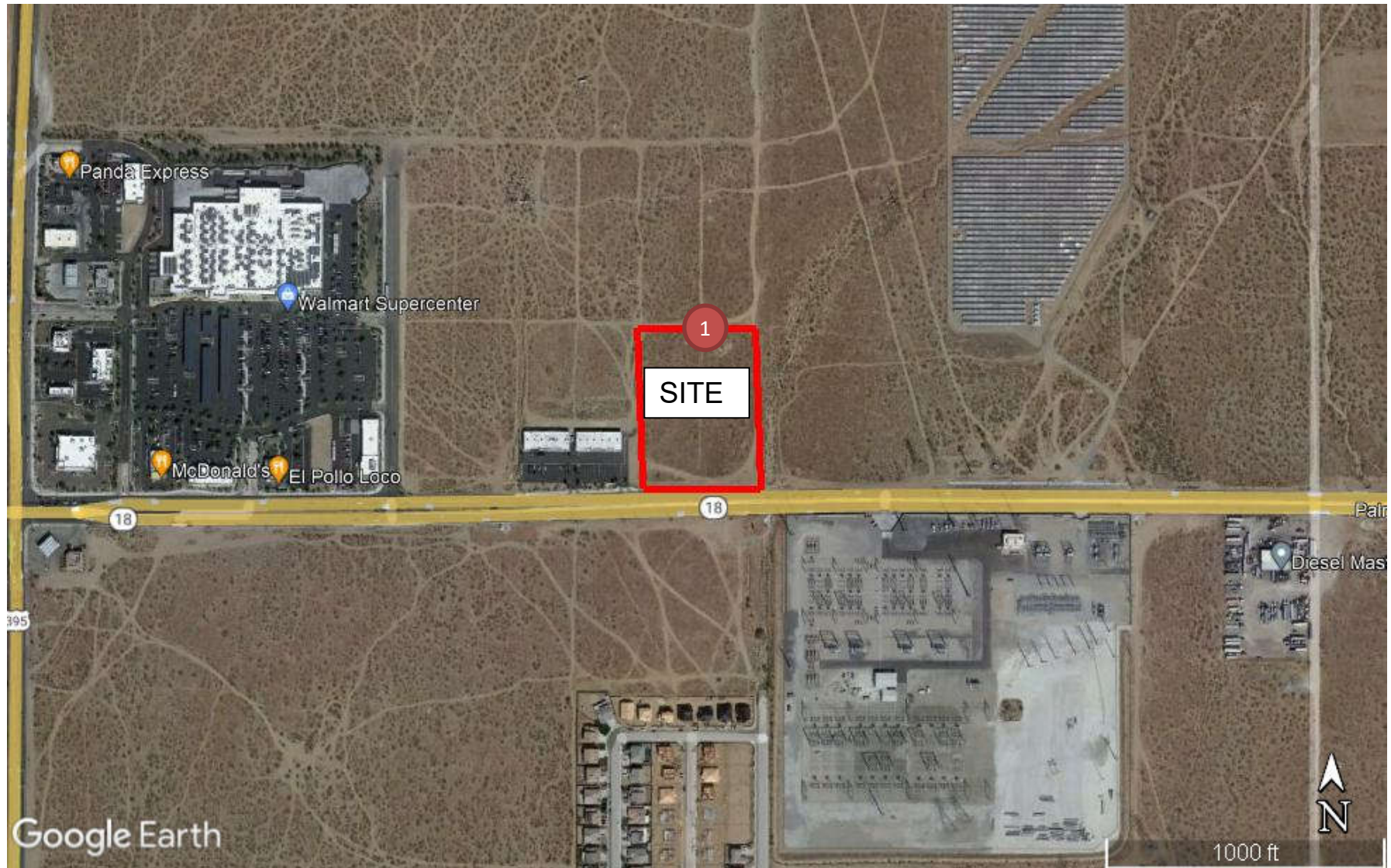
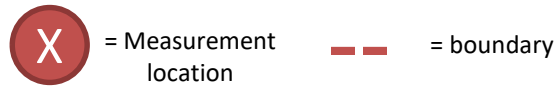
Finally, the model is able to evaluate the noise-attenuating effects of any existing or proposed property line walls. Input and output calculations are provided in Appendix C.

5.4 FHWA Roadway Construction Noise Model

The construction noise analysis utilizes the FHWA Roadway Construction Noise Model (RNCM) and FTA, together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, % usage factor, and baseline parameters for the project site.

The project was analyzed based on the different construction phases. Construction noise is expected to be loudest during the grading phase of construction. The construction noise calculation output worksheet is located in Appendix D.

Exhibit E Measurement Locations



6.0 Existing Noise Environment

One (1) 24-hour ambient noise measurement was conducted at the project site from 2/11/22 to 2/12/22. The long-term noise monitoring location is illustrated in Exhibit E. The measurement measured the Leq, Lmin, Lmax and other statistical data (e.g. L2, L8). The noise measurement was taken to determine the existing baseline noise conditions.

6.1 Long-Term Noise Measurement Results

Noise data indicates the ambient noise level ranged between 43 to 56 dBA Leq at the project site. The overall DNL level was 57 dBA. Additional field notes and photographs are provided in Appendix A. The quietest hourly level was 43 dBA Leq at 3 AM on 2/12/2022. MD will compare the maximum operational levels to the minimum ambient level to determine the maximum impact from the project operations.

7.0 Future Noise Environment Impacts and Mitigation

This assessment analyzes future noise impacts to and from the project and compares the results to the City's Noise Standards. The analysis details the estimated exterior noise levels associated with traffic from adjacent roadways and from on-site stationary noise sources.

7.1 Future Exterior Noise

The following outlines the exterior noise levels associated with the proposed project.

7.1.1 Noise Impacts to Off-Site Receptors Due to Stationary Sources

Due to the location of the proposed facilities, receptors that may be affected by project operational noise include the uses to the east and west. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. The model utilizes SoundPLAN's sound level data for the parking specified within Section 5.4 of this report. Loading activity constitutes the project's maximum operational noise levels.

A total of four (4) receptor locations were modeled to evaluate the proposed project's operational noise impact to adjacent noise sensitive land uses. A receptor is denoted by a yellow dot in Exhibit F. The receptors are on the north and east property lines.

Project Operational Noise Levels

Exhibit F shows the "project only" operational noise levels at the property lines and/or sensitive receptor areas and illustrates how the noise will propagate at the site. Worst-case operational noise levels are anticipated to range between 46 to 56 dBA Leq at the commercial receptors and 48 dBA Leq at the planned urban development receptor. The noise projections are below the City's noise limits as given in Section 13.01.040 of the Municipal Code.

Project Plus Ambient Operational Noise Levels

Table 3 demonstrates the project plus ambient noise levels. Project plus ambient noise level projections are anticipated to range between 48 to 56 dBA Leq at the commercial receptors and 49 dBA at the planned urban development receptor.

<Table 3 Next Page>

Table 3: Worst-case Predicted Operational Noise Levels (dBA)

Receptor ¹	Existing Ambient Noise Level (dBA, Leq) ²	Project Noise Level (dBA, Leq)	Total Combined Noise Level (dBA, Leq) ³	City (7AM-10PM) Daytime Noise Limit	Change in Noise Level as Result of Project
R1	43	56	56	70	13
R2	43	48	49	70	6
R3	43	55	55	70	12
R4	43	46	48	70	5
Notes: ¹ Receptor locations in Exhibit F. R1-R4 are commercial. ² The lowest measured ambient Leq. ³ Victorville daytime commercial noise limits. Section 13.01.040 of the Municipal Code.					

In addition, Table 3 provides the anticipated change in noise level as a result of the proposed project during daytime operable conditions.

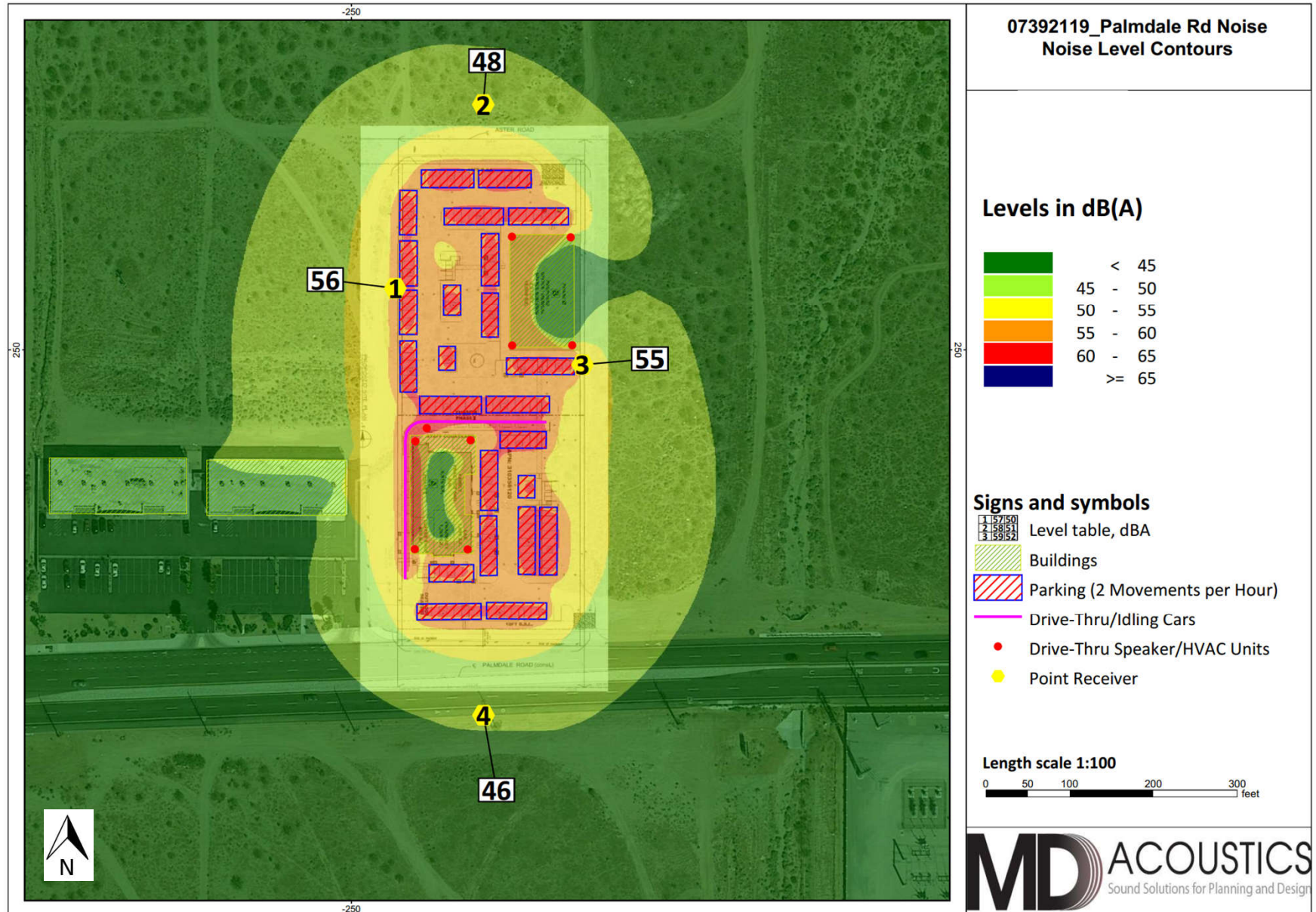
As already demonstrated, the project's maximum operational noise levels do not exceed the City's noise limit given by City's Municipal Code of 70 dBA Leq at the commercial zones.

7.1.2 Noise Impacts to Off-Site Receptors Due to Project Generated Traffic

The project will generate an estimated 1,585 total daily per the project's traffic study. Palmdale Road has an ADT of 19,300 per the 2022 Caltrans Traffic Census Program annual average daily traffic. The change in traffic will change the overall noise by less than 1 dB and will therefore be less than significant.

Exhibit F

Operational Noise Levels



8.0 Construction Noise Impact

The degree of construction noise may vary for different areas of the project site and also vary depending on the construction activities. Noise levels associated with the construction will vary with the different phases of construction.

8.1 Construction Noise

The Environmental Protection Agency (EPA) has compiled data regarding the noise generated characteristics of typical construction activities. The data is presented in Table 4.

Table 4: Typical Construction Equipment Noise Levels¹
Equipment Powered by Internal Combustion Engines

Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Type	Noise Levels (dBA) at 50 Feet
Saws	71 - 82
Vibrators	68 - 82
Notes: ¹ Referenced Noise Levels from the Environmental Protection Agency (EPA)	

Construction is considered a short-term impact. Construction noise will have a temporary or periodic increase in the ambient noise level above the existing within the project vicinity. Construction is exempt per Section 13.01.060(9) of the Victorville Municipal Code. However, construction noise projections are provided. Additionally, the FTA commercial construction noise guideline of 85 dBA Leq will be used for a significance determination.

Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Noise levels will be

loudest during the grading phase. MD calculated construction noise levels at the nearest existing commercial properties to the site. Levels at the nearest commercial property located to the west of the site are calculated to be up to 73 dBA Leq. Construction noise level projections are provided in Appendix D. The level is below the FTA Noise and Vibration Manual's criteria of 85 dBA Leq for construction noise at commercial properties. The impact is considered less than significant.

8.2 Construction Vibration

Construction activities can produce vibration that may be felt by adjacent land uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary vibration source during construction may be from a bulldozer. A large bulldozer has a vibration impact of 0.089 inches per second peak particle velocity (PPV) at 25 feet which is likely perceptible but below any risk to architectural damage.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{\text{equipment}} = PPV_{\text{ref}} (25/D_{\text{rec}})^n$$

Where: PPV_{ref} = reference PPV at 25ft.

D_{rec} = distance from equipment to receiver in ft.

$n = 1.1$ (the value related to the attenuation rate through ground)

The thresholds from the Caltrans Transportation and Construction Induced Vibration Guidance Manual in Table 5 (below) provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 5: Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5
Source: Table 19, Transportation and Construction Vibration Guidance Manual, Caltrans, Sept. 2013. Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Table 6 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 6: Vibration Source Levels for Construction Equipment¹

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level LV (dVB) at 25 feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
¹ Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.		

The nearest building to the site is 60 feet to the west. At a distance of 60 feet, a large bulldozer would yield a worst-case 0.034 PPV (in/sec) which is below any risk of damage. The impact is less than significant, and no mitigation is required.

9.0 References

City of Victorville: General Plan Noise Element.

City of Victorville: Municipal Code - Chapter 13.01 Noise Control.

David Evans and Associates Inc. – Focused Traffic Impact Analysis Report Palmdale Road Medical Offices. April 2024.

FHWA: Highway Traffic Noise Analysis and Abatement Policy and Guidance. 1995.

State of California General Plan Guidelines: 1998. Governor’s Office of Planning and Research

Caltrans: Traffic Census Program. 2022.

FHWA: Construction Noise Handbook. 2006.

Caltrans: Transportation and Construction Vibration Guidance Manual. April 2020.

FTA: Transit Noise and Vibration Impact Assessment. Sept. 2018.

Appendix A:
Field Measurement Data

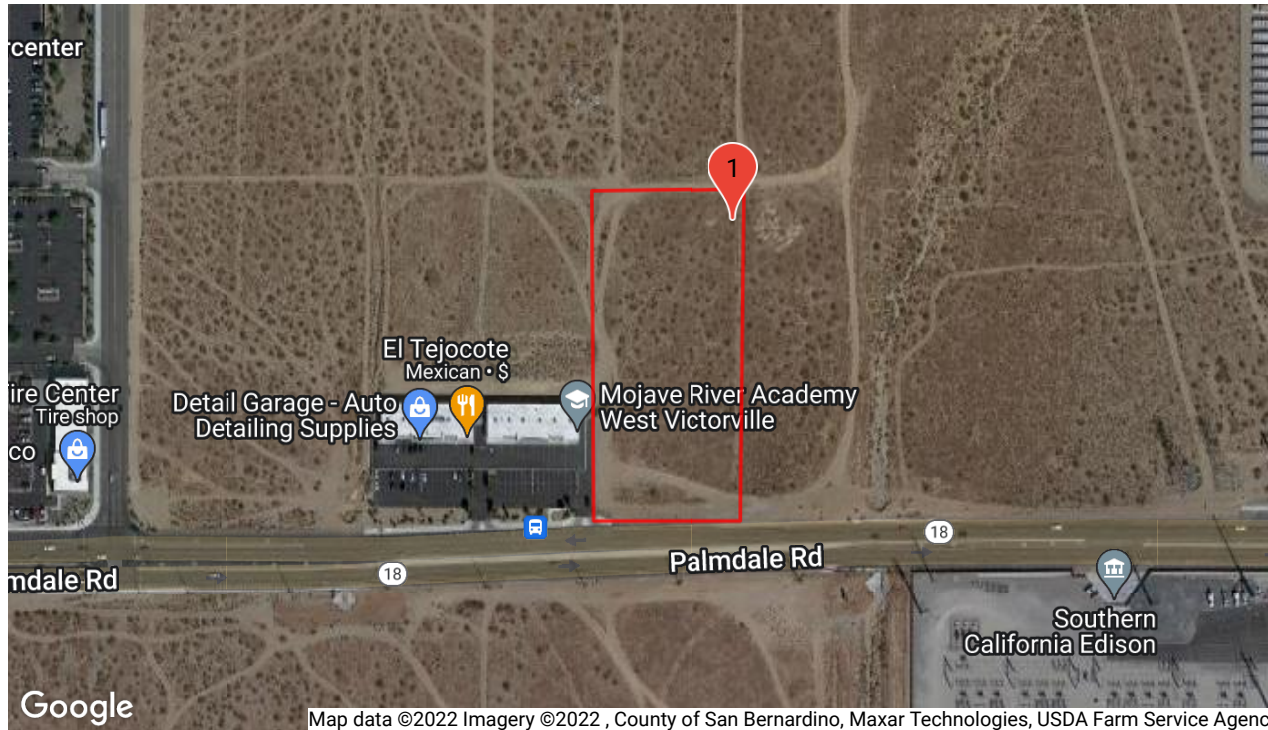
24-Hour Continuous Noise Measurement Datasheet

Project Name: Palmdale Road Noise
Project: #/Name: 0739-2021-019
Site Address / Location: Palmdale Road, Victorville, CA
Date: 02/11/2022
Field Tech / Engineer: Jason Schuyler

Sound Meter: Piccolo 2, Soft dB **SN:** P02QC2019080208
Settings: A-weighted, slow, 1-min, 24-hour duration
Meteorological Cond.: Sunny ,70'sF @ day, 30's @ night -5-7MPH N.W
Site Id: NM1

Site Observations:
Flat open Ground w road noise

Site Topo: flat
Ground Type: soft site open ground
Noise Source(s) w/ Distance:
NM1: 575 ft from SR-18



24-Hour Continuous Noise Measurement Datasheet - Cont.

Project Name: Palmdale Road Noise
Site Address / Location: Palmdale Road, Victorville, CA
Site Id: NM1

Figure 1: NM1 - Looking East



Palmdale Rd Noise

Octave spectra of the sources in dB(A) - 001 - Palmdale: Outdoor SP

3

Name	Source type	I or A m,m²	L'w dB(A)	Lw dB(A)	KI dB	KT dB	DO-Wall dB	Time histogram	Emission spectrum	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)	
Parking	PLot	122.34	54.6	75.5	0.0	0.0	0	2 an Hour	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2	
Parking	PLot	68.10	54.7	73.0	0.0	0.0	0	2 an Hour	Typical spectrum	56.4	68.0	60.5	65.0	65.1	65.5	62.8	56.6	43.8	
Parking	PLot	97.46	54.9	74.8	0.0	0.0	0	2 an Hour	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5	
Parking	PLot	103.14	54.6	74.8	0.0	0.0	0	2 an Hour	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5	

MD Acoustics LLC 4960 S. Gilbert Rd Chandler, AZ 85249 Phone: 602 774 1950

2

24-Hour Continuous Noise Measurement Datasheet - Cont.

Project Name: Palmdale Road Noise
Site Address / Location: Palmdale Road, Victorville, CA
Site Id: NM1

Day: 1 of 1

Table 1: Baseline Noise Measurement Summary

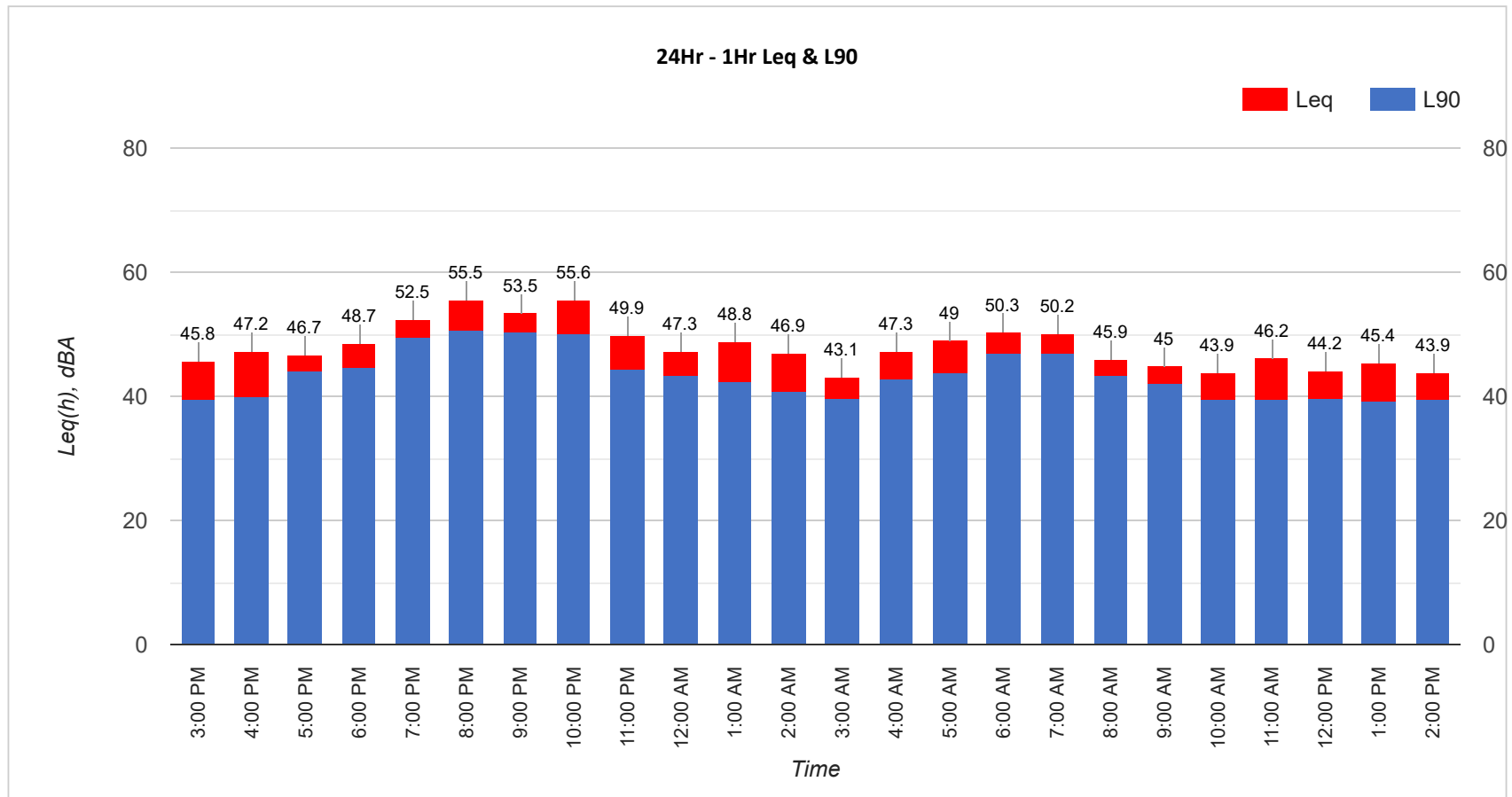
Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
2/11/2022	3:00 PM	4:00 PM	45.8	69.2	34.3	54.2	47.4	43.8	42.1	39.6
2/11/2022	4:00 PM	5:00 PM	47.2	71.9	33.1	57	49.4	45.7	42.9	39.9
2/11/2022	5:00 PM	6:00 PM	46.7	60.7	38.3	50.2	49.1	47.4	46	44.1
2/11/2022	6:00 PM	7:00 PM	48.7	66.9	39.1	53.5	51.2	49.2	47.1	44.7
2/11/2022	7:00 PM	8:00 PM	52.5	67.1	43.4	56.5	55.5	53.2	51.6	49.6
2/11/2022	8:00 PM	9:00 PM	55.5	78.8	43.8	58.6	57.4	55.1	53.3	50.6
2/11/2022	9:00 PM	10:00 PM	53.5	75.8	43.3	57.3	56.1	54.2	51.9	50.4
2/11/2022	10:00 PM	11:00 PM	55.6	81.9	43.9	60.3	55.8	54.3	52.7	50.1
2/11/2022	11:00 PM	12:00 AM	49.9	64.8	38	54.5	53	50.8	48.7	44.5
2/12/2022	12:00 AM	1:00 AM	47.3	62.8	36.9	52.4	50.6	48.2	46.1	43.4
2/12/2022	1:00 AM	2:00 AM	48.8	72.9	37.4	56.3	50.7	47.4	45.2	42.4
2/12/2022	2:00 AM	3:00 AM	46.9	74.2	35.6	52.3	48.6	47	44.2	40.9
2/12/2022	3:00 AM	4:00 AM	43.1	59.9	36.4	47.1	45.9	44.1	42.1	39.7
2/12/2022	4:00 AM	5:00 AM	47.3	66.4	37.7	53.2	50.1	47.8	45.5	42.9
2/12/2022	5:00 AM	6:00 AM	49	67.2	39.2	54.1	51.7	49.9	48.4	44
2/12/2022	6:00 AM	7:00 AM	50.3	61.2	42.3	54.2	53.4	51.4	49.6	47
2/12/2022	7:00 AM	8:00 AM	50.2	71.6	42.2	56.3	51.9	50	48.8	47
2/12/2022	8:00 AM	9:00 AM	45.9	59.9	39.2	50.3	48.3	46	44.9	43.5
2/12/2022	9:00 AM	10:00 AM	45	69.8	38.3	48.8	47.6	45.5	44.1	42.1
2/12/2022	10:00 AM	11:00 AM	43.9	71.9	35.1	49.7	47.6	43.2	41.9	39.5
2/12/2022	11:00 AM	12:00 PM	46.2	67.9	33.9	55.4	49.1	44.6	42	39.4
2/12/2022	12:00 PM	1:00 PM	44.2	63.6	34.7	49.8	47.1	44.7	43.1	39.8
2/12/2022	1:00 PM	2:00 PM	45.4	71.3	33.1	51.7	47.9	45.8	42.2	39.1
2/12/2022	2:00 PM	3:00 PM	43.9	62.6	33.2	48.7	47	44.7	42.4	39.5

	DNL	56.7
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24-Hour Continuous Noise Measurement Datasheet - Cont.

Project Name: Palmdale Road Noise
Site Address / Location: Palmdale Road, Victorville, CA
Site Id: NM1

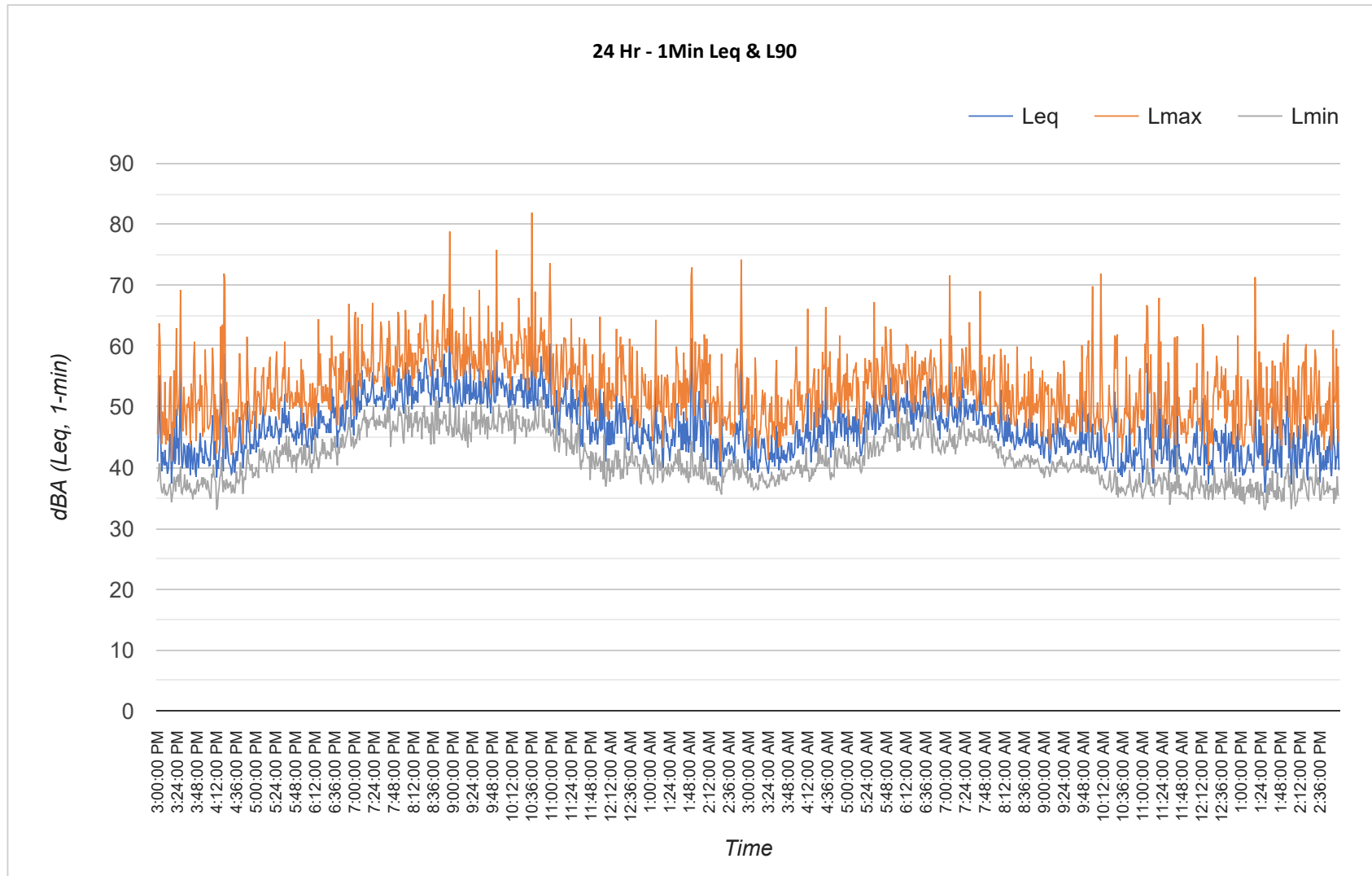
Day: 1 of 1



24-Hour Continuous Noise Measurement Datasheet - Cont.

Project Name: Palmdale Road Noise
Site Address / Location: Palmdale Road, Victorville, CA
Site Id: NM1

Day: 1 of 1



Appendix B:
Referenced Traffic Data

DISTRICT	ROUTE	ROUTE_SFX	COUNTY	PM_PFX	PM	PM_SFX	LOCATION DESCRIPTION	BACK_PEAK_HOUR	BACK_PEAK_MADT	BACK_AADT	AHEAD_PEAK_HOUR	AHEAD_PEAK_MADT	AHEAD_AADT
08	018		SBD		97.001		VICTORVILLE, AMARGOSA ROAD	3800	43000	40000	2850	32500	30000
08	018		SBD		100.956		JCT. RTE. 395	1850	20800	19300	860	9800	9100

Appendix C:

SoundPLAN Input and Output

Project: Sound Library

Job Number: 0000-2020-02

Site Address/Location: Gilbert, AZ

Date: 09/18/2018

Field Tech/Engineer: Robert Pearson

Source/System: Carrier 50TFQ0006 - 5 Ton

General Location: Measured @ 3'

Sound Meter: NTL XL2

SN: A2A-05967-E0

Settings: A-weighted, slow, 1-sec, 10-sec duration

Meteorological Cond.: 90 degrees, 0 mph wind

Ln 2	Ln 8	Ln 25	Ln 50	Ln 90	Ln 99
0.0	0.0	0.0	0.0	0.0	0.0

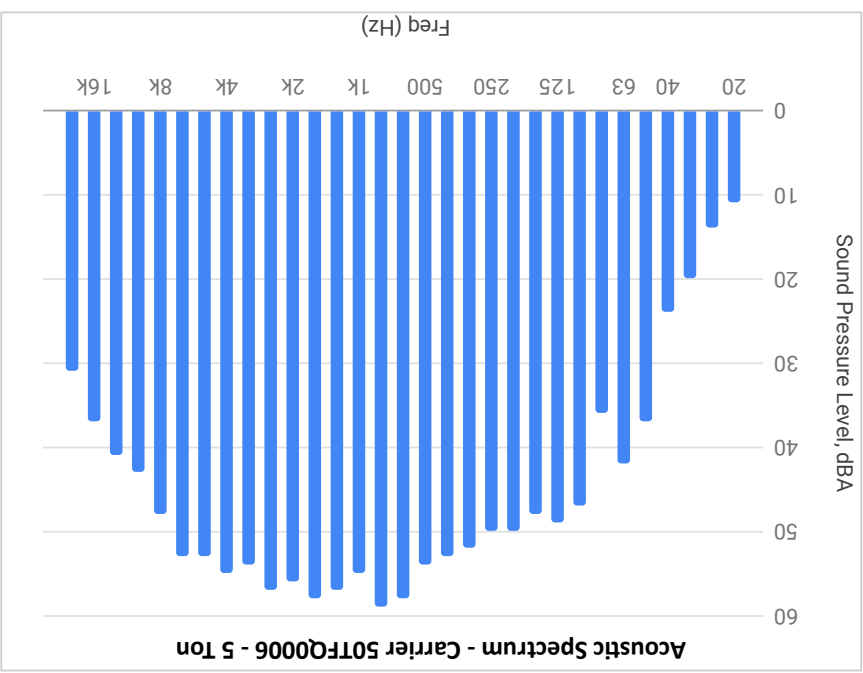
Leg	Lmin	Lmax
67.7	66.9	68.5

Table 1: Summary Measurement Data

Source/System	Overall Source	Overall	3rd Octave Band Data (dBA)															Carrier 50TFQ0006 - 5 Ton
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	
		67.7	11.0	14.0	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	52.0	53.0	54.0	
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	
			16k	12.5	10k	8k	6.3k	5k	4k	3.15	2.5k	2k	1.6k	1.25	1k	800	630	
			31.0	37.0	41.0	43.0	48.0	53.0	53.0	54.0	55.0	57.0	58.0	59.0	58.0	57.0	56.0	
			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	



Figure 1: Commercial Air Conditioner - Carrier 50TFQ0006 - 5 Ton



Site Observations: Clear sky, measurements were performed at 3ft from source.

Project:	Sound Library	Site Observations:	Clear sky, measurements were performed at 3ft of source.										
	Job Number:		0000-2020-02	Parking lot									
	Date:		09/18/2018	Robert Pearson									
	Field Tech/Engineer:		2009 Hyundai Sonata	Measured @ 3'									
	Sound Meter:		NTI XL2	SN: A2A-05967-E0									
	Settings:		A-weighted, slow, 1-sec, 10-sec duration										
	Meteorological Cond.:		90 degrees F, 0 mph wind										

Source/System			Overall Source	Overall	3rd Octave Band Data (dBA)																												
					20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	12.5	1.6k	2k	2.5k	3.15	4k	5k	6.3k	8k	10k	12.5
2009 Hyundai Sonata	Car Idle	58.7	13.0	32.0	15.0	21.0	36.0	37.0	39.0	37.0	41.0	38.0	44.0	39.0	41.0	45.0	45.0	49.0	47.0	47.0	48.0	46.0	49.0	50.0	47.0	45.0	42.0	39.0	37.0	34.0	32.0	30.0	29.0

Table 1: Summary Measurement Data

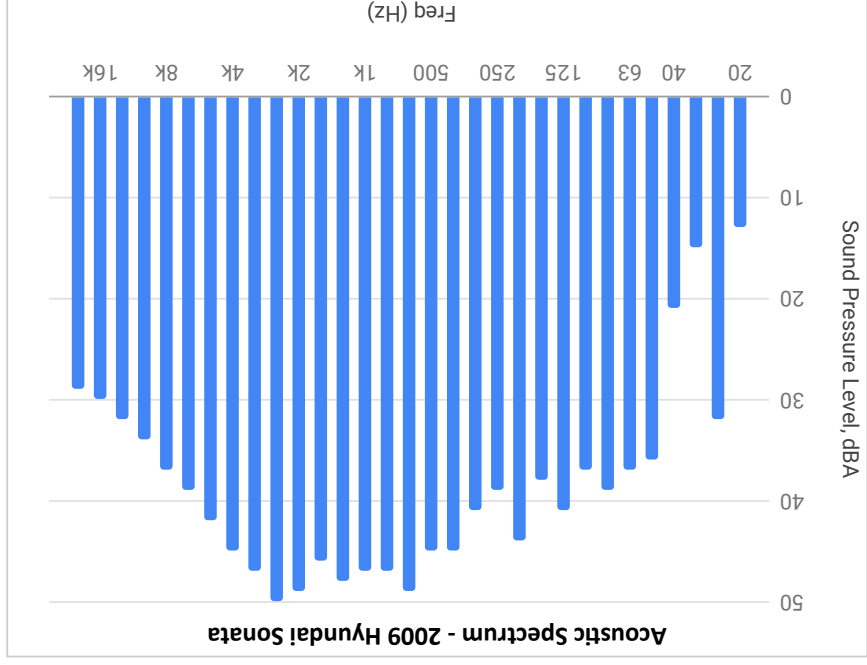


Figure 1: Car Idle - Hyundai Sonata

Project:	Whataburger	Site Observations:
Job Number:	0792-2021-01	3-feet from drive-thru speakerphone
Site Address/Location:	20151 S. Ellsworth Road	
Date:	03/09/2021	
Field Tech/Engineer:	Robert Pearson	
Source/System:	Drive Thru Speaker Phone	
General Location:	3-feet	
Sound Meter:	NTi	SN: A2A-16164-E0
Settings:	A-weighted, Slow, 1-sec, 10-sec duration	
Meteorological Cond.:	Clear Skies, 60 degrees	

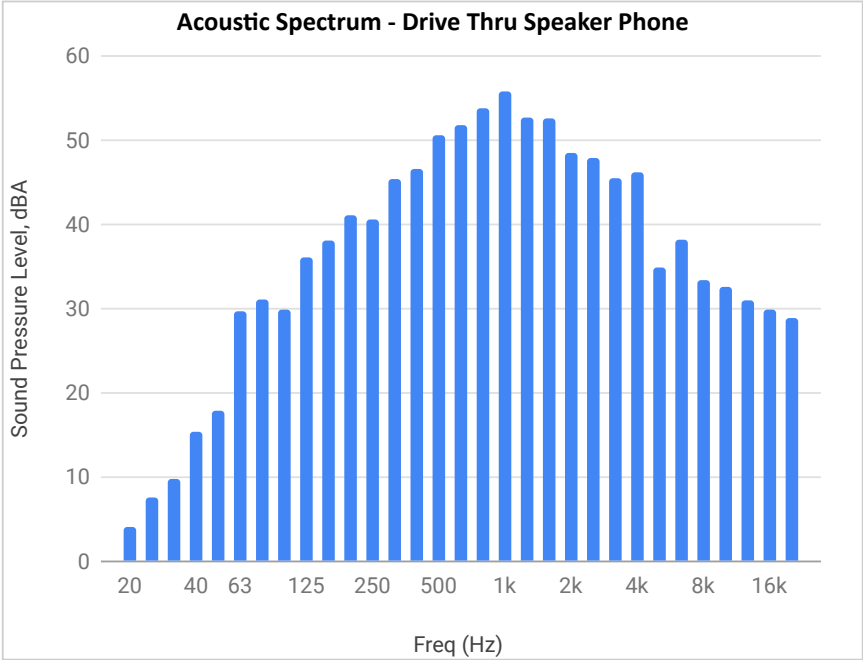
Leq	Lmin	Lmax
62.1	56.5	66.8

Ln 2	Ln 5	Ln 10	Ln 50	Ln 90	Ln 99
0.0	68.0	66.2	58.5	55.7	0.0

Table 1: Summary Measurement Data

Source/System	Overall Source	Overall dB(A)	3rd Octave Band Data (dBA)																														
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	12.5k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
Drive Thru Speaker Phone	Drive Thru Spea	62.1	4.2	7.7	9.9	15.5	18.0	29.8	31.2	30.0	36.2	38.2	41.2	40.7	45.5	46.7	50.7	51.9	53.9	55.9	52.8	52.7	48.6	48.0	45.6	46.3	35.0	38.3	33.5	32.7	31.1	30.0	29.0

Figure 1:



Palmdale Rd Noise

Contribution spectra - 001 - Palmdale: Outdoor SP

Source	Time slice	Sum dB(A)	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)	
Receiver R1 FI G Lr,lim dB(A) Leq,d 56.4 dB(A)												
25	Leq,d	39.5	22.6	24.9	27.7	32.7	33.4	34.4	29.7	17.4	-1.3	
Drive Thru Speaker	Leq,d	31.8	3.7	10.7	17.8	24.9	29.0	24.6	17.6	5.2	-11.9	
HVAC	Leq,d	27.6	5.1	13.8	16.4	21.0	22.5	21.6	16.7	8.5	-15.4	
HVAC	Leq,d	22.2	1.3	9.6	11.8	16.1	17.3	15.8	9.2	-2.0		
HVAC	Leq,d	32.9	9.8	18.6	21.2	26.1	27.9	27.1	22.5	14.9	-6.9	
HVAC	Leq,d	33.1	9.6	18.4	21.0	26.3	28.1	27.3	22.8	15.0	-7.2	
HVAC	Leq,d	27.1	6.5	15.0	17.0	20.8	22.5	20.2	13.5	2.8	-25.0	
HVAC	Leq,d	26.3	6.3	14.8	16.9	20.7	21.2	18.7	12.0	1.9	-25.4	
HVAC	Leq,d	26.9	4.4	13.1	15.7	20.3	21.8	20.9	16.1	7.8	-16.9	
HVAC	Leq,d	20.7	1.7	9.7	11.5	15.1	15.7	13.1	5.9	-5.7		
Parking	Leq,d	18.9	8.0	17.2	7.2	9.1	6.3	3.3	-4.7	-22.5		
Parking	Leq,d	13.2	3.3	11.6	0.9	2.3	-0.7	-1.5	-8.3	-24.2		
Parking	Leq,d	20.5	9.1	18.8	8.7	10.3	7.4	4.6	-4.2	-23.5		
Parking	Leq,d	35.3	18.8	30.4	22.9	27.3	27.9	27.9	23.7	12.6	-13.9	
Parking	Leq,d	39.6	22.8	34.4	27.0	31.8	32.3	32.4	28.6	18.9	-3.3	
Parking	Leq,d	33.9	17.9	29.3	21.7	26.0	26.0	26.0	21.9	11.0	-15.2	
Parking	Leq,d	27.5	11.4	22.9	15.4	19.8	19.8	19.6	14.9	1.4		
Parking	Leq,d	28.3	13.5	24.7	16.6	20.4	19.9	19.3	14.1	-0.5		
Parking	Leq,d	30.6	14.6	26.2	18.6	22.9	22.8	22.5	17.3	2.2		
Parking	Leq,d	19.3	8.7	17.8	7.2	8.6	5.5	2.4	-4.9	-20.6		
Parking	Leq,d	27.0	12.9	23.6	15.1	18.7	18.2	17.8	13.2	0.8	-29.9	
Parking	Leq,d	31.4	15.2	26.8	19.2	23.7	23.6	23.6	19.2	7.0	-23.6	
Parking	Leq,d	41.6	25.0	36.6	29.0	33.9	33.9	34.1	30.7	22.1	2.8	
Parking	Leq,d	37.1	20.1	31.7	24.2	29.7	29.7	29.9	26.3	17.0	-3.9	
Parking	Leq,d	52.1	35.6	47.1	39.6	44.1	44.2	44.6	41.7	35.0	20.7	
Parking	Leq,d	35.1	18.7	30.2	22.9	27.4	27.5	27.5	23.4	12.0	-15.8	
Parking	Leq,d	38.1	20.9	32.5	26.3	30.8	30.8	30.9	27.0	16.5	-8.5	
Parking	Leq,d	34.7	18.6	30.0	22.3	27.1	26.9	26.9	22.8	11.7	-14.9	
Parking	Leq,d	39.8	22.0	34.4	27.5	32.0	32.4	32.5	28.8	19.1	-3.2	
Parking	Leq,d	41.2	24.6	36.2	28.6	33.5	33.5	33.7	30.3	21.8	2.6	
Parking	Leq,d	37.4	20.9	32.5	25.0	29.4	29.9	30.0	26.1	16.0	-7.6	
Parking	Leq,d	41.6	24.9	36.5	29.1	33.8	33.9	34.1	30.9	22.7	4.6	
Parking	Leq,d	39.8	22.0	34.5	27.6	32.2	32.4	32.5	28.8	19.2	-3.1	
Parking	Leq,d	51.9	35.3	46.9	39.4	43.9	44.0	44.3	41.5	34.7	20.4	
Receiver R2 FI G Lr,lim dB(A) Leq,d 48.2 dB(A)												
25	Leq,d	32.4	16.3	18.6	21.2	26.1	26.6	26.9	21.3	5.5	-23.7	
Drive Thru Speaker	Leq,d	25.3	-2.6	4.4	11.4	18.6	22.5	17.8	9.5	-6.8		
HVAC	Leq,d	20.7	-1.8	7.0	9.5	14.2	15.7	14.7	8.9	-2.2		
HVAC	Leq,d	18.0	-3.3	5.0	7.3	11.8	13.1	11.7	4.8	-8.6		
HVAC	Leq,d	32.2	9.4	18.2	20.8	25.5	27.0	26.4	22.0	14.5	-7.5	
HVAC	Leq,d	26.8	5.6	13.9	16.1	20.5	21.8	20.6	15.1	5.2	-24.4	
HVAC	Leq,d	30.7	8.1	16.8	19.4	24.0	25.6	24.8	20.2	12.2	-11.4	
HVAC	Leq,d	23.9	5.0	13.1	14.8	18.4	18.8	16.1	8.8	-2.6		
HVAC	Leq,d	23.0	-1.5	7.2	9.8	16.0	18.4	17.7	12.0	0.9		
HVAC	Leq,d	19.8	-3.4	5.0	7.4	11.8	15.8	14.4	7.7	-5.5		
Parking	Leq,d	20.3	6.6	16.6	7.8	11.3	10.7	13.2	6.1	-15.7		
Parking	Leq,d	13.3	1.7	10.2	0.0	2.0	5.5	4.5	-2.3	-23.2		
Parking	Leq,d	26.0	10.4	21.9	14.3	18.6	18.3	17.6	10.6	-10.8		
Parking	Leq,d	41.2	24.8	36.3	28.8	33.3	33.4	33.6	30.2	21.7	1.9	
Parking	Leq,d	38.5	22.1	33.7	26.2	30.6	30.7	30.8	27.2	17.5	-5.5	
Parking	Leq,d	38.3	20.7	33.2	26.3	30.8	30.8	30.9	27.1	16.8	-7.7	
Parking	Leq,d	22.2	7.2	18.5	10.5	14.5	14.1	13.4	7.1	-11.1		

Palmdale Rd Noise

Contribution spectra - 001 - Palmdale: Outdoor SP

Source	Time slice	Sum dB(A)	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)	
Parking	Leq,d	27.4	11.8	23.3	15.6	19.8	19.6	18.9	12.5	-7.2		
Parking	Leq,d	22.0	9.5	19.9	10.8	13.2	10.8	7.8	-1.4	-24.0		
Parking	Leq,d	27.2	11.0	22.6	15.0	19.4	19.2	20.2	14.5	-5.1		
Parking	Leq,d	29.1	12.2	23.7	16.1	20.5	22.6	22.5	16.7	-1.0		
Parking	Leq,d	24.7	9.9	20.9	12.8	16.8	16.5	16.0	10.3	-6.2		
Parking	Leq,d	31.2	14.2	25.8	18.2	24.2	24.1	23.8	18.5	3.4		
Parking	Leq,d	27.8	10.9	22.5	14.9	20.7	20.7	20.5	15.3	0.6		
Parking	Leq,d	31.6	15.1	26.6	19.1	23.5	24.4	24.2	19.4	6.1	-26.4	
Parking	Leq,d	28.1	12.4	23.5	15.5	19.7	21.0	20.7	15.5	0.0		
Parking	Leq,d	31.5	14.1	25.7	20.0	24.4	24.6	24.3	18.9	2.9		
Parking	Leq,d	22.8	9.1	19.1	10.3	14.7	14.3	13.9	9.0	-5.3		
Parking	Leq,d	34.5	18.2	29.8	22.3	26.7	26.7	26.8	22.8	12.0	-14.2	
Parking	Leq,d	36.0	19.6	31.2	23.7	28.1	28.4	28.5	24.6	14.3	-10.0	
Parking	Leq,d	40.7	24.3	35.9	28.4	32.8	32.9	33.1	29.7	21.0	0.9	
Parking	Leq,d	30.8	14.2	25.8	18.3	22.7	23.6	23.5	18.8	6.1	-24.5	
Parking	Leq,d	32.1	15.5	27.1	19.5	24.7	24.7	24.6	20.2	7.5	-24.0	
Parking	Leq,d	33.5	17.1	28.7	21.1	25.6	26.1	26.0	21.7	10.0	-18.3	
Receiver R3 FI G Lr,lim dB(A) Leq,d 54.6 dB(A)												
25	Leq,d	41.9	23.8	26.1	30.2	35.2	35.7	36.7	32.4	21.4	6.9	
Drive Thru Speaker	Leq,d	32.8	0.1	9.5	18.8	26.0	30.0	25.6	18.4	5.4	-13.6	
HVAC	Leq,d	28.2	5.2	13.3	17.5	21.9	23.2	22.2	17.2	7.9	-18.7	
HVAC	Leq,d	24.2	2.7	11.3	14.5	18.4	19.3	17.2	10.4	-0.8		
HVAC	Leq,d	20.0	5.0	11.9	12.2	14.1	13.5	10.7	6.5	-0.9	-22.9	
HVAC	Leq,d	36.1	17.0	24.3	26.2	30.1	31.0	29.1	23.6	16.0	-3.6	
HVAC	Leq,d	29.6	10.5	18.6	20.4	24.0	24.4	21.9	15.5	6.5	-17.0	
HVAC	Leq,d	42.9	23.5	31.9	33.8	37.3	37.6	35.2	29.5	22.4	5.9	
HVAC	Leq,d	30.6	6.4	15.8	19.6	24.2	25.6	24.6	19.6	11.5	-11.8	
HVAC	Leq,d	27.1	3.6	13.2	15.9	20.4	22.2	21.3	15.8	6.2	-22.2	
Parking	Leq,d	29.8	13.8	25.5	17.9	22.0	21.8	21.6	16.5	1.7		
Parking	Leq,d	25.9	10.2	22.0	14.0	18.0	17.7	17.5	12.6	-1.1		
Parking	Leq,d	32.6	15.2	26.8	19.2	25.7	25.8	25.5	20.5	6.0		
Parking	Leq,d	17.5	7.5	15.8	5.2	6.6	3.6	1.9	-3.4	-16.3		
Parking	Leq,d	18.2	8.3	16.6	5.8	7.2	4.3	2.9	-2.1	-14.3		
Parking	Leq,d	20.2	9.9	18.5	8.1	9.6	7.0	5.4	0.1	-11.6		
Parking	Leq,d	33.7	16.4	28.0	20.4	26.6	26.6	26.6	22.6	11.8	-13.7	
Parking	Leq,d	35.8	18.5	30.1	22.5	28.7	28.7	28.6	24.3	12.1	-17.2	
Parking	Leq,d	36.1	18.7	30.3	22.8	29.1	29.0	29.0	24.6	12.5	-16.4	
Parking	Leq,d	35.3	16.5	29.4	23.7	28.2	28.2	28.1	23.6	10.8	-20.8	
Parking	Leq,d	38.5	19.2	32.2	26.8	31.3	31.4	31.7	27.6	16.4	-10.4	
Parking	Leq,d	39.0	21.6	34.2	26.7	31.2	31.2	31.4	28.0	18.6	-3.0	
Parking	Leq,d	34.9	17.7	29.3	21.8	27.8	27.8	27.8	23.5	11.8	-17.1	
Parking	Leq,d	33.2	16.3	27.9	21.2	25.7	25.7	25.8	22.0	11.6	-13.4	
Parking	Leq,d	29.2	14.5	25.5	17.3	21.2	20.8	20.4	16.0	4.1	-24.9	
Parking	Leq,d	43.8	26.1	38.7	31.6	36.1	36.1	36.4	33.0	24.5	5.2	
Parking	Leq,d	38.7	20.6	32.2	27.3	31.7	31.7	31.8	27.9	17.3	-7.8	
Parking	Leq,d	52.4	35.3	47.4	40.0	44.5	44.5	44.9	42.0	35.0	20.3	
Parking	Leq,d	18.8	9.1	17.1	6.2	7.5	4.8	4.0	-0.5	-11.2		
Parking	Leq,d	17.0	7.0	15.4	4.6	5.9	2.9	0.3	-5.3	-19.2		
Parking	Leq,d	16.3	6.4	14.7	3.9	5.3	2.3	0.4	-5.0	-18.7		
Parking	Leq,d	21.8	11.1	20.2	9.7	11.2	8.3	5.7	-0.1	-12.1		
Parking	Leq,d	25.2	14.4	23.4	13.1	14.8	12.1	10.1	4.8	-5.8	-28.8	
Parking	Leq,d	20.2	9.8	18.7	8.0	9.4	6.4	3.5	-2.5	-16.0		
Receiver R4 FI G Lr,lim dB(A) Leq,d 46.0 dB(A)												

Palmdale Rd Noise

Contribution spectra - 001 - Palmdale: Outdoor SP

Source	Time slice	Sum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz	
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
25	Leq,d	33.0	17.5	19.0	21.6	26.5	26.9	27.5	22.5	9.2	-11.2	
Drive Thru Speaker	Leq,d	1.6	-15.8	-12.3	-8.3	-4.2	-2.0	-7.5	-16.0			
HVAC	Leq,d	20.4	0.6	8.9	10.9	14.8	15.5	13.1	5.9	-5.9		
HVAC	Leq,d	26.5	4.1	12.7	15.2	19.9	21.4	20.6	15.8	7.5	-17.5	
HVAC	Leq,d	21.8	-0.4	7.9	10.1	14.5	16.9	16.7	9.6	-4.6		
HVAC	Leq,d	23.0	0.6	9.4	12.0	16.6	18.1	17.1	11.1	-0.4		
HVAC	Leq,d	20.7	-1.1	7.4	9.8	14.2	15.6	15.1	7.8	-6.6		
HVAC	Leq,d	22.8	0.4	9.2	11.8	16.4	17.9	16.8	10.8	-0.9		
HVAC	Leq,d	22.9	1.4	9.5	11.7	16.1	17.4	17.6	11.7	0.9		
HVAC	Leq,d	27.3	4.9	13.5	16.0	20.5	22.1	21.5	16.8	8.5	-15.8	
Parking	Leq,d	39.1	22.3	33.9	26.4	31.5	31.5	31.6	27.9	18.1	-4.8	
Parking	Leq,d	35.8	17.8	31.1	23.6	28.1	28.1	28.1	24.1	13.1	-13.5	
Parking	Leq,d	38.7	22.3	33.9	26.4	30.8	30.9	31.0	27.4	17.8	-4.8	
Parking	Leq,d	24.3	8.7	20.0	12.2	16.3	16.0	17.1	10.1	-13.1		
Parking	Leq,d	25.9	9.9	21.2	13.3	17.4	19.4	18.6	11.5	-10.9		
Parking	Leq,d	16.9	3.0	12.5	3.3	6.4	10.6	9.8	2.1	-21.3		
Parking	Leq,d	28.0	11.6	23.1	15.6	20.0	20.7	20.5	15.6	1.9		
Parking	Leq,d	35.0	18.7	30.3	22.7	27.2	27.4	27.4	23.1	11.4	-16.8	
Parking	Leq,d	34.8	18.4	30.0	22.4	26.9	27.3	27.2	22.8	10.9	-17.9	
Parking	Leq,d	34.3	18.1	29.7	22.1	26.6	26.6	26.6	22.5	11.3	-16.2	
Parking	Leq,d	31.4	15.3	26.8	19.3	23.7	23.7	23.6	18.9	5.6	-27.8	
Parking	Leq,d	29.0	12.6	24.2	16.6	21.0	21.8	21.5	16.3	1.1		
Parking	Leq,d	23.0	6.6	15.5	5.1	6.6	18.6	18.1	11.9	-6.5		
Parking	Leq,d	18.9	3.7	12.8	2.6	4.3	14.0	13.4	7.0	-12.4		
Parking	Leq,d	17.0	5.8	14.9	4.7	6.3	4.9	6.4	-2.1	-24.4		
Parking	Leq,d	30.5	13.9	25.5	17.9	23.3	23.2	22.9	17.4	1.2		
Parking	Leq,d	22.5	8.8	19.0	10.4	14.1	14.2	13.6	8.1	-8.0		
Parking	Leq,d	31.3	13.6	26.4	19.7	24.1	24.0	23.6	17.8	0.4		
Parking	Leq,d	26.9	10.1	21.7	14.1	18.4	20.6	20.0	13.1	-7.9		
Parking	Leq,d	16.8	5.4	15.0	5.1	6.9	4.0	3.0	-7.8			
Parking	Leq,d	21.3	7.3	18.0	9.3	12.6	11.3	13.3	5.3	-19.3		
Parking	Leq,d	20.8	5.6	15.5	6.0	8.1	15.5	14.7	7.8	-13.3		
Parking	Leq,d	27.1	11.0	22.6	15.0	19.4	19.9	19.4	13.2	-5.5		
Parking	Leq,d	16.9	5.7	15.2	5.1	6.9	3.9	2.1	-7.9			

Palmdale Rd Noise **Contribution level - 001 - Palmdale: Outdoor SP**

9

Source	Source group	Source type	Leq,d dB(A)	
Receiver R1 FI G Lr,lim dB(A) Leq,d 56.4 dB(A)				
Parking	Default parking lot noise	PLot	52.1	
Parking	Default parking lot noise	PLot	51.9	
Parking	Default parking lot noise	PLot	41.6	
Parking	Default parking lot noise	PLot	41.6	
Parking	Default parking lot noise	PLot	41.2	
Parking	Default parking lot noise	PLot	39.8	
Parking	Default parking lot noise	PLot	39.8	
Parking	Default parking lot noise	PLot	39.6	
25	Default industrial noise	Line	39.5	
Parking	Default parking lot noise	PLot	38.1	
Parking	Default parking lot noise	PLot	37.4	
Parking	Default parking lot noise	PLot	37.1	
Parking	Default parking lot noise	PLot	35.3	
Parking	Default parking lot noise	PLot	35.1	
Parking	Default parking lot noise	PLot	34.7	
Parking	Default parking lot noise	PLot	33.9	
HVAC	Default industrial noise	Point	33.1	
HVAC	Default industrial noise	Point	32.9	
Drive Thru Speaker	Default industrial noise	Point	31.8	
Parking	Default parking lot noise	PLot	31.4	
Parking	Default parking lot noise	PLot	30.6	
Parking	Default parking lot noise	PLot	28.3	
HVAC	Default industrial noise	Point	27.6	
Parking	Default parking lot noise	PLot	27.5	
HVAC	Default industrial noise	Point	27.1	
Parking	Default parking lot noise	PLot	27.0	
HVAC	Default industrial noise	Point	26.9	
HVAC	Default industrial noise	Point	26.3	
HVAC	Default industrial noise	Point	22.2	
HVAC	Default industrial noise	Point	20.7	
Parking	Default parking lot noise	PLot	20.5	
Parking	Default parking lot noise	PLot	19.3	
Parking	Default parking lot noise	PLot	18.9	
Parking	Default parking lot noise	PLot	13.2	
Receiver R2 FI G Lr,lim dB(A) Leq,d 48.2 dB(A)				
Parking	Default parking lot noise	PLot	41.2	
Parking	Default parking lot noise	PLot	40.7	
Parking	Default parking lot noise	PLot	38.5	
Parking	Default parking lot noise	PLot	38.3	
Parking	Default parking lot noise	PLot	36.0	
Parking	Default parking lot noise	PLot	34.5	
Parking	Default parking lot noise	PLot	33.5	
25	Default industrial noise	Line	32.4	

Palmdale Rd Noise
Contribution level - 001 - Palmdale: Outdoor SP

9

Source	Source group	Source type	Leq,d dB(A)	
HVAC	Default industrial noise	Point	32.2	
Parking	Default parking lot noise	PLot	32.1	
Parking	Default parking lot noise	PLot	31.6	
Parking	Default parking lot noise	PLot	31.5	
Parking	Default parking lot noise	PLot	31.2	
Parking	Default parking lot noise	PLot	30.8	
HVAC	Default industrial noise	Point	30.7	
Parking	Default parking lot noise	PLot	29.1	
Parking	Default parking lot noise	PLot	28.1	
Parking	Default parking lot noise	PLot	27.8	
Parking	Default parking lot noise	PLot	27.4	
Parking	Default parking lot noise	PLot	27.2	
HVAC	Default industrial noise	Point	26.8	
Parking	Default parking lot noise	PLot	26.0	
Drive Thru Speaker	Default industrial noise	Point	25.3	
Parking	Default parking lot noise	PLot	24.7	
HVAC	Default industrial noise	Point	23.9	
HVAC	Default industrial noise	Point	23.0	
Parking	Default parking lot noise	PLot	22.8	
Parking	Default parking lot noise	PLot	22.2	
Parking	Default parking lot noise	PLot	22.0	
HVAC	Default industrial noise	Point	20.7	
Parking	Default parking lot noise	PLot	20.3	
HVAC	Default industrial noise	Point	19.8	
HVAC	Default industrial noise	Point	18.0	
Parking	Default parking lot noise	PLot	13.3	
Receiver R3 FI G Lr,lim dB(A) Leq,d 54.6 dB(A)				
Parking	Default parking lot noise	PLot	52.4	
Parking	Default parking lot noise	PLot	43.8	
HVAC	Default industrial noise	Point	42.9	
25	Default industrial noise	Line	41.9	
Parking	Default parking lot noise	PLot	39.0	
Parking	Default parking lot noise	PLot	38.7	
Parking	Default parking lot noise	PLot	38.5	
HVAC	Default industrial noise	Point	36.1	
Parking	Default parking lot noise	PLot	36.1	
Parking	Default parking lot noise	PLot	35.8	
Parking	Default parking lot noise	PLot	35.3	
Parking	Default parking lot noise	PLot	34.9	
Parking	Default parking lot noise	PLot	33.7	
Parking	Default parking lot noise	PLot	33.2	
Drive Thru Speaker	Default industrial noise	Point	32.8	
Parking	Default parking lot noise	PLot	32.6	
HVAC	Default industrial noise	Point	30.6	
Parking	Default parking lot noise	PLot	29.8	

Palmdale Rd Noise
Contribution level - 001 - Palmdale: Outdoor SP

9

Source	Source group	Source type	Leq,d dB(A)	
HVAC	Default industrial noise	Point	29.6	
Parking	Default parking lot noise	PLot	29.3	
HVAC	Default industrial noise	Point	28.2	
HVAC	Default industrial noise	Point	27.1	
Parking	Default parking lot noise	PLot	25.9	
Parking	Default parking lot noise	PLot	25.2	
HVAC	Default industrial noise	Point	24.2	
Parking	Default parking lot noise	PLot	21.8	
Parking	Default parking lot noise	PLot	20.2	
Parking	Default parking lot noise	PLot	20.2	
HVAC	Default industrial noise	Point	20.0	
Parking	Default parking lot noise	PLot	18.8	
Parking	Default parking lot noise	PLot	18.2	
Parking	Default parking lot noise	PLot	17.5	
Parking	Default parking lot noise	PLot	17.0	
Parking	Default parking lot noise	PLot	16.3	
Receiver R4 FI G Lr,lim dB(A) Leq,d 46.0 dB(A)				
Parking	Default parking lot noise	PLot	39.1	
Parking	Default parking lot noise	PLot	38.7	
Parking	Default parking lot noise	PLot	35.8	
Parking	Default parking lot noise	PLot	35.0	
Parking	Default parking lot noise	PLot	34.8	
Parking	Default parking lot noise	PLot	34.3	
25	Default industrial noise	Line	33.0	
Parking	Default parking lot noise	PLot	31.4	
Parking	Default parking lot noise	PLot	31.3	
Parking	Default parking lot noise	PLot	30.5	
Parking	Default parking lot noise	PLot	29.0	
Parking	Default parking lot noise	PLot	28.0	
HVAC	Default industrial noise	Point	27.3	
Parking	Default parking lot noise	PLot	27.1	
Parking	Default parking lot noise	PLot	26.9	
HVAC	Default industrial noise	Point	26.5	
Parking	Default parking lot noise	PLot	25.9	
Parking	Default parking lot noise	PLot	24.3	
HVAC	Default industrial noise	Point	23.0	
Parking	Default parking lot noise	PLot	23.0	
HVAC	Default industrial noise	Point	22.9	
HVAC	Default industrial noise	Point	22.8	
Parking	Default parking lot noise	PLot	22.5	
HVAC	Default industrial noise	Point	21.8	
Parking	Default parking lot noise	PLot	21.3	
Parking	Default parking lot noise	PLot	20.8	
HVAC	Default industrial noise	Point	20.7	
HVAC	Default industrial noise	Point	20.4	

Palmdale Rd Noise
Contribution level - 001 - Palmdale: Outdoor SP

9

Source	Source group	Source type	Leq,d dB(A)	
Parking	Default parking lot noise	PLot	18.9	
Parking	Default parking lot noise	PLot	17.0	
Parking	Default parking lot noise	PLot	16.9	
Parking	Default parking lot noise	PLot	16.9	
Parking	Default parking lot noise	PLot	16.8	
Drive Thru Speaker	Default industrial noise	Point	1.6	

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	MD Acoustics LLC 4960 S. Gilbert Rd Chandler, AZ 85249 Phone: 602 774 1950	4
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Palmdale Rd Noise

Octave spectra of the sources in dB(A) - 001 - Palmdale: Outdoor SP

3

Name	Source type	l or A m,m²	L'w dB(A)	Lw dB(A)	KI dB	KT dB	DO-Wall dB	Time histogram	Emission spectrum	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)	
	Line	105.86	62.8	83.0	0.0	0.0	0	100%/24h	Drive-Thru - Idling Car @ 3ft	66.7	68.2	71.0	76.0	76.5	77.8	74.3	66.3	59.7	
Drive Thru Speaker	Point		72.3	72.3	0.0	0.0	0	100%/24h	Drive Thru - Speaker	43.9	50.9	58.0	65.2	69.3	65.3	59.3	50.5	45.1	
HVAC	Point		76.5	76.5	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	52.8	61.6	64.4	69.2	70.9	70.7	67.7	63.3	51.6	
HVAC	Point		76.5	76.5	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	52.8	61.6	64.4	69.2	70.9	70.7	67.7	63.3	51.6	
HVAC	Point		79.6	79.6	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	55.9	64.7	67.5	72.3	74.0	73.8	70.8	66.4	54.7	
HVAC	Point		79.6	79.6	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	55.9	64.7	67.5	72.3	74.0	73.8	70.8	66.4	54.7	
HVAC	Point		79.6	79.6	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	55.9	64.7	67.5	72.3	74.0	73.8	70.8	66.4	54.7	
HVAC	Point		79.6	79.6	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	55.9	64.7	67.5	72.3	74.0	73.8	70.8	66.4	54.7	
HVAC	Point		76.5	76.5	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	52.8	61.6	64.4	69.2	70.9	70.7	67.7	63.3	51.6	
HVAC	Point		76.5	76.5	0.0	0.0	0	100%/24h	HVAC @ 3ft - Carrier 50TFQ0006 - 5 Ton	52.8	61.6	64.4	69.2	70.9	70.7	67.7	63.3	51.6	
Parking	PLot	139.49	54.6	76.0	0.0	0.0	0	2 an Hour	Typical spectrum	59.4	71.0	63.5	68.0	68.1	68.5	65.8	59.6	46.8	
Parking	PLot	100.43	54.0	74.0	0.0	0.0	0	2 an Hour	Typical spectrum	57.3	68.9	61.4	65.9	66.0	66.4	63.7	57.5	44.7	
Parking	PLot	135.17	54.7	76.0	0.0	0.0	0	2 an Hour	Typical spectrum	59.4	71.0	63.5	68.0	68.1	68.5	65.8	59.6	46.8	
Parking	PLot	120.86	54.6	75.5	0.0	0.0	0	2 an Hour	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2	
Parking	PLot	130.74	54.9	76.0	0.0	0.0	0	2 an Hour	Typical spectrum	59.4	71.0	63.5	68.0	68.1	68.5	65.8	59.6	46.8	
Parking	PLot	132.43	54.2	75.5	0.0	0.0	0	2 an Hour	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2	
Parking	PLot	49.38	54.8	71.8	0.0	0.0	0	2 an Hour	Typical spectrum	55.1	66.7	59.2	63.7	63.8	64.2	61.5	55.3	42.5	
Parking	PLot	151.15	54.7	76.5	0.0	0.0	0	2 an Hour	Typical spectrum	59.9	71.5	64.0	68.5	68.6	69.0	66.3	60.1	47.3	
Parking	PLot	155.96	54.6	76.5	0.0	0.0	0	2 an Hour	Typical spectrum	59.9	71.5	64.0	68.5	68.6	69.0	66.3	60.1	47.3	
Parking	PLot	130.99	54.3	75.5	0.0	0.0	0	2 an Hour	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2	
Parking	PLot	135.51	54.1	75.5	0.0	0.0	0	2 an Hour	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2	
Parking	PLot	101.47	53.9	74.0	0.0	0.0	0	2 an Hour	Typical spectrum	57.3	68.9	61.4	65.9	66.0	66.4	63.7	57.5	44.7	
Parking	PLot	112.04	55.0	75.5	0.0	0.0	0	2 an Hour	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2	
Parking	PLot	52.64	54.6	71.8	0.0	0.0	0	2 an Hour	Typical spectrum	55.1	66.7	59.2	63.7	63.8	64.2	61.5	55.3	42.5	
Parking	PLot	103.01	54.7	74.8	0.0	0.0	0	2 an Hour	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5	
Parking	PLot	137.69	54.6	76.0	0.0	0.0	0	2 an Hour	Typical spectrum	59.4	71.0	63.5	68.0	68.1	68.5	65.8	59.6	46.8	
Parking	PLot	140.97	54.5	76.0	0.0	0.0	0	2 an Hour	Typical spectrum	59.4	71.0	63.5	68.0	68.1	68.5	65.8	59.6	46.8	
Parking	PLot	147.42	54.9	76.5	0.0	0.0	0	2 an Hour	Typical spectrum	59.9	71.5	64.0	68.5	68.6	69.0	66.3	60.1	47.3	
Parking	PLot	119.22	54.0	74.8	0.0	0.0	0	2 an Hour	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5	
Parking	PLot	100.05	54.8	74.8	0.0	0.0	0	2 an Hour	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5	

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1

Appendix D:
Construction Modeling Output

Receptor - Residences to the East

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA ¹	Edge of Site to Receptor, feet	Center of Site to Receptor, feet	Item Usage Percent ¹	Ground Factor ²	Usage Factor	Receptor Item Lmax, dBA	Recptor. Item Leq, dBA
SITE PREP									
Dozer	3	82	60	172	40	0.66	0.40	79.9	63.7
Tractor	4	84	60	172	40	0.66	0.40	81.9	65.7
							Log Sum	81.9	73.5
GRADE									
Excavator	1	81	60	172	40	0.66	0.40	78.9	62.7
Grader	1	85	60	172	40	0.66	0.40	82.9	66.7
Dozer	1	82	60	172	40	0.66	0.40	79.9	63.7
Tractor	3	84	60	172	40	0.66	0.40	81.9	65.7
								82.9	73.1
BUILD									
Crane	1	81	60	172	16	0.66	0.16	78.9	58.8
Man lift	3	75	60	172	20	0.66	0.20	72.9	53.7
Generator	1	81	60	172	50	0.66	0.50	78.9	63.7
Tractor	3	84	60	172	40	0.66	0.40	81.9	65.7
Welder/Torch	1	74	60	172	40	0.66	0.40	71.9	55.7
								81.9	71.9
PAVE									
Concrete mixer truck	2	79	60	172	40	0.66	0.40	76.9	60.7
Paver	1	77	60	172	50	0.66	0.50	74.9	59.7
Roller	2	80	60	172	20	0.66	0.20	77.9	58.7
Tractor	1	84	60	172	40	0.66	0.40	81.9	65.7
								81.9	69.3
ARCH COAT									
Compressor (air)	1	78	60	172	40	0.66	0.40	75.9	59.7
								75.9	59.7

¹FHWA Construction Noise Handbook: Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

VIBRATION LEVEL IMPACT

Project: Chula Vista Self Storage

Date: 3/30/22

Source: Large Bulldozer

Scenario: Unmitigated

Location: Project Site

Address:

PPV = $PPV_{ref}(25/D)^n$ (in/sec)

DATA INPUT

Equipment = 2 Large Bulldozer INPUT SECTION IN BLUE
Type

PPVref = 0.089 Reference PPV (in/sec) at 25 ft.

D = 60.00 Distance from Equipment to Receiver (ft)

n = 1.10 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

DATA OUT RESULTS

PPV = 0.034 IN/SEC OUTPUT IN RED