Motte Country Plaza
Noise Impact Study
City of Menifee, CA

Prepared for:

Mr. Mike Naggar & Associates, Inc
445 S. D St
Perris, CA 92570

Prepared by:

MD Acoustics, LLC
Mike Dickerson, INCE & Robert Pearson
1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065

Date: 1/19/2021

MD ACOUSTICS
Sound Solutions for Planning and Design

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

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 located in the northwest corner of Palomar Road and State Highway 74, in the City of Menifee, California, as shown in Exhibit A. The site is currently zoned as Commercial. Land uses surrounding the site include proposed residential to the north, existing residential to the west, Commercial/Business park to the east and south.

1.3 Proposed Project Description

The Project proposes relocating existing train car restaurant buildings within the same existing commercial center and constructing a 16-pump gasoline station with 3,600 square foot (SF) convenience store and 1,750 SF fast food restaurant with drive thru and a 1,050 SF automated car wash on the 1.43-acre site. It should be noted that the Automated car wash will only be operational during daytime hours.

This study assesses both the traffic and stationary noise to and from the project site and compares the results to the applicable City noise limits. The primary source of traffic noise propagates from Palomar Road and State Highway 74. The primary source of stationary noise propagates from the on-site car wash blow dryer system, vacuums, drive thru speakerphones and convenience store operations. The site plan used for this is illustrated in Exhibit B.

Construction activities within the Project area will consist of on-site grading, building, paving, and architectural coating.

Exhibit A

Location Map

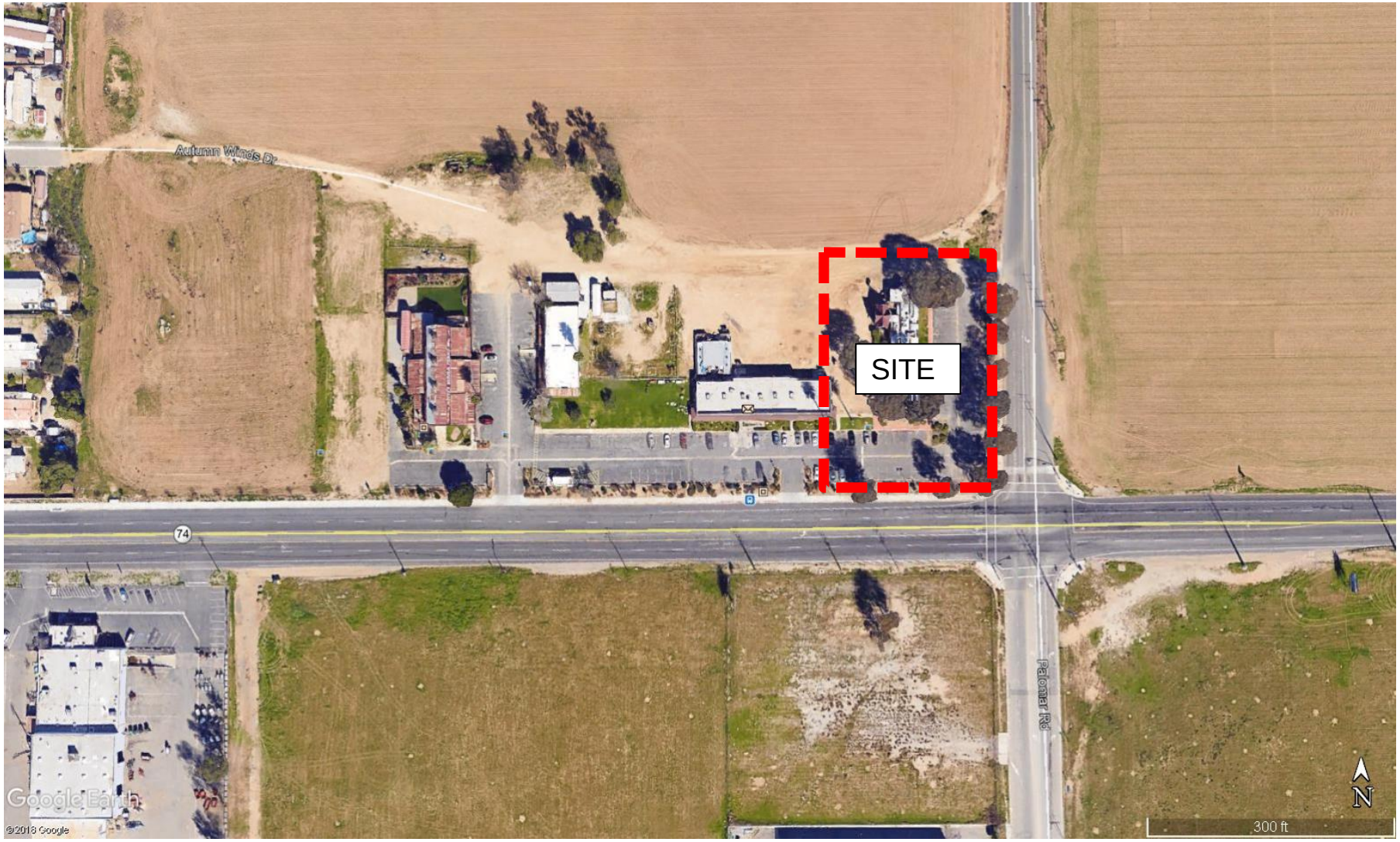


Exhibit B

Site Plan

Parking Study - Existing Site and Train

	Area			Spaces Required
Train Restaurant :				
Restaurants			A-2 occupancy	
Kitchen	1000	sf	4	8 Employees per Shift
Dining room	1000	sf	22	Spaces Required 1 Space per 45 sf Dining Room
Restrooms	496	sf		
Office	158	sf		
Total:	**2644**	**sf**	**26**	**Spaces Required**
Existing Retail Strip			B occupancy	
Retail	7091	sf	38	Spaces Required 5.5 pe...
Total:	**7091**	**sf**	**38**	**Spaces Required**
Church Building			A-1 occupancy	
Assembly	2000	sf	57	Spaces Required 1:35
Church...	2009	sf	8	Spaces Required 1:250
Total:	**4009**	**sf**	**65**	**Spaces Required**
Museums			B occupancy	
Museums	9567	sf	32	Spaces Required 1:300
Museums			4	8 Employees per Shift
Total:	**9567**	**sf**	**32**	**Spaces Required**
Over all Total:	**23311**	**sf**	**161**	**Spaces Required**
			28	Spaces Provided South of Retail
			36	Spaces Provided South of Retail
			14	Spaces Provided East o...
			18	Spaces Provided South of Museum
			13	Spaces Provided South of Museum
			109	Total Spaces Provided
			-52	Spaces Provided

Parking Study - New Construction

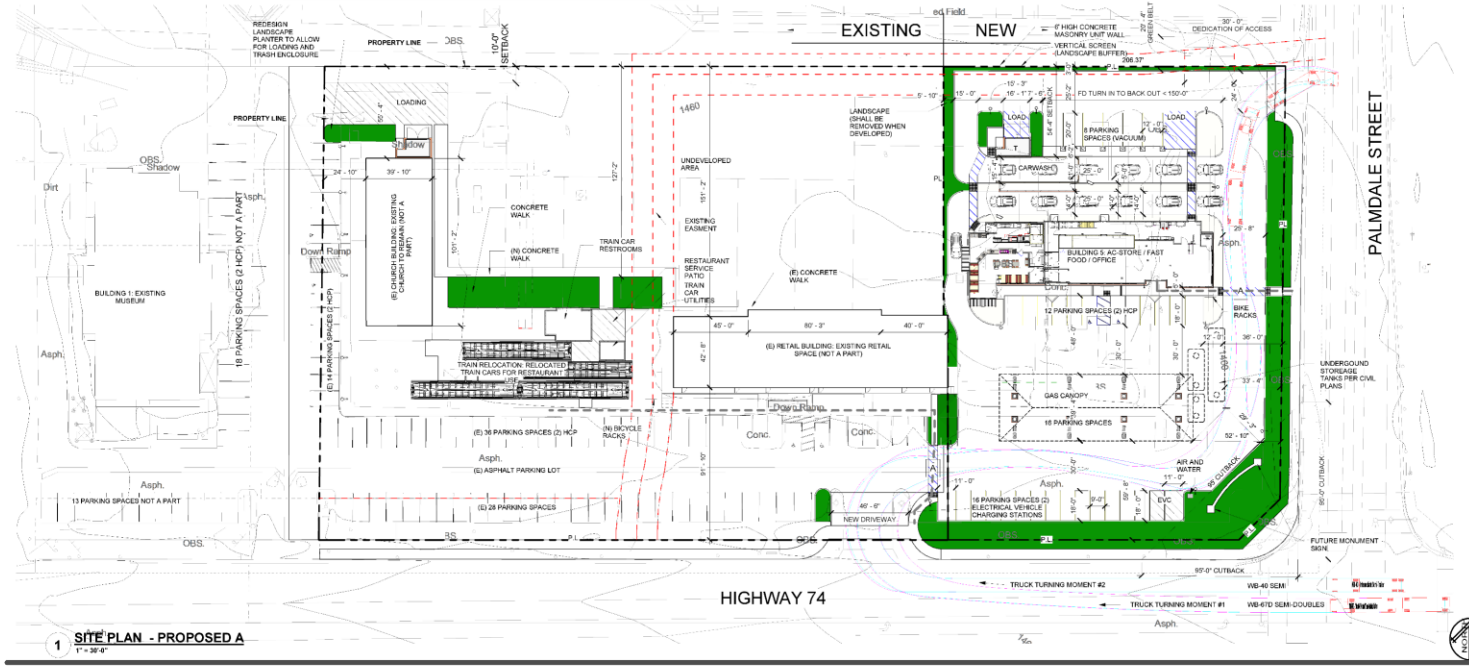
	Area			Spaces Required
C-Store and Restaurant :				
Resta...			A-2 occupancy	
Kitchen	1002	sf	2	4 Employees per Shift
Dining room	761	sf	17	Spaces Required 1 Space per 57 sf Dining Room
C-Store	3830	sf	19	Spaces Required 1:200
Office	965	sf	4	Spaces Required 1:250
Total:	**6578**	**sf**	**42**	**Spaces Required**
Carwash			B occupancy	
Machine Room	229	sf	0	Same Employees are in C-Store
Tunnel	801	sf		
Total:	**1030**	**sf**	**0**	**Spaces Required**
Gas Canopy			U occupancy	
Gas Canopy	4709	sf	0	Same Employees are in C-Store
Total:	**4709**	**sf**	**0**	**Spaces Required**
Over all Total:	**12317**	**sf**	**42**	**Spaces Required**
			16	Spaces Provided South
			16	Spaces Provided Canopy
			12	Spaces Provided Infront of C-Store
			8	Spaces Provided Vacuum
			52	Total Spaces Provided
			10	Spaces Over Parked

COMMENT #32: A CLASS THREE BIKE ROUTE EXISTS FROM PALMDALE STREET SOUTH TO HIGHWAY 79 WEST NORTH AT PROPERTY WEST EDGE TO NORTH PROPERTYLINE.
COMMENT #36: PAINT IS TO BE APPLIED TO THE BUILDINGS ON HIGHWAY 74. THE PAINT IS TO BE PART OF THE APPROVED PAINT PALETTE.
COMMENT #44: PER MENIFEE MUNICIPAL CODE, NEW TREE SPACING IS 30' ALONG BUILDING DIMENSIONS.
COMMENT #49: SEE DR-1 FOR PLANTERS AND DIMENSIONS
EXISTING BUS STOP SIGN IS TO REMAIN.
CIRCULATION
COMMENT #29: SEE SHEET DR-1 FOR SITE CIRCULATION INFORMATION.
COMMENT #30: SEE SHEET DR-1 ACCESSIBLE ROUTE MARKED WITH DASHED LINE AND AN OUTLINED: A

3 **DESIGN REVIEW NOTES**
1/8" = 1'-0"

WSC DESIGN
1844 W. 11th St. Suite D
Upland, Ca. 91710
909-262-9765
www.wscdesign.com

Revision		
Number	Description	Date



1 **SITE PLAN - PROPOSED A**
1" = 30'-0"

C-Store, Restaurant & Carwash Design For:

Motte's Romola Farms

18-508
1-22-2020

North West Corner of 74 and Palomar Rd, Menifee, CA

DR-1

PROPOSED SITE PLAN

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.

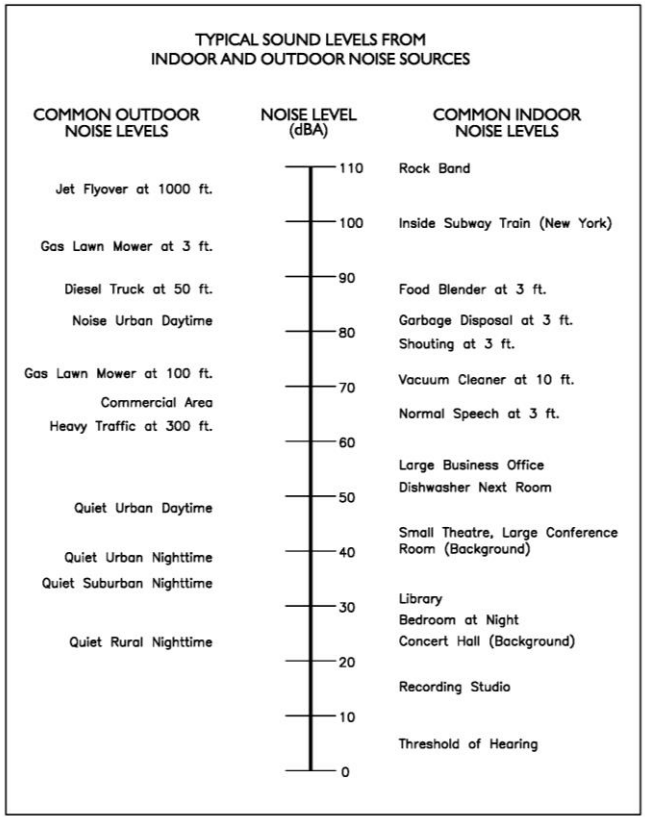
2.1 Sound, Noise and Acoustics

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 out at 20 Hz all the way to the high pitch of 20,000 Hz.

Exhibit C: Typical A-Weighted Noise Levels



2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines it loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measure in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (µPa). One µPa is approximately one hundred billionths (0.00000000001) 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.

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 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.

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm

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 addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after 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: *A*ny unwanted sound or sound which is undesirable because it interferes with speech and hearing, or 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 depends on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2–3 axle) and heavy truck percentage (4 axle and greater), and sound propagation. The greater the volume of traffic, higher speeds and 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 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 Perception

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

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

4.0 Regulatory Setting

The proposed project is located in the City of Menifee 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, or alternatively 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.

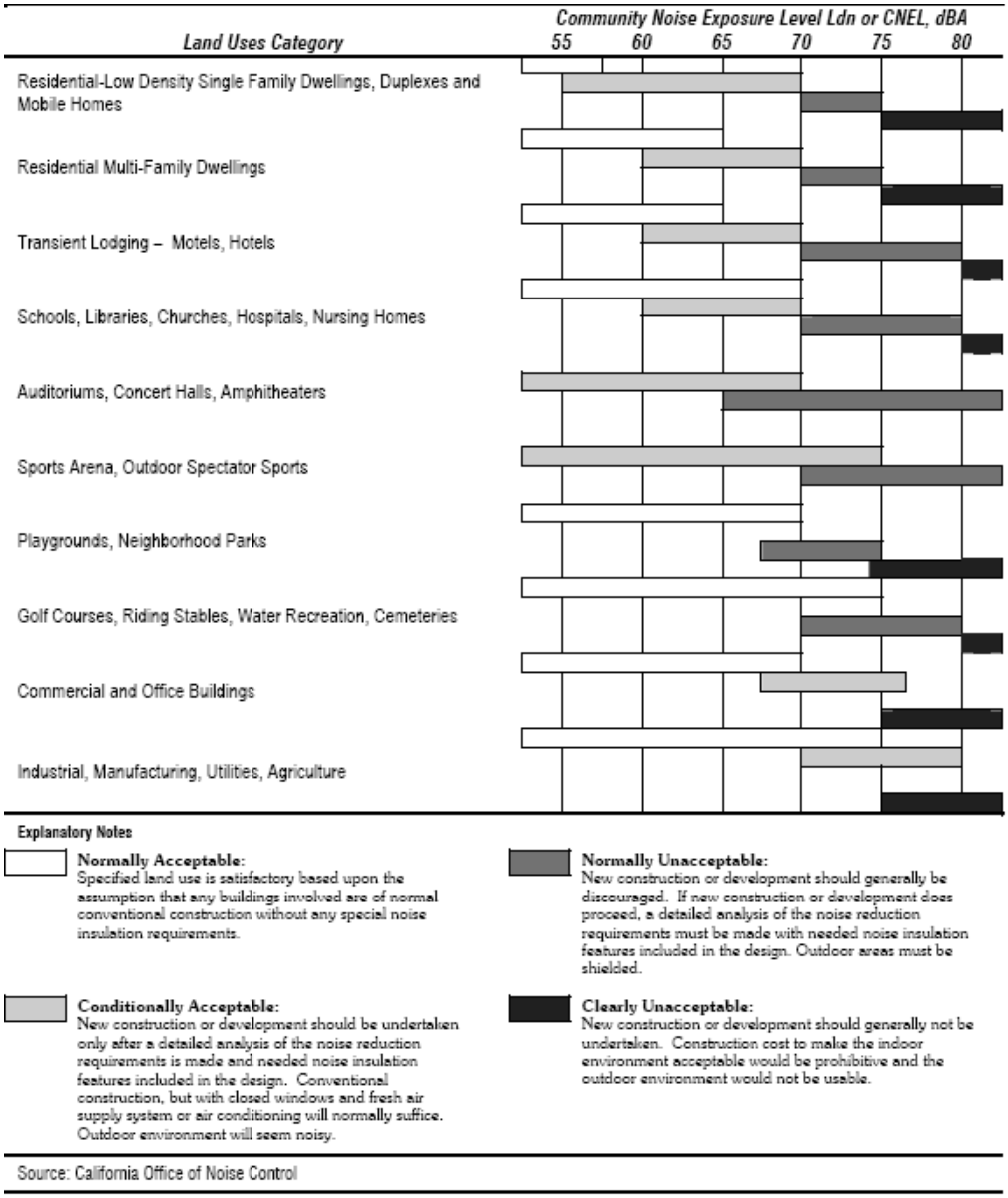
4.2 State Regulations

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

Exhibit D: Land Use Compatibility Guidelines



4.3 City of Menifee Noise Regulations

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

Applicable policies and standards governing environmental noise in the City are set forth in the Municipal Code (Chapter 9.09.050 General Sound Level Standards) and the General Plan Draft. Table 1 from the City's noise ordinance and Table 5.12-4 from the City's General Plan 2030 outlines the acceptable Interior/Exterior noise performance standards for Residential uses is detailed in Table 1 (below):

Table 1: Noise Level Performance Standards for Nontransportation Noise Sources[1]

Noise Level Descriptor	7:00 am to 10:00 pm	10:00 pm to 7:00 am
Interior Standard	55 Leq	40 Leq
Exterior Standard	65 Leq	45 Leq

Source: Chapter 9.09.050 Noise Control Regulation & City of Menifee General Plan Draft, Noise Element, Table 5.12-4
Notes:
Each of the noise levels specified shall be lowered by 5 decibels for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The noise standard is to be applied at the property lines of the affected land use.

Project operations will occur during hours of 7:00 am to 10:00 pm. Therefore, the project must demonstrate compliance to the City's 65 dBA noise limit.

In addition to the noise standards, the City has outlined goals, policies and implementation measures to reduce potential noise impacts and are presented below:

Goals, Policies, and Implementation Measures

Policies and goals from the Safety and Noise Chapter that would mitigate potential impacts on noise include the following.

Noise-Sensitive Land Uses

N-1 Noise-sensitive land uses are protected from excessive noise and vibration exposure.

Policies: Policy & Regulation

N-1.1 Assess the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing development project applications.

N-1.2 Require new projects to comply with the noise standards of local, regional, and state building code regulations, including but not limited to the city's Municipal Code, Title 24 of the California Code of Regulations, the California Green Building Code, and subdivision and development codes.

N-1.3 Require noise abatement measures to enforce compliance with any applicable regulatory mechanisms, including building codes and subdivision and zoning regulations, and ensure that the recommended mitigation measures are implemented.

N-1.4 Regulate the control of nuisances, such as residential party noise and barking dogs, through the city's Municipal Code.

N-1.5 Protect agricultural uses from noise complaints that may result from routine farming practices.

N-1.6 Coordinate with the County of Riverside and adjacent jurisdictions to minimize noise impacts from adjacent land uses along the city's boundaries, especially its rural edges.

N-1.7 Mitigate exterior and interior noises to the levels listed in table 1 to the extent feasible, for stationary sources adjacent to sensitive receptors

Policies: Siting & Design

N-1.8 Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state, and city noise standards and guidelines as a part of new development review.

N-1.9 Limit the development of new noise-producing uses adjacent to noise-sensitive receptors and require that new noise-producing land be are designed with adequate noise abatement measures

N-1.10 Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors adjacent to the I-215 or within the projected noise contours of any adjacent airports.

N-1.11 Discourage the siting of noise-sensitive uses in areas in excess of 65 dBA CNEL without appropriate mitigation.

N-1.12 Minimize potential noise impacts associated with the development of mixed-use projects (vertical or horizontal mixed-use) where residential units are located above or adjacent to noise-generating uses.

N-1.13 Require new development to minimize vibration impacts to adjacent uses during demolition and construction.

Hearing Draft Implementation Policies

Action N-1 Require subdivisions adjacent to developed/occupied noise-sensitive land uses to submit a construction-related noise mitigation plan to the City for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through methods such as: temporary noise attenuation fences; preferential location of equipment, and current noise suppression technology and equipment.

Action N-2 Prepare and adopt a Local Noise Ordinance and include, at a minimum, the following components: noise level measurement criteria exterior and interior noise standards, standards for residential noise sources such as, but not limited to, leaf blowers, mobile vendors, mobile stereos and stationary noise sources such as home appliances, air conditioners, and swimming pool equipment.

Action N-3 Require that a noise analysis be conducted by an acoustical specialist for all proposed noise-sensitive projects. Identify specific structural and site design features that will adequately mitigate noise impacts of nearby noise-generating uses or proposed noise-generating uses. Mitigation strategies could include setbacks, enclosures, sound walls, or natural barriers and landscaping, including hills, berms, boulders, and dense vegetation

Action N-4 Require that a noise analysis be conducted by an acoustical specialist for all proposed projects that are potential major noise producers, including, but not limited to industrial, manufacturing, commercial uses, water treatment facilities, and schools. Identify structural and site design features that will adequately mitigate noise impacts if the project is either within proximity of a noise-sensitive land use, or on land designated for noise-sensitive land uses. Mitigation strategies could include selection of quieter equipment, setbacks, building design, enclosures, sound walls, or natural barriers and landscaping, including hills, berms, boulders, and dense vegetation.

Action N-5 Require applicants proposing the development of new noise-sensitive uses in areas exposed to ambient noise levels greater than 60 dBA CNEL to provide an acoustical study to demonstrate that the proposed uses will meet applicable noise standards and include mitigation strategies.

Action N-6 As part of any approvals of noise-sensitive projects where reduction of exterior noise to 65 dBA CNEL is not reasonably feasible, the developer shall be required to issue disclosure statements to be identified on all real estate transfers associated with the affected property that identifies regular exposure to noise.

Action N-7 Enforce Right-to-Farm Ordinance to protect Menifee's agricultural resources from noise complaints.

Siting and Design

Action N-8 Assist the efforts of local homeowners living in high noise areas to noise attenuate their homes through funding assistance and retrofitting program development, as feasible.

Transportation Noise

Action N-9 work with Caltrans to evaluate the potential need for sound barriers and/or other mitigation strategies along segments of I-215 that abut existing noise sensitive land use.

Action N-10 Work with the Southern California Rail Authority and Union Pacific Railroad to construct noise barriers and implement quiet zones in areas where noise-sensitive uses exist or are proposed adjacent to railroad tracks, where feasible.

Action N-11 Implement quiet zone standards for new railroad crossings.

Action N-12 Review development proposals to determine if they are within an airport noise impact area, and if so, require the proposed development to comply with the applicable airport land use noise compatibility criteria.

Action N-13 Evaluate existing roadways and repair paving in sections that need improvement.

Action N-14 Encourage and facilitate the use of non-motorized and electric vehicles.

Noise Spillover

Action N-15 Require that the parking structures, terminals, and loading docks of commercial, industrial, office, and other noise-generating land uses be designed and managed to minimize the potential noise impacts of vehicles on site as well as on adjacent land uses.

Construction Noise Regulations

The following outlines the construction related exemption as outlined within Section 9.09.030 – Construction-Related Exemptions

Exceptions may be requested from the standards set forth in § 9.09.040 or 9.09.060 of this chapter and may be characterized as construction-related, single event or continuous events exceptions.

(A) Private construction projects, with or without a building permit, located one-quarter of a mile or more from an inhabited dwelling.

(B) Private construction projects, with or without a building permit, located within one-quarter of a mile from an inhabited dwelling, provided that:

(1) Construction does not occur between the hours of 6:00 p.m. and 6:00 a.m. the following morning during the months of June through September; and

(2) Construction does not occur between the hours of 6:00 p.m. and 7:00 a.m. the following morning during the months of October through May.

(C) Construction-related exceptions. A construction-related exception shall be considered either a minor temporary use or a major temporary use as defined in Chapter 9.06 of this code. An application for a construction-related exception shall be made using the temporary use application provided by the Community Development Director in Chapter 9.06 of this code. For construction activities on Sunday or nationally recognized holidays, § 8.01.010 shall prevail.

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 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 to CalTrans technical noise specifications. 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 wind screen 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, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

5.2 Long-Term 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. The long-term noise measurement was conducted on the northern property line of the project site and represents ambient levels at the site. Appendix A includes photos, field sheet, and measured noise data. Exhibit E (next page) illustrates the location of the measurement.

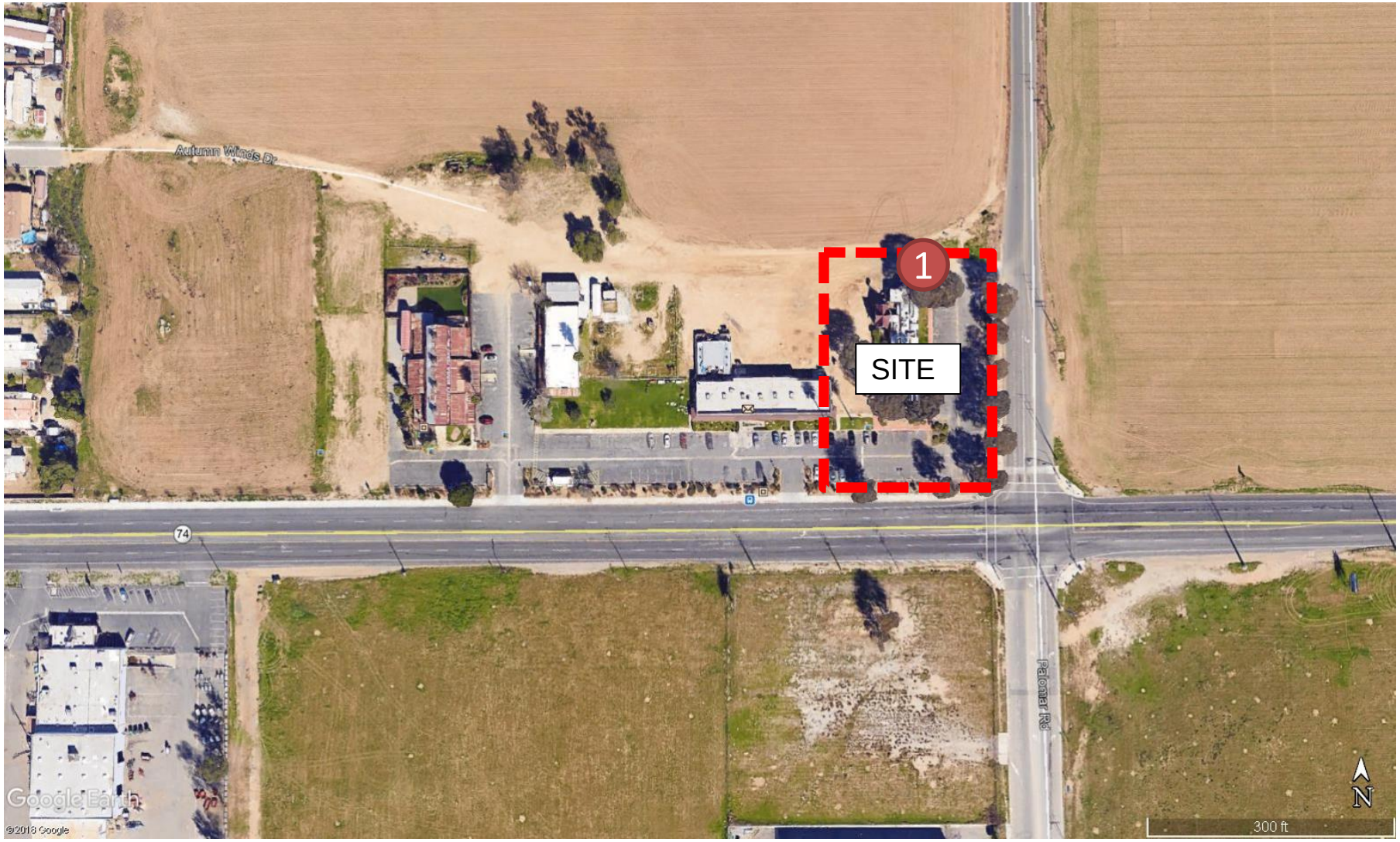
5.3 FHWA Traffic Noise Prediction Model

Traffic noise from vehicular traffic was projected using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Roadway volumes were provided by Webb Associates, Inc (Traffic Impact Analysis Motte Country Plaza, January 2021).

1 = 24-hour noise reading

Exhibit E

Measurement Locations



The referenced traffic data was applied to the model and is in Appendix B. The following outlines the key adjustments made to the REMEL for the roadway inputs:

- Roadway classification – (e.g. freeway, major arterial, arterial, secondary, collector, etc),
- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic Volumes (ADT), Travel Speeds, Percentages of automobiles, medium trucks and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour through-out a 24-hour period

Table 2 indicates the roadway parameters and vehicle distribution utilized for this study.

Table 2: Roadway Parameters and Vehicle Distribution

Roadway	Segment	Existing ADT	Existing Plus Project ADT	Speed (MPH)	Site Conditions
SR-74	Sherman Road to Antelope Road	30,610	31,631	45	Soft
SR-74	Antelope Road to Palomar Road	27,692	28,917	45	Soft
SR-74	Palomar Road to Menifee Road	29,136	30,769	45	Soft
SR-74	Menifee Road to Briggs Road	33,885	34,906	45	Soft
Matthews Road	Palomar Road to Menifee Road	3,398	4,010	50	Soft
Palomar Road	SR-74 to Matthews Road	5,583	6,604	50	Soft
Menifee Road	Matthews Road to Rouse Road	11,402	12,423	50	Soft
Menifee Road	Rouse Road to Heritage Lake Drive	13,938	14,877	50	Soft
Menifee Road	Heritage Lake Dr to McCall Boulevard	13,865	14,682	50	Soft
Vehicle Distribution (Truck Mix)[2]					
Motor-Vehicle Type		**Daytime % (7AM to 7 PM)**	**Evening % (7 PM to 10 PM)**	**Night % (10 PM to 7 AM)**	**Total % of Traffic Flow**
Automobiles		75.5	14.0	10.5	97.42
Medium Trucks		48.9	2.2	48.9	1.84
Heavy Trucks		47.3	5.4	47.3	0.74

Notes:
[1] ADT volumes based on Motte Country Plaza Traffic Impact Analysis.
[2] Vehicle distribution data is based on Riverside County vehicle percentages.

The following outlines key adjustments to the REMEL for project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

MD projected the traffic noise levels to the on-site receptors. The project noise calculation worksheet outputs are located in Appendix B.

5.4 SoundPLAN Model

SoundPLAN (SP) 8.0 acoustical modeling software was utilized to model traffic noise level projections and future worst-case project operational noise impacts (stationary noise sources) to the on-site and nearest off-site sensitive receptors.

SP is capable of evaluating multiple stationary noise sources at various receiver locations. SP's software utilizes algorithms (based on the inverse square law) 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. MD has performed spectral noise measurements on car wash blower systems and has utilized that data as inputs for said project. Further information on SoundPlan's capabilities can be explored at the following link (https://www.environmental-expert.com/software/soundplan-noise-control-and-noise-mapping-software-15467).

Daytime Assumptions:
The future worst-case noise level projections associated with the automatic car wash were modeled using reference sound level data for the Ryko slimline blowers and Vacutec vacuums/turbines. The model assumes that the car wash tunnel is approximately 45 feet long, 16 to 18 feet tall and will have an approximate 12-foot-wide by 10-foot-tall exit opening. The blowers were modeled at 10 to 12 feet high with two (2) side blowers and one (1) central blower. The blowers will be located approximately 5 to 10 feet inside the exit of the tunnel. The manufacturer's reference equipment sound level data is provided in Appendix C.

The SP model assumes a total of 6 vacuums, the speakerphone, and the dryer systems are operating simultaneously (worst-case), when in reality the noise will be intermittent and lower in level. The vacuums have a reference level of 74.0 dBA, the blowers have a reference level of 102.0 dBA and the speakerphone has a reference level of 70 dBA.

All other noise producing equipment (e.g. compressors, pumps) will be housed within mechanical equipment rooms.

In addition, the parking lot was modeled as an area source based upon the number of parking spaces with an estimated 5 to 25% turnover rate during the peak hour (depending on location and parking lot). Noise associated with parking lots include but are not limited to idling cars, doors closing, and starting engine noise. Noise levels associated with parking lots can reach peak levels of 80 dBA. Modeling input and output assumptions are indicated in Appendix C.

The gas canopy was modeled as an area source with a reference level of 60 dBA at 3 feet. This represents sound associated with pump of gas and noise under the canopy (typically gas pumps have screens with speakers and potential outdoor loudspeakers). As part of the project design, any loudspeakers will have volume gain knobs which can be adjusted so that the sound is not audible at the project site property line.

Nighttime Assumptions:
Same assumption as defined in the daytime with the exception that car wash and associated amenity are not operational.

5.5 FHWA Roadway Construction Noise Model

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RNCM), 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, concrete and building phases of construction. The construction noise calculation output worksheet is located in Appendix D. The following assumptions relevant to short-term construction noise impacts were used:

- It is estimated that construction will occur over a 6 month to 1-year time period. Construction noise is expected to be the loudest during the grading, concrete, and building phases.

6.0 Existing Noise Environment

An ambient noise measurement was conducted at the site to determine the existing baseline levels. Noise measurement data indicates that traffic noise propagating from SR-74 is the primary source of noise impacting the site and surrounding areas.

6.1 Long-Term Noise Measurement Results

The results of the long-term noise data are presented in Table 3.

Table 3: Long-Term Noise Measurement Data (dBA)[1]

Date	Time	dB(A)							
		L_{EQ}	L_{MAX}	L_{MIN}	L_2	L_8	L_{25}	L_{50}	L_{90}
4/2/2018	1PM-2PM	59.3	77.9	47.5	67.0	61.8	55.8	55.8	51.0
4/2/2018	2PM-3PM	58.7	82.0	45.1	65.0	61.2	55.4	55.4	50.6
4/2/2018	3PM-4PM	60.2	80.9	46.6	66.9	62.0	56.3	56.3	51.2
4/2/2018	4PM-5PM	61.2	81.2	46.9	68.4	63.9	58.3	58.3	53.0
4/2/2018	5PM-6PM	60.7	77.8	51.5	68.4	63.5	58.1	58.1	52.8
4/2/2018	6PM-7PM	60.2	81.0	47.0	67.1	62.6	57.3	57.3	52.3
4/2/2018	7PM-8PM	59.5	76.6	49.2	67.2	61.9	56.1	56.1	51.3
4/2/2018	8PM-9PM	57.8	73.1	45.6	65.6	61.4	55.1	55.1	49.4
4/2/2018	9PM-10PM	58.5	79.6	46.2	67.0	61.1	54.7	54.7	48.7
4/2/2018	10PM-11PM	58.0	78.6	43.3	65.0	60.0	53.3	53.3	46.9
4/2/2018	11PM-12AM	58.0	83.6	41.3	64.8	58.6	51.0	51.0	42.6
4/3/2018	12AM-1AM	52.4	72.8	42.0	60.9	56.3	47.5	47.5	39.6
4/3/2018	1AM-2AM	50.2	64.9	33.4	59.1	54.9	44.4	44.4	34.8
4/3/2018	2AM-3AM	51.2	68.9	33.6	59.7	55.9	45.5	45.5	35.8
4/3/2018	3AM-4AM	55.5	73.3	33.1	63.8	60.0	51.0	51.0	42.0
4/3/2018	4AM-5AM	58.0	71.1	38.6	65.1	62.3	55.2	55.2	47.8
4/3/2018	5AM-6AM	58.6	70.9	45.8	65.2	62.9	56.1	56.1	48.6
4/3/2018	6AM-7AM	59.0	71.0	49.8	64.9	62.6	57.3	57.3	51.4
4/3/2018	7AM-8AM	60.0	77.8	54.7	66.4	63.2	57.5	57.5	51.5
4/3/2018	8AM-9AM	58.9	77.1	50.3	65.6	62.6	56.5	56.5	50.9
4/3/2018	9AM-10AM	62.1	83.2	46.7	70.7	62.2	55.6	55.6	48.6
4/3/2018	10AM-11AM	58.2	73.0	44.5	66.3	61.8	55.6	55.6	49.2
4/3/2018	11AM-12PM	72.6	92.9	46.6	84.7	72.3	58.3	58.3	51.1
4/3/2018	12PM-1PM	62.0	84.8	48.2	69.1	62.7	55.6	55.6	50.0
CNEL		65.2							

Notes:
[1.] Long-term noise monitoring location 1 (LT1) is illustrated in Exhibit E. The quietest daytime hourly noise interval is highlighted in orange and the quietest nighttime level in blue.

Noise data indicates the ambient noise levels ranged between 55.5 to 72.6 dBA Leq(h) near the northern property line of the project site. The CNEL measured 65.2 dBA. Maximum levels measured 72.6 dBA during the 11Am-12PM hour. The quietest noise level measured 50.2 dBA during the 1AM-2AM hour.

For this evaluation, MD utilized the quietest hourly level (during daytime and nighttime hours) and has compared the project's projected noise levels to said quietest ambient noise. The quietest (lowest) daytime hourly level occurred between 8PM to 9PM (57.8 dBA Leq(h)). The quietest nighttime level occurred between 1AM to 2AM (50.2 dBA Leq(h)).

7.0 Future Noise Environment Impacts and Mitigation

This assessment analyzes future noise impacts to and from the project 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 Project Generated Traffic

Traffic noise along SR-74 will be the main source of noise impacting the project site and the surrounding area.

A worst-case project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. Traffic noise levels were calculated 50 feet from the centerline of the analyzed roadway. The modeling is theoretical and does not take into account any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the levels are shown for comparative purposes only to show the difference in with and without project conditions. In addition, the noise contours for 60, 65 and 70 dBA CNEL were calculated. The potential off-site noise impacts caused by an increase of traffic from operation of the proposed project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions.

Existing Year (Plus Project): This scenario refers to existing year + project traffic noise conditions.

Table 4 compares the without and with project scenario and shows the change in traffic noise levels as a result of the proposed project. It takes a change of 3 dB or more to hear a perceptible difference. As demonstrated in Table 5, the project is anticipated to change the noise 0.1 to 0.8 dBA CNEL. Although there is a nominal increase along the evaluated roadways, the proposed increase would still be below the 65 dBA CNEL residential standard at any off-site receptors. All existing residences are located behind existing barriers and/or are located outside the 65 dBA contour.

Although there is an increase in traffic noise levels the impact is considered less than significant as the noise levels at or near any existing proposed sensitive receptor would be 65 dBA CNEL or less and the change in noise level is less than 3 dBA. No further mitigation is required.

<Table 4, next page>

Table 4: Existing Scenario – Noise Levels Along Roadways (dBA CNEL)

Roadway	Segment	CNEL at 50 Ft (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
SR-74	Sherman Road to Antelope Road	73.5	86	185	399	860
SR-74	Antelope Road to Palomar Road	73.1	80	173	373	805
SR-74	Palomar Road to Menifee Road	73.3	83	179	386	832
SR-74	Menifee Road to Briggs Road	74.0	92	198	427	921
Matthews Road	Palomar Road to Menifee Road	64.4	21	45	98	211
Palomar Road	SR-74 to Matthews Road	66.5	29	63	136	293
Menifee Road	Matthews Road to Rouse Road	70.3	52	112	242	522
Menifee Road	Rouse Road to Heritage Lake Drive	71.2	60	129	277	597
Menifee Road	Heritage Lake Dr to McCall Boulevard	71.1	59	128	259	558

Existing With Project Exterior Noise Levels

Roadway	Segment	CNEL at 50 Ft (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
SR-74	Sherman Road to Antelope Road	73.7	88	189	408	879
SR-74	Antelope Road to Palomar Road	73.3	83	178	384	828
SR-74	Palomar Road to Menifee Road	73.6	86	186	401	863
SR-74	Menifee Road to Briggs Road	74.1	94	202	436	939
Matthews Road	Palomar Road to Menifee Road	65.1	24	51	109	235
Palomar Road	SR-74 to Matthews Road	67.3	33	71	152	328
Menifee Road	Matthews Road to Rouse Road	70.7	55	119	257	553
Menifee Road	Rouse Road to Heritage Lake Drive	71.4	62	134	289	623
Menifee Road	Heritage Lake Dr to McCall Boulevard	71.4	62	133	287	618

Change in Existing Noise Levels as a Result of Project

Roadway[1]	Segment	CNEL at 50 Feet dBA[2]			
		Existing Without Project	Existing With Project	Change in Noise Level	Potential Significant Impact
SR-74	Sherman Road to Antelope Road	73.5	73.7	0.1	No
SR-74	Antelope Road to Palomar Road	73.1	73.3	0.2	No
SR-74	Palomar Road to Menifee Road	73.3	73.6	0.2	No
SR-74	Menifee Road to Briggs Road	74.0	74.1	0.1	No
Matthews Road	Palomar Road to Menifee Road	64.4	65.1	0.7	No
Palomar Road	SR-74 to Matthews Road	66.5	67.3	0.8	No
Menifee Road	Matthews Road to Rouse Road	70.3	70.7	0.4	No
Menifee Road	Rouse Road to Heritage Lake Drive	71.2	71.4	0.2	No
Menifee Road	Heritage Lake Dr to McCall Boulevard	71.1	71.4	0.3	No

Notes:
[1] Exterior noise levels calculated at 5 feet above ground level.
[2] Noise levels calculated from centerline of subject roadway.

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

Sensitive receptors that may be affected by project operational noise include adjacent land uses to the immediate south, north, and east. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. Worst-case assumes the blowers, vacuums, equipment and parking are always operational when in reality the noise will be intermittent and cycle on/off depending on the customer usage. Project car wash operations are assumed to occur within the City's allowable daytime (7 a.m. to 10 p.m.) hours, while the gas station will operate both during daytime and nighttime hours (10 p.m. to 7 a.m.) as well.

A total of two (2) receptors (R1 – R2) were modeled to evaluate the proposed project's operational impact. A receptor is denoted by a yellow or green dot in Exhibit F. All yellow dots represent either a property line or a sensitive receptor such as an outdoor sensitive area (e.g. backyard, patio, common area). The nearest sensitive receptors are located to the north where it has a specific plan designation of high density residential.

This study compares the project's operational noise levels to two (2) different scenarios: 1) Project operational noise level projections and, 2) Project plus ambient noise level projections.

Project Operational Noise Levels

Exhibit F shows the project only operational noise levels at the property lines and/or sensitive receptor areas. Exhibit G illustrates the noise contours at the project site and illustrates how the noise will propagate at the site. Operational noise levels are anticipated to range between 42.7 to 61.8 dBA Leq(h) at the receptors R1 through R2 during daytime hours (7AM – 10PM) and 20.8 to 28.9 dBA Leq(h) during nighttime hours (10PM – 7AM). The noise projections to the nearby sensitive receptors are below the City's 65 dBA daytime limit and the City's 45 dBA nighttime limit.

Project Plus Ambient Operational Noise Levels

Table 5 demonstrates the project plus ambient daytime noise levels. Project plus ambient noise level projections are anticipated to range between 57.9 to 63.3 dBA Leq(h) at the receptors R1 through R2 with the inclusion of an 6ft CMU wall along the northern property line. The noise projections are below the City's 65 dBA daytime limit.

As previously mentioned gas station operations are anticipated to occur during nighttime hours. The baseline noise data confirms that the quietest hour occurred between 1AM to 2AM. Therefore, MD utilized the quietest measured hourly noise level and compared the nighttime operations to the City's nighttime noise regulations. The existing nighttime condition exceeds the City's 45 dBA noise limit. Therefore, MD compared the noise project's noise projections to the quietest hourly noise interval and provided a change in noise level comparison. As shown in Table 6, the change in the nighttime baseline condition during the quietest hour is anticipated to have a maximum 0.0 dBA change which is not perceptible.

Gas station "only" operations are anticipated to not change the baseline existing condition. Therefore, the impact is less than significant with the proposed mitigation measures.

Table 5: Worst-case Predicted Operational Noise Levels (dBA)

Receptor[1]	Existing Ambient Noise Level (dBA, Leq(h))[2]	Project Noise Level (dBA, Leq(h))[3]	Total Combined Noise Level (dBA, Leq(h))	Daytime (7AM - 10PM) Stationary Noise Limit (dBA, Leq (h))	Change in Noise Level as Result of Project
1	57.8	61.8	63.3	**65**	5.5
2	57.8	42.7	57.9		0.1

Notes:
[1.] Receptors 1 is located along the project site northern property line. The land use to the north is zoned for residential although no residential currently exists. Receptors 2 is residential areas.
[2.] See Appendix A for Existing Ambient Noise Levels.
[3.] See Exhibit F and G for the operational noise level projections at said receptors.

In addition, Table 5 provides the anticipated change in noise level as a result of the proposed project. As shown in Table 5, the operational noise levels will result in a change of 0.1 to 5.5 dBA at the various receptors. Depending on the receptor location, the change in the noise level would be not perceptible.

Table 6 demonstrates the project plus ambient average noise level during nighttime conditions when only the fast food drive through, gas canopy, and parking are operational. The project plus ambient noise level projections are anticipated to be 50.2 dBA at the receptors R1 through R2.

Table 6: Worst-case Predicted Nighttime (10PM – 7AM) Operational Noise Levels (dBA)

Receptor[1]	Existing Ambient Noise Level (dBA, Leq(h))[2]	Project Noise Level (dBA, Leq(h))[3]	Total Combined Noise Level (dBA, Leq(h))	Nighttime (10PM - 7AM) Stationary Noise Limit (dBA, Leq)	Change in Noise Level as Result of Project
1	50.2	28.9	50.2	**45**	0.0
2	50.2	20.8	50.2		0.0

Notes:
[1.] Receptors 1 is located along the project site northern property line. The land use to the north is zoned for residential although no residential currently exists. Receptors 2 is residential areas.
[2.] See Appendix A for Existing Ambient Noise Levels.
[3.] See Exhibit F and G for the operational noise level projections at said receptors.

As demonstrated in Table 6, the project will not exceed the City's 45 dBA nighttime limit.

As previously mentioned, the project would need to implement mitigation measures to ensure compliance to the limit during daytime conditions (see Section 7.2).

7.2 Mitigation Measures

In order to reduce the potential noise impact, the following mitigation measures needs to be implemented into the project design:

MM-1: The tire air compressor shall be enclosed in an acoustic enclosure

MM-2: The car wash and all its amenities (e.g. Vacuum bays) will only be operational during daytime (7 a.m. to 10 p.m.)

Exhibit F

Operational Noise Levels

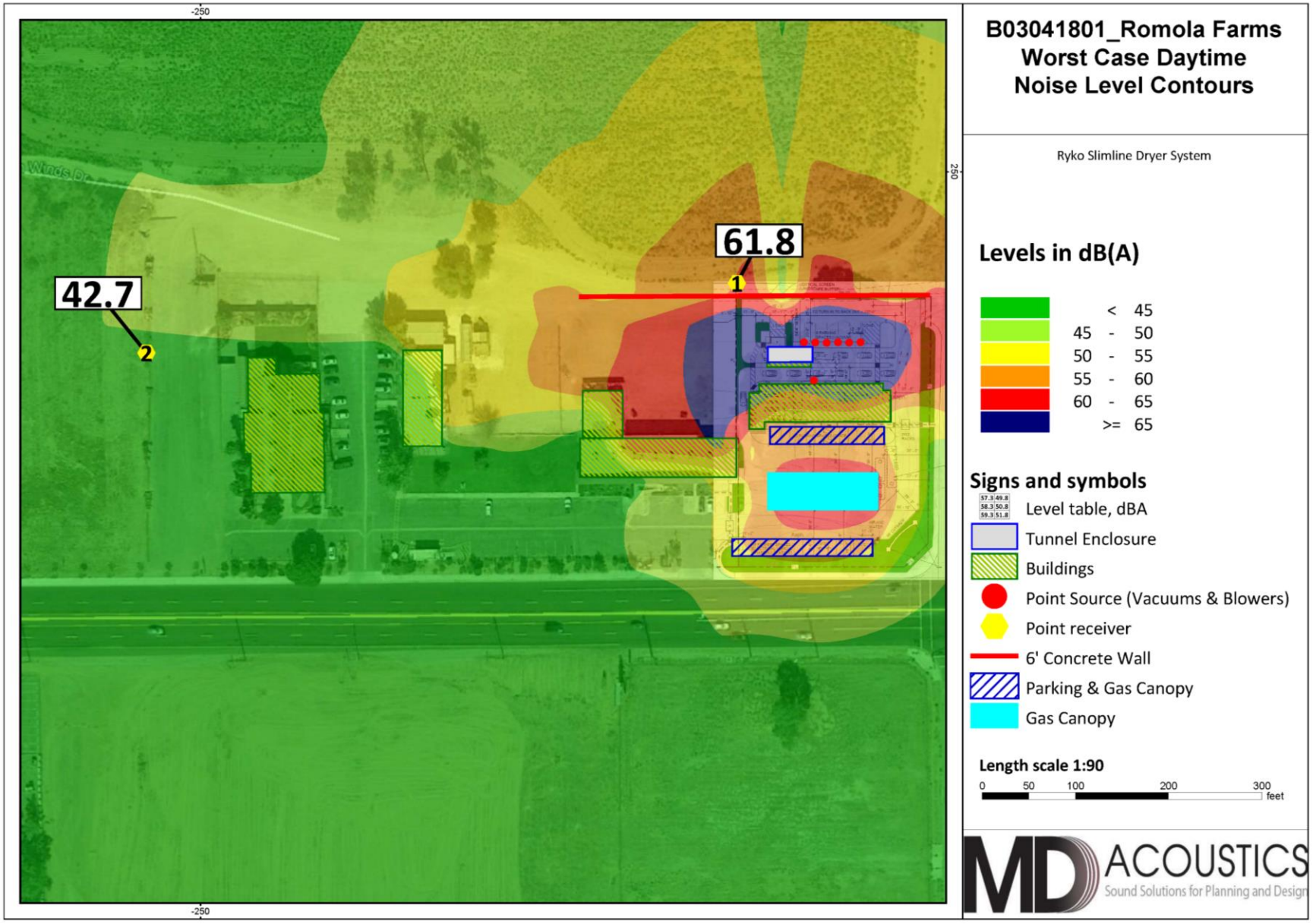
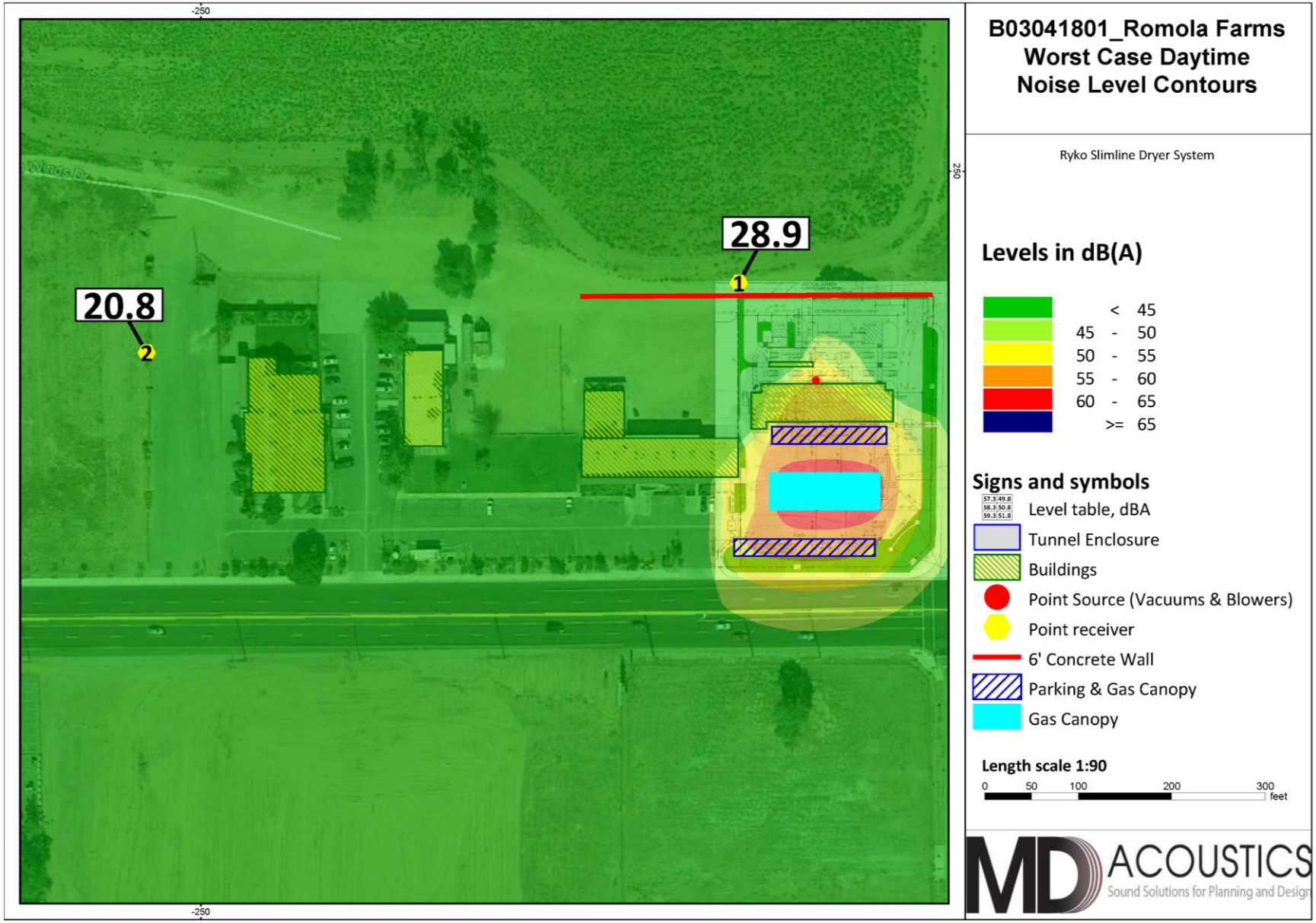


Exhibit G

Nighttime Operational Noise Level



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 6.

Table 6: Typical Construction Noise Levels[1]

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 noise is considered a short-term impact and would be considered significant if construction activities are taken outside the allowable times as described in the City's Municipal Code (Section 9.09.030). Existing residences to the west may be temporarily affected by short-term noise impacts associated the transport of workers, the movement of construction materials to and from the project site, ground clearing, excavation, grading, and building activities. The noise analysis reviews the construction noise levels during the various phases of the project.

Project generated construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. Site grading is expected to produce the highest sustained construction noise levels. Typical noise sources and noise levels associated with the site grading phase of construction are shown in Table 7. 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 grading phase. A likely worst-case construction noise scenario during grading assumes the use of a grader, a dozer, two (2) excavators, two (2) backhoes and two (2) scrappers operating at 1,000 feet from the nearest sensitive receptor.

Assuming a usage factor of 40 percent for each piece of equipment, unmitigated noise levels at 1,000 feet have the potential to reach 58 dBA Leq and 60 dBA (Lmax) at the nearest sensitive receptors during grading. Noise levels for the other construction phases would be lower and range between 53 to 54 dBA. Output calculations are provided in Appendix D.

The project site has an approximate 1,000 feet from the western property line and will attenuate noise levels by at least 15 dBA. Noise levels will range therefore between 58 to 54 dBA, depending on the construction phases.

Off site work for the sewer line will utilize at minimum a backhoe and potentially a front-loader at the same time. Noise levels associated with pipeline placement and dirt excavation will have a noise level of 90 dBA at 50 feet from the equipment. As a project design feature the project will request exemption for construction noise provided construction occurs within the allowable hours as outlined within the Municipal Code.

Although construction will occur within 1/4 mile of existing residences, the construction noise levels will be below the City's 65 dBA daytime limit. Furthermore, construction is anticipated to occur during the permissible hours according to the City's Municipal Code. Construction noise will have a temporary or periodic increase in the ambient noise level above the existing within the project vicinity. Noise reduction measures are provided to further reduce construction noise (Section 8.3). 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 bull dozer. A large bull dozer has a vibration impact of 0.089 inches per second peak particle velocity (PPV) at 25 feet which is 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:

$$PPV_{equipment} = PPV_{ref} (100/D_{rec})^{n}$$

Where: PPV_{ref} = reference PPV at 100ft.
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 7 (below) provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 7: 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 8 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 8: Vibration Source Levels for Construction Equipment[1]

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.

At a distance of 1,000 feet, a large bull dozer would yield a worst-case 0.002 PPV (in/sec) which is well below the perception of vibration or any impact. The impact is less than significant and no mitigation is required.

8.3 Construction Noise Reduction Measures

Construction operations must follow the City's General Plan and the Noise Ordinance, which states that construction, repair or excavation work performed must occur within the permissible hours. To further ensure that construction activities do not disrupt the adjacent land uses, the following measures should be taken:

1. Construction should occur during the permissible hours as defined in Section 9.03.030 of the Municipal Code.

2. During construction, the contactor shall ensure all construction equipment is equipped with appropriate noise attenuating devices.

3. The contractor should locate equipment staging areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

4. Idling equipment should be turned off when not in use.

5. Equipment shall be maintained so that vehicles and their loads are secured from rattling and banging.

9.0 References

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

City of Menifee: General Plan Noise Element, September 2013

City of Menifee: City of Menifee Chapter 9.09 Noise Control Regulations, October 2018

Webb Associates: Motte Country Plaza Traffic Impact Analysis, January 2021

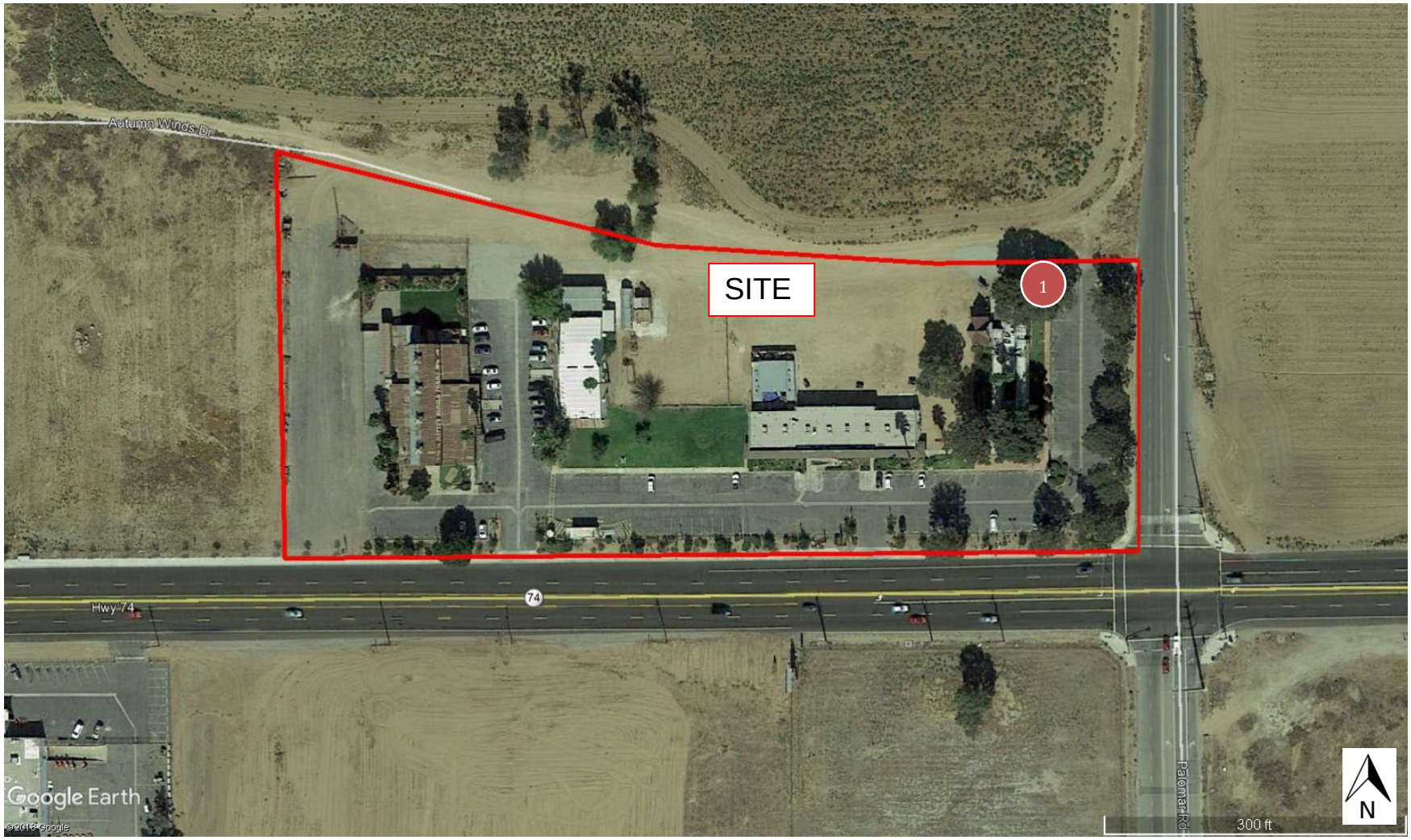
Webb Associates: Motte Country Plaza Air Quality/Greenhouse Gas Analysis, January 2021

Appendix A:

Field Measurement Data

LONG-TERM NOISE MONITORING LOCATIONS

Project: Motte's Romola Farms, Menifee Ca



MD ACOUSTICS
Sound Solutions for Planning and Design

1 = Noise Monitoring Location

= Project Boundary

FIELD SHEET - LT1

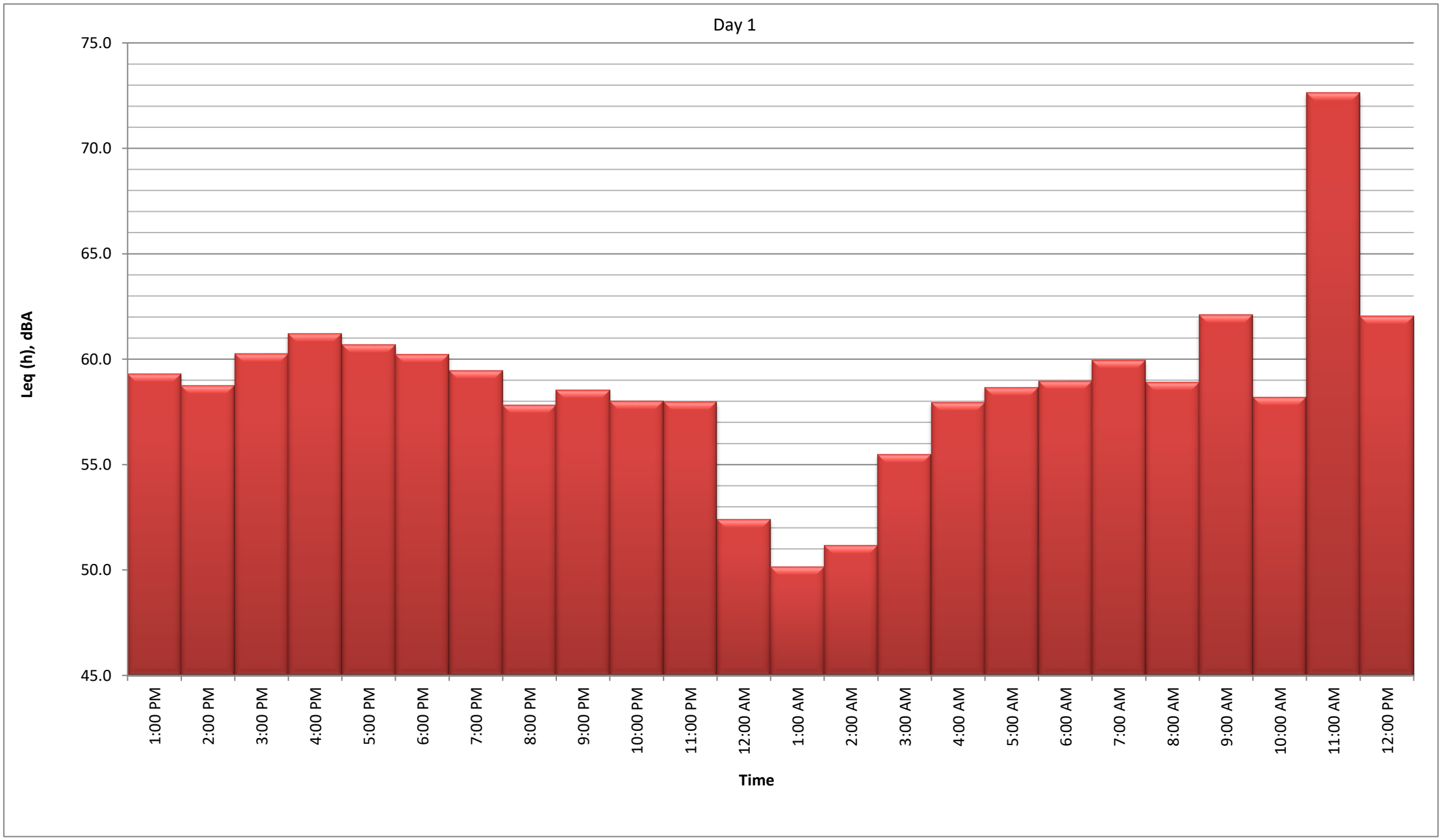
Project: Motte's Romola Farms, Menifee Ca
Measurement Address: State Hwy 74 & Palomar Road **Temp:** 52 - 65 F
Date: **4/2/2018-4/3/2018** **Day:** 1
Sound Level Meter: Larson Davis LxT1 **Setting(s):** A-weighted, slow, 1-hr intervals
Engineer: Mike Dickerson, INCE **Location:** Northeast Property line
Notes:

Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
4/2/2018	1:00 PM	2:00 PM	59.3	77.9	47.5	67.0	61.8	55.8	55.8	51.0
4/2/2018	2:00 PM	3:00 PM	58.7	82.0	45.1	65.0	61.2	55.4	55.4	50.6
4/2/2018	3:00 PM	4:00 PM	60.2	80.9	46.6	66.9	62.0	56.3	56.3	51.2
4/2/2018	4:00 PM	5:00 PM	61.2	81.2	46.9	68.4	63.9	58.3	58.3	53.0
4/2/2018	5:00 PM	6:00 PM	60.7	77.8	51.5	68.4	63.5	58.1	58.1	52.8
4/2/2018	6:00 PM	7:00 PM	60.2	81.0	47.0	67.1	62.6	57.3	57.3	52.3
4/2/2018	7:00 PM	8:00 PM	59.5	76.6	49.2	67.2	61.9	56.1	56.1	51.3
4/2/2018	8:00 PM	9:00 PM	57.8	73.1	45.6	65.6	61.4	55.1	55.1	49.4
4/2/2018	9:00 PM	10:00 PM	58.5	79.6	46.2	67.0	61.1	54.7	54.7	48.7
4/2/2018	10:00 PM	11:00 PM	58.0	78.6	43.3	65.0	60.0	53.3	53.3	46.9
4/2/2018	11:00 PM	12:00 AM	58.0	83.6	41.3	64.8	58.6	51.0	51.0	42.6
4/3/2018	12:00 AM	1:00 AM	52.4	72.8	42.0	60.9	56.3	47.5	47.5	39.6
4/3/2018	1:00 AM	2:00 AM	50.2	64.9	33.4	59.1	54.9	44.4	44.4	34.8
4/3/2018	2:00 AM	3:00 AM	51.2	68.9	33.6	59.7	55.9	45.5	45.5	35.8
4/3/2018	3:00 AM	4:00 AM	55.5	73.3	33.1	63.8	60.0	51.0	51.0	42.0
4/3/2018	4:00 AM	5:00 AM	58.0	71.1	38.6	65.1	62.3	55.2	55.2	47.8
4/3/2018	5:00 AM	6:00 AM	58.6	70.9	45.8	65.2	62.9	56.1	56.1	48.6
4/3/2018	6:00 AM	7:00 AM	59.0	71.0	49.8	64.9	62.6	57.3	57.3	51.4
4/3/2018	7:00 AM	8:00 AM	60.0	77.8	54.7	66.4	63.2	57.5	57.5	51.5
4/3/2018	8:00 AM	9:00 AM	58.9	77.1	50.3	65.6	62.6	56.5	56.5	50.9
4/3/2018	9:00 AM	10:00 AM	62.1	83.2	46.7	70.7	62.2	55.6	55.6	48.6
4/3/2018	10:00 AM	11:00 AM	58.2	73.0	44.5	66.3	61.8	55.6	55.6	49.2
4/3/2018	11:00 AM	12:00 PM	72.6	92.9	46.6	84.7	72.3	58.3	58.3	51.1
4/3/2018	12:00 PM	1:00 PM	62.0	84.8	48.2	69.1	62.7	55.6	55.6	50.0

AVERAGED DAYTIME (7AM - 7PM) LEQ: **64.0** **MAX:** 92.9 **CNEL:** **65.2**
AVERAGED EVENING TIME (7PM - 10PM) LEQ: **58.7** **MIN:** 33.1
AVERAGED NIGHTTIME (10PM - 7AM) LEQ: **56.7**

LT1 HOURLY NOISE LEVELS, Leq (h)

Project: Motte's Romola Farms, Menifee Ca
Date: **4/2/2018-4/3/2018** **Day:** 1
Sound Level Meter: Larson Davis LxT1 **Setting(s):** A-weighted, slow, 1-hr intervals
Engineer: Mike Dickerson, INCE **Location:** Northeast Property line



MD ACOUSTICS
Sound Solutions for Planning and Design

Appendix B:
Traffic FHWA Worksheets

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY SR-74
SEGMENT Sherman Road to Antelope Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	30,610
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	3,061

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.6	69.6	68.3	62.3	70.7	71.3
MEDIUM TRUCKS	62.7	58.8	51.3	60.0	66.2	66.2
HEAVY TRUCKS	63.2	59.2	55.8	60.4	66.6	66.7
VEHICULAR NOISE	72.7	70.3	68.6	65.8	73.1	**73.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	86	185	399	860
LDN	81	174	376	809

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY SR-74
SEGMENT Antelope Road to Palomar Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	27,692
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,769

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.2	69.2	67.9	61.9	70.3	70.9
MEDIUM TRUCKS	62.3	58.4	50.9	59.6	65.8	65.8
HEAVY TRUCKS	62.8	58.8	55.4	60.0	66.2	66.3
VEHICULAR NOISE	72.2	69.9	68.2	65.4	72.7	**73.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	80	173	373	805
LDN	76	163	351	757

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY SR-74
SEGMENT Palomar Road to Menifee Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	29,136
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,914

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.4	69.4	68.1	62.1	70.5	71.1
MEDIUM TRUCKS	62.5	58.6	51.1	59.8	66.0	66.0
HEAVY TRUCKS	63.0	59.0	55.6	60.2	66.4	66.5
VEHICULAR NOISE	72.5	70.1	68.4	65.6	72.9	**73.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	83	179	386	832
LDN	78	169	364	783

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY SR-74
SEGMENT Menifee Road to Briggs Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	33,885
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	3,389

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.1	70.1	68.8	62.7	71.2	71.8
MEDIUM TRUCKS	63.1	59.2	51.8	60.5	66.7	66.7
HEAVY TRUCKS	63.7	59.6	56.2	60.9	67.1	67.2
VEHICULAR NOISE	73.1	70.8	69.1	66.3	73.6	**74.0**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	92	198	427	921
LDN	87	187	402	866

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY Matthews Road
SEGMENT Palomar Road to Menifee Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	3,398
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	340

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	49.7	- -
MEDIUM TRUCKS=	4.00	49.6	- -
HEAVY TRUCKS =	8.01	49.7	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	62.8	60.7	59.4	53.4	61.8	62.5
MEDIUM TRUCKS	53.2	49.3	41.9	50.6	56.7	56.8
HEAVY TRUCKS	53.5	49.4	46.0	50.7	56.9	57.0
VEHICULAR NOISE	63.6	61.3	59.7	56.5	64.0	**64.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	21	45	98	211
LDN	20	43	92	198

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY Palomar Road
SEGMENT SR-74 to Matthews Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	5,583
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	558

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	49.7	- -
MEDIUM TRUCKS=	4.00	49.6	- -
HEAVY TRUCKS =	8.01	49.7	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	64.9	62.9	61.6	55.6	64.0	64.6
MEDIUM TRUCKS	55.4	51.5	44.0	52.7	58.9	58.9
HEAVY TRUCKS	55.6	51.6	48.2	52.8	59.0	59.1
VEHICULAR NOISE	65.8	63.5	61.9	58.7	66.1	**66.5**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	29	63	136	293
LDN	28	59	128	275

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY Menifee Road
SEGMENT Matthews Road to Rouse Road
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	11,402
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,140

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	68.7	66.7	65.3	59.3	67.7	68.4
MEDIUM TRUCKS	59.1	55.2	47.8	56.5	62.6	62.7
HEAVY TRUCKS	59.4	55.3	51.9	56.6	62.8	62.9
VEHICULAR NOISE	69.6	67.2	65.6	62.4	69.9	**70.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	52	112	242	522
LDN	49	105	227	489

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY Menifee Road
SEGMENT Rouse Road to Heritage Lake Drive
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	13,938
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,394

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	69.5	67.5	66.2	60.2	68.6	69.2
MEDIUM TRUCKS	60.0	56.1	48.6	57.3	63.5	63.5
HEAVY TRUCKS	60.2	56.2	52.8	57.4	63.6	63.7
VEHICULAR NOISE	70.4	68.1	66.5	63.3	70.7	**71.2**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	60	129	277	597
LDN	56	121	260	559

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Romola Farms Noise Impact Study
ROADWAY Menifee Road
SEGMENT Heritage Lake Dr to McCall Boulevard
LOCATION: City of Menifee SCENARIO: Existing

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	13,865
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,387

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	69.5	67.5	66.2	60.2	68.6	69.2
MEDIUM TRUCKS	60.0	56.1	48.6	57.3	63.5	63.5
HEAVY TRUCKS	60.2	56.2	52.8	57.4	63.6	63.7
VEHICULAR NOISE	70.4	68.1	66.5	63.3	70.7	**71.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	59	128	276	595
LDN	56	120	259	558

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY SR-74
SEGMENT Sherman Road to Antelope Road
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	31,631
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	3,163

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.8	69.8	68.5	62.4	70.9	71.5
MEDIUM TRUCKS	62.8	58.9	51.5	60.2	66.4	66.4
HEAVY TRUCKS	63.4	59.3	55.9	60.6	66.8	66.9
VEHICULAR NOISE	72.8	70.5	68.8	66.0	73.3	**73.7**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	88	189	408	879
LDN	83	178	384	827

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY SR-74
SEGMENT Antelope Road to Palomar Road
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	28,917
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,892

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.4	69.4	68.1	62.1	70.5	71.1
MEDIUM TRUCKS	62.4	58.5	51.1	59.8	66.0	66.0
HEAVY TRUCKS	63.0	58.9	55.5	60.2	66.4	66.5
VEHICULAR NOISE	72.4	70.1	68.4	65.6	72.9	**73.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	83	178	384	828
LDN	78	168	362	779

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY SR-74
SEGMENT Palomar Road to Menifee Road
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	30,769
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	3,077

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.7	69.6	68.3	62.3	70.7	71.4
MEDIUM TRUCKS	62.7	58.8	51.4	60.1	66.2	66.3
HEAVY TRUCKS	63.3	59.2	55.8	60.5	66.7	66.8
VEHICULAR NOISE	72.7	70.3	68.7	65.8	73.2	**73.6**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	86	186	401	863
LDN	81	175	377	812

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY SR-74
SEGMENT Menifee Road to Briggs Road
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	34,906
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	3,491

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.2	70.2	68.9	62.9	71.3	71.9
MEDIUM TRUCKS	63.3	59.4	51.9	60.6	66.8	66.8
HEAVY TRUCKS	63.8	59.8	56.4	61.0	67.2	67.3
VEHICULAR NOISE	73.3	70.9	69.2	66.4	73.7	**74.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	94	202	436	939
LDN	88	190	410	883

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY Matthews Road
SEGMENT Palomar Road to Menifee Road
LOCATION: City of Menifee
SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	4,010
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	401

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	49.7	- -
MEDIUM TRUCKS=	4.00	49.6	- -
HEAVY TRUCKS =	8.01	49.7	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	63.5	61.5	60.2	54.1	62.6	63.2
MEDIUM TRUCKS	53.9	50.0	42.6	51.3	57.4	57.5
HEAVY TRUCKS	54.2	50.1	46.7	51.4	57.6	57.7
VEHICULAR NOISE	64.4	62.1	60.4	57.3	64.7	**65.1**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	24	51	109	235
LDN	22	48	102	221

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY Palomar Road
SEGMENT SR-74 to Matthews Road
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	6,604
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	12
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	660

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	49.7	- -
MEDIUM TRUCKS=	4.00	49.6	- -
HEAVY TRUCKS =	8.01	49.7	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	65.6	63.6	62.3	56.3	64.7	65.4
MEDIUM TRUCKS	56.1	52.2	44.7	53.4	59.6	59.6
HEAVY TRUCKS	56.3	52.3	48.9	53.6	59.8	59.8
VEHICULAR NOISE	66.5	64.2	62.6	59.4	66.8	**67.3**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	33	71	152	328
LDN	31	66	143	308

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY Menifee Road
SEGMENT Matthews Road to Rouse Road
LOCATION: City of Menifee
SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	12,423
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,242

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	69.0	67.0	65.7	59.7	68.1	68.7
MEDIUM TRUCKS	59.5	55.6	48.1	56.8	63.0	63.0
HEAVY TRUCKS	59.7	55.7	52.3	56.9	63.1	63.2
VEHICULAR NOISE	69.9	67.6	66.0	62.8	70.2	**70.7**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	55	119	257	553
LDN	52	112	241	518

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY Menifee Road
SEGMENT Rouse Road to Heritage Lake Drive
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	14,877
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,488

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	69.8	67.8	66.5	60.5	68.9	69.5
MEDIUM TRUCKS	60.3	56.4	48.9	57.6	63.8	63.8
HEAVY TRUCKS	60.5	56.5	53.1	57.7	63.9	64.0
VEHICULAR NOISE	70.7	68.4	66.8	63.6	71.0	**71.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	62	134	289	623
LDN	58	126	271	584

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: TTM 37405 Noise Impact Study
ROADWAY Menifee Road
SEGMENT Heritage Lake Dr to McCall Boulevard
LOCATION: City of Menifee SCENARIO: Existing + Project

JOB #: 0411-2018-01
DATE: 19-Jan-21
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	14,682
SPEED =	50
PK HR % =	10
NEAR LANE/FAR LANE DIST =	44
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	1,468

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

HTH WALL =	0 FT
AMBIENT =	0
BARRIER =	0 (0=WALL,1=BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	45.0	- -
MEDIUM TRUCKS=	4.00	44.9	- -
HEAVY TRUCKS =	8.01	45.0	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	69.8	67.7	66.4	60.4	68.8	69.5
MEDIUM TRUCKS	60.2	56.3	48.9	57.6	63.7	63.8
HEAVY TRUCKS	60.5	56.4	53.0	57.7	63.9	64.0
VEHICULAR NOISE	70.7	68.3	66.7	63.5	71.0	**71.4**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	62	133	287	618
LDN	58	125	269	579

Appendix C:

SoundPLAN Input and Output

Romola Farms
Octave spectra of the sources in dB(A) - Situation 1: Outdoor SP

Name	Source type	l or A	Li	R'w	L'w	Lw	KI	KT	LwMax	DO-Wall	Time histogram	Emission spectrum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m,m²	dB(A)	dB	dB(A)	dB(A)	dB	dB	dB(A)	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Entrance - Tunnel	Area	8.36	92.8	0.0	92.8	102.1	0.0	0.0		3	100%/24h	33_Transmissive area 02_	78.0	83.8	92.0	99.1	96.1	91.8	86.8	77.1	
Exit - Tunnel	Area	8.36	92.8	0.0	92.8	102.1	0.0	0.0		3	100%/24h	32_Transmissive area 01_	77.9	83.6	91.9	99.0	96.1	92.0	87.3	78.5	
Facade 01 - Tunnel	Area	65.39	93.7	57.0	44.0	62.2	0.0	0.0		3	100%/24h	18_Facade 01_	58.0	49.7	55.9	57.0	44.7	36.2	28.2	20.7	
Facade 02 - Tunnel	Area	13.98	93.3	57.0	43.5	55.0	0.0	0.0		3	100%/24h	19_Facade 02_	50.8	42.5	48.8	49.8	37.7	29.3	21.3	13.4	
Facade 03 - Tunnel	Area	65.39	93.7	57.0	44.0	62.2	0.0	0.0		3	100%/24h	20_Facade 03_	58.0	49.7	55.9	57.0	44.7	36.2	28.2	20.7	
Facade 04 - Tunnel	Area	13.98	93.9	57.0	44.0	55.5	0.0	0.0		3	100%/24h	21_Facade 04_	51.2	43.0	49.2	50.3	38.4	30.2	22.5	15.7	
Gas Canopy	Area	450.40			60.0	86.5	0.0	0.0		0	100%/24h					86.5					
Roof 01 - Tunnel	Area	72.13	93.6	57.0	43.9	62.4	0.0	0.0		0	100%/24h	16_Roof 01_	58.2	50.0	56.2	57.3	45.0	36.5	28.6	21.0	
Speaker	Point				75.0	75.0	0.0	0.0		0	100%/24h	Loud car radio				75.0					
Vac 1	Point				72.6	72.6	0.0	0.0		0	100%/24h	Vacutech	47.3	57.5	54.5	51.8	55.8	59.5	66.1	69.3	65.0
Vac 2	Point				72.6	72.6	0.0	0.0		0	100%/24h	Vacutech	47.3	57.5	54.5	51.8	55.8	59.5	66.1	69.3	65.0
Vac 3	Point				72.6	72.6	0.0	0.0		0	100%/24h	Vacutech	47.3	57.5	54.5	51.8	55.8	59.5	66.1	69.3	65.0
Vac 4	Point				72.6	72.6	0.0	0.0		0	100%/24h	Vacutech	47.3	57.5	54.5	51.8	55.8	59.5	66.1	69.3	65.0
Vac 5	Point				72.6	72.6	0.0	0.0		0	100%/24h	Vacutech	47.3	57.5	54.5	51.8	55.8	59.5	66.1	69.3	65.0
Vac 6	Point				72.6	72.6	0.0	0.0		0	100%/24h	Vacutech	47.3	57.5	54.5	51.8	55.8	59.5	66.1	69.3	65.0
Parking 2	PLot	208.66			55.8	79.0	0.0	0.0		0	100%/24h					79.0					
Parking 3	PLot	256.20			57.1	81.2	0.0	0.0		0	100%/24h					81.2					

Romola Farms
Input data parking lots - Situation 1: Outdoor SP

Parking lot	PLT	f	Unit B0	rence val	Sep.Mtd.	NRT	KPA dB	KI dB	KD dB	KStrO	he hist.
Parking 2	Housing estate	1.0	1 parking bay	12			0.0	4.0	1.2	0.0	-1
Parking 3	Housing estate	1.0	1 parking bay	16			0.0	4.0	2.1	0.0	-1

Romola Farms
Contribution level - Situation 1: Outdoor SP

Source	Source group	Source ty	Tr. lane	Leq,d dB(A)	A dB	
Receiver Receiver 1 Fl G Lr,lim dB(A) Leq,d 61.8 dB(A)						
Parking 2	Default parking lot noise	PLot		12.3	0.0	
Parking 3	Default parking lot noise	PLot		22.6	0.0	
Gas Canopy	Default industrial noise	Area		23.8	0.0	
Speaker	Default industrial noise	Point		22.9	0.0	
Vac 1	Default industrial noise	Point		18.6	0.0	
Vac 2	Default industrial noise	Point		19.0	0.0	
Vac 3	Default industrial noise	Point		19.5	0.0	
Vac 4	Default industrial noise	Point		20.0	0.0	
Vac 5	Default industrial noise	Point		22.4	0.0	
Vac 6	Default industrial noise	Point		23.0	0.0	
Roof 01 - Tunnel	Default industrial noise	Area		19.2	0.0	
Facade 01 - Tunnel	Default industrial noise	Area		22.2	0.0	
Facade 02 - Tunnel	Default industrial noise	Area		16.3	0.0	
Entrance - Tunnel	Default industrial noise	Area		61.7	0.0	
Facade 03 - Tunnel	Default industrial noise	Area		14.5	0.0	
Facade 04 - Tunnel	Default industrial noise	Area		8.1	0.0	
Exit - Tunnel	Default industrial noise	Area		43.4	0.0	
Receiver Receiver 2 Fl G Lr,lim dB(A) Leq,d 42.7 dB(A)						
Parking 2	Default parking lot noise	PLot		8.3	0.0	
Parking 3	Default parking lot noise	PLot		15.2	0.0	
Gas Canopy	Default industrial noise	Area		18.4	0.0	
Speaker	Default industrial noise	Point		11.2	0.0	
Vac 1	Default industrial noise	Point		6.6	0.0	
Vac 2	Default industrial noise	Point		6.8	0.0	
Vac 3	Default industrial noise	Point		7.0	0.0	
Vac 4	Default industrial noise	Point		7.2	0.0	
Vac 5	Default industrial noise	Point		7.4	0.0	
Vac 6	Default industrial noise	Point		7.6	0.0	
Roof 01 - Tunnel	Default industrial noise	Area		1.8	0.0	
Facade 01 - Tunnel	Default industrial noise	Area		5.3	0.0	
Facade 02 - Tunnel	Default industrial noise	Area		0.4	0.0	
Entrance - Tunnel	Default industrial noise	Area		42.5	0.0	
Facade 03 - Tunnel	Default industrial noise	Area		-1.2	0.0	
Facade 04 - Tunnel	Default industrial noise	Area		-7.4	0.0	
Exit - Tunnel	Default industrial noise	Area		25.8	0.0	
Receiver Receiver 3 Fl G Lr,lim dB(A) Leq,d 39.1 dB(A)						
Parking 2	Default parking lot noise	PLot		10.3	0.0	
Parking 3	Default parking lot noise	PLot		17.5	0.0	
Gas Canopy	Default industrial noise	Area		19.8	0.0	
Speaker	Default industrial noise	Point		11.5	0.0	
Vac 1	Default industrial noise	Point		0.0	0.0	
Vac 2	Default industrial noise	Point		0.1	0.0	
Vac 3	Default industrial noise	Point		0.2	0.0	

Source	Source group	Source ty	Tr. lane	Leq,d dB(A)	A dB	
Vac 4	Default industrial noise	Point		0.3	0.0	
Vac 5	Default industrial noise	Point		0.4	0.0	
Vac 6	Default industrial noise	Point		0.5	0.0	
Roof 01 - Tunnel	Default industrial noise	Area		-1.0	0.0	
Facade 01 - Tunnel	Default industrial noise	Area		2.0	0.0	
Facade 02 - Tunnel	Default industrial noise	Area		-2.6	0.0	
Entrance - Tunnel	Default industrial noise	Area		38.9	0.0	
Facade 03 - Tunnel	Default industrial noise	Area		4.3	0.0	
Facade 04 - Tunnel	Default industrial noise	Area		-10.2	0.0	
Exit - Tunnel	Default industrial noise	Area		22.5	0.0	

Romola Farms
Contribution spectra - Situation 1: Outdoor SP

Source	Time slice	Sum	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz	6.3kHz	8kHz	10kHz	12.5kHz	16kHz	
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
Receiver Receiver 1 Fl G Lr,lim dB(A) Leq,d 61.8 dB(A)																													
Entrance - Tunnel	Leq,d	61.7		40.1			43.7			51.9			58.7			56.0			51.2			44.8			31.3				
Exit - Tunnel	Leq,d	43.4		30.9			31.8			36.6			39.9			34.8			30.8			25.2			13.2				
Facade 01 - Tunnel	Leq,d	22.2		19.6			9.0			14.5			15.4			3.7			-4.9			-13.5			-22.7				
Facade 02 - Tunnel	Leq,d	16.3		13.5			2.9			9.0			10.0			-1.4			-9.9			-18.6			-28.4				
Facade 03 - Tunnel	Leq,d	14.5		13.5			1.5			4.4			2.2			-12.4			-22.6			-32.1			-42.9				
Facade 04 - Tunnel	Leq,d	8.1		7.0			-5.7			-1.5			-3.2			-17.2			-28.1			-38.1			-48.5				
Gas Canopy	Leq,d	23.8											23.8																
Roof 01 - Tunnel	Leq,d	19.2		16.2			5.2			12.0			13.0			1.2			-8.1			-17.9			-29.4				
Speaker	Leq,d	22.9											22.9																
Vac 1	Leq,d	18.6	-13.8	-6.6	0.6	1.9	4.9	6.1	1.1	0.7	0.1	-2.1	-3.8	-1.7	-1.6	-0.6	2.6	4.7	4.9	2.8	9.0	10.0	9.8	9.6	8.0	2.3	-3.0	-11.5	
Vac 2	Leq,d	19.0	-13.2	-6.0	1.2	2.5	5.5	6.8	1.7	1.3	0.7	-1.5	-3.2	-1.1	-1.0	0.0	3.2	5.2	5.4	3.3	9.4	10.4	9.8	9.7	8.3	2.9	-2.1	-10.2	
Vac 3	Leq,d	19.5	-12.5	-5.3	1.9	3.2	6.2	7.5	2.3	1.9	1.3	-0.9	-2.5	-0.5	-0.4	0.5	3.7	5.7	5.9	3.8	9.8	10.8	10.3	10.2	8.9	3.7	-1.0	-8.8	
Vac 4	Leq,d	20.0	-11.8	-4.6	2.6	3.9	7.0	8.2	3.0	2.6	2.0	-0.2	-1.9	0.1	0.2	1.1	4.3	6.2	6.4	4.3	10.2	11.2	10.7	10.7	9.5	4.5	0.0	-7.4	
Vac 5	Leq,d	22.4	-11.0	-3.8	5.7	7.0	10.1	11.3	6.1	5.4	4.9	2.7	0.9	3.0	3.1	4.0	7.1	9.1	9.3	7.2	11.8	12.9	12.4	12.7	11.7	7.1	3.0	-4.0	
Vac 6	Leq,d	23.0	-10.2	-0.7	6.4	7.8	10.8	12.0	6.9	6.1	5.5	3.3	1.6	3.6	3.7	4.6	7.7	9.7	9.8	7.7	12.3	13.4	13.0	13.3	12.4	7.9	4.1	-2.6	
Parking 2	Leq,d	12.3											12.3																
Parking 3	Leq,d	22.6											22.6																
Receiver Receiver 2 Fl G Lr,lim dB(A) Leq,d 42.7 dB(A)																													
Entrance - Tunnel	Leq,d	42.5		26.8			28.0			31.3			39.3			37.5			31.3			20.2			-9.5				
Exit - Tunnel	Leq,d	25.8		16.6			14.9			17.0			21.7			19.1			13.7			3.7			-24.2				
Facade 01 - Tunnel	Leq,d	5.3		4.2			-8.7			-7.2			-4.7			-14.2			-23.2			-36.2			-61.5				
Facade 02 - Tunnel	Leq,d	0.4		-1.0			-13.6			-10.5			-8.6			-19.9			-30.0			-43.5			-70.2				
Facade 03 - Tunnel	Leq,d	-1.2		-1.9			-16.5			-13.2			-14.4			-28.2			-39.5			-53.6			-80.3				
Facade 04 - Tunnel	Leq,d	-7.4		-7.9			-22.6			-20.5			-21.4			-34.2			-45.4			-59.7			-86.2				
Gas Canopy	Leq,d	18.4											18.4																
Roof 01 - Tunnel	Leq,d	1.8		-0.5			-12.3			-6.3			-5.4			-17.1			-26.7			-39.2			-65.2				
Speaker	Leq,d	11.2											11.2																
Vac 1	Leq,d	6.6	-21.1	-13.8	-6.6	-7.8	-4.7	-3.4	-15.4	-16.1	-16.5	-20.5	-22.1	-19.9	-11.8	-10.7	-7.4	-3.2	-3.1	-5.5	-1.7	-2.3	-5.5	-9.9	-18.0	-33.5	-53.0	-80.8	
Vac 2	Leq,d	6.8	-20.9	-13.7	-6.5	-7.6	-4.5	-3.3	-15.3	-15.9	-16.4	-20.3	-21.9	-19.7	-11.6	-10.5	-7.2	-3.0	-2.9	-5.3	-1.5	-2.1	-5.2	-9.4	-17.4	-32.7	-51.9	-79.3	
Vac 3	Leq,d	7.0	-20.8	-13.5	-6.3	-7.4	-4.4	-3.1	-15.1	-15.8	-16.2	-20.2	-21.8	-19.6	-11.5	-10.4	-7.0	-2.8	-2.7	-5.2	-1.3	-1.8	-4.9	-9.0	-16.9	-31.9	-50.9	-77.8	
Vac 4	Leq,d	7.2	-20.7	-13.4	-6.2	-7.3	-4.2	-2.9	-15.0	-15.6	-16.1	-20.0	-21.6	-19.4	-11.3	-10.2	-6.9	-2.7	-2.5	-5.0	-1.1	-1.6	-4.6	-8.6	-16.3	-31.1	-49.8	-76.4	
Vac 5	Leq,d	7.4	-20.5	-13.3	-6.1	-7.1	-4.0	-2.8	-14.8	-15.5	-15.9	-19.9	-21.4	-19.2	-11.2	-10.1	-6.7	-2.5	-2.4	-4.8	-0.8	-1.3	-4.2	-8.2	-15.7	-30.4	-48.7	-74.9	
Vac 6	Leq,d	7.6	-20.4	-13.1	-5.9	-6.9	-3.9	-2.6	-14.7	-15.3	-15.8	-19.7	-21.3	-19.1	-11.0	-9.9	-6.6	-2.4	-2.2	-4.6	-0.6	-1.1	-3.9	-7.7	-15.1	-29.6	-47.6	-73.4	
Parking 2	Leq,d	8.3											8.3																
Parking 3	Leq,d	15.2											15.2																

Romola Farms
Contribution spectra - Situation 1: Outdoor SP

Source	Time slice	Sum	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz	6.3kHz	8kHz	10kHz	12.5kHz	16kHz	
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
Receiver Receiver 3 Fl G Lr,lim dB(A) Leq,d 39.1 dB(A)																													
Entrance - Tunnel	Leq,d	38.9		23.9			24.1			28.0			35.8			33.6			27.2			13.8			-22.9				
Exit - Tunnel	Leq,d	22.5		13.6			11.2			13.8			18.4			15.7			9.8			-2.8			-38.3				
Facade 01 - Tunnel	Leq,d	2.0		1.2			-12.8			-11.2			-9.3			-19.9			-31.0			-48.0			-83.4				
Facade 02 - Tunnel	Leq,d	-2.6		-3.7			-17.4			-13.7			-12.3			-23.5			-33.8			-49.5			-83.3				
Facade 03 - Tunnel	Leq,d	4.3		3.3			-10.6			-7.5			-5.6			-17.3			-28.0			-44.0			-78.5				
Facade 04 - Tunnel	Leq,d	-10.2		-10.7			-26.1			-23.7			-24.6			-37.4			-49.2			-65.9							
Gas Canopy	Leq,d	19.8											19.8																
Roof 01 - Tunnel	Leq,d	-1.0		-2.9			-15.5			-9.5			-8.7			-20.2			-30.2			-45.1			-78.2				
Speaker	Leq,d	11.5											11.5																
Vac 1	Leq,d	0.0	-25.3	-18.1	-11.0	-13.0	-10.0	-8.8	-18.4	-19.1	-19.6	-23.6	-25.2	-23.0	-16.6	-15.7	-12.7	-9.4	-9.7	-12.9	-10.0	-12.1	-17.2	-24.5	-36.9	-58.4	-86.1		
Vac 2	Leq,d	0.1	-25.2	-18.0	-10.9	-12.9	-9.9	-8.7	-18.3	-19.0	-19.5	-23.5	-25.1	-22.9	-16.5	-15.6	-12.6	-9.3	-9.6	-12.8	-9.9	-11.9	-17.0	-24.2	-36.4	-57.7	-85.1		
Vac 3	Leq,d	0.2	-25.2	-17.9	-10.8	-12.8	-9.8	-8.6	-18.2	-18.9	-19.4	-23.4	-25.0	-22.8	-16.5	-15.6	-12.5	-9.2	-9.5	-12.7	-9.8	-11.7	-16.7	-23.8	-35.8	-56.9	-84.0		
Vac 4	Leq,d	0.3	-25.1	-17.8	-10.7	-12.7	-9.6	-8.5	-18.1	-18.8	-19.3	-23.3	-24.9	-22.7	-16.4	-15.5	-12.5	-9.1	-9.5	-12.6	-9.7	-11.6	-16.6	-23.5	-35.4	-56.2	-83.0		
Vac 5	Leq,d	0.4	-25.0	-17.7	-10.6	-12.5	-9.5	-8.3	-18.0	-18.7	-19.2	-23.2	-24.8	-22.6	-16.3	-15.4	-12.4	-9.0	-9.4	-12.5	-9.5	-11.3	-16.2	-23.1	-34.8	-55.4	-81.8		
Vac 6	Leq,d	0.5	-24.9	-17.7	-10.5	-12.4	-9.4	-8.2	-17.9	-18.6	-19.1	-23.1	-24.7	-22.5	-16.2	-15.3	-12.3	-8.9	-9.2	-12.3	-9.3	-11.1	-15.9	-22.6	-34.1	-54.4	-80.5		
Parking 2	Leq,d	10.3											10.3																
Parking 3	Leq,d	17.5											17.5																

Romola Farms
Octave spectra of the sources in dB(A) - Situation 2: Outdoor SP

Name	Source type	l or A m,m²	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	KI dB	KT dB	LwMax dB(A)	DO-Wall dB	Time histogram	Emission spectrum	500Hz dB(A)	
Gas Canopy	Area	450.40			60.0	86.5	0.0	0.0		0	100%/24h		86.5	
Speaker	Point				75.0	75.0	0.0	0.0		0	100%/24h	Loud car radio	75.0	
Parking 2	PLot	208.66			55.8	79.0	0.0	0.0		0	100%/24h		79.0	
Parking 3	PLot	256.20			57.1	81.2	0.0	0.0		0	100%/24h		81.2	

Romola Farms
Input data parking lots - Situation 2: Outdoor SP

Parking lot	PLT	f	Unit B0	rence val	Sep.Mtd.	NRT	KPA dB	KI dB	KD dB	KStrO	ne hist.
Parking 2	Housing estate	1.0	1 parking bay	12			0.0	4.0	1.2	0.0	-1
Parking 3	Housing estate	1.0	1 parking bay	16			0.0	4.0	2.1	0.0	-1

Romola Farms
Contribution level - Situation 2: Outdoor SP

Source	Source group	Source ty	Tr. lane	Leq,d dB(A)	A dB	
Receiver Receiver 1 Fl G Lr,lim dB(A) Leq,d 28.9 dB(A)						
Parking 2	Default parking lot noise	PLot		12.5	0.0	
Parking 3	Default parking lot noise	PLot		22.6	0.0	
Gas Canopy	Default industrial noise	Area		24.0	0.0	
Speaker	Default industrial noise	Point		25.2	0.0	
Receiver Receiver 2 Fl G Lr,lim dB(A) Leq,d 20.8 dB(A)						
Parking 2	Default parking lot noise	PLot		8.3	0.0	
Parking 3	Default parking lot noise	PLot		15.2	0.0	
Gas Canopy	Default industrial noise	Area		18.4	0.0	
Speaker	Default industrial noise	Point		11.2	0.0	
Receiver Receiver 3 Fl G Lr,lim dB(A) Leq,d 22.5 dB(A)						
Parking 2	Default parking lot noise	PLot		10.3	0.0	
Parking 3	Default parking lot noise	PLot		17.5	0.0	
Gas Canopy	Default industrial noise	Area		19.8	0.0	
Speaker	Default industrial noise	Point		11.5	0.0	

Romola Farms
Contribution spectra - Situation 2: Outdoor SP

Source	Time slice	Sum dB(A)	400Hz dB(A)	500Hz dB(A)	630Hz dB(A)
Receiver Receiver 1 Fl G Lr,lim dB(A) Leq,d 28.9 dB(A)					
Gas Canopy	Leq,d	24.0	19.2	19.2	19.2
Speaker	Leq,d	25.2	20.4	20.4	20.4
Parking 2	Leq,d	12.5	7.7	7.7	7.7
Parking 3	Leq,d	22.6	17.8	17.8	17.8
Receiver Receiver 2 Fl G Lr,lim dB(A) Leq,d 20.8 dB(A)					
Gas Canopy	Leq,d	18.4	13.6	13.6	13.6
Speaker	Leq,d	11.2	6.4	6.4	6.4
Parking 2	Leq,d	8.3	3.5	3.5	3.5
Parking 3	Leq,d	15.2	10.4	10.4	10.4
Receiver Receiver 3 Fl G Lr,lim dB(A) Leq,d 22.5 dB(A)					
Gas Canopy	Leq,d	19.8	15.0	15.0	15.0
Speaker	Leq,d	11.5	6.7	6.7	6.7
Parking 2	Leq,d	10.3	5.5	5.5	5.5
Parking 3	Leq,d	17.5	12.8	12.8	12.8

Appendix D:

Construction Noise Modeling Output

Activity	L_{eq} at 1,000 feet dBA	L_{Max} at 1,000 feet dBA
Grading	58	60
Building Construction	53	55
Paving	54	56

Equipment Summary	Reference (dBA) 50 ft Lmax
Rock Drills	96
Jack Hammers	82
Pneumatic Tools	85
Pavers	80
Dozers	85
Scrappers	87
Haul Trucks	88
Cranes	82
Portable Generators	80
Rollers	80
Tractors	80
Front-End Loaders	86
Hydraulic Excavators	86
Graders	86
Air Compressors	86
Trucks	86

Grading

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Leq	Energy
1	Grader	86	1	40	50	0.5	0	86.0	82.0	159242868
2	Dozer	85	1	40	50	0.5	0	85.0	81.0	126491106
3	Excavator	86	2	40	50	0.5	0	89.0	85.0	318485736
4	Tractor/Backhoe	80	2	40	50	0.5	0	83.0	79.0	80000000
5	Scrapper	87	2	40	50	0.5	0	90.0	86.0	400949787
							Lmax*	**92**	**Leq**	**90**
							Lw	**124**	**Lw**	**122**

Source: MD Acoustics, Oct 2018.

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

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA	1 dBA Shielding Leq dBA	2 dBA Shielding Leq dBA	3 dBA Shielding Leq dBA	4 dBA Shielding Leq dBA	5 dBA Shielding Leq dBA	6 dBA Shielding Leq dBA	7 dBA Shielding Leq dBA	8 dBA Shielding Leq dBA	9 dBA Shielding Leq dBA	10 dBA Shielding Leq dBA	11 dBA Shielding LeqdBA	12 dBA Shielding Leq dBA	13 dBA Shielding Leq dBA	14 dBA Shielding Leq dBA	15 dBA Shielding Leq dBA
50	15.2	0.5	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75
100	30.5	0.5	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68
200	61.0	0.5	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60
400	121.9	0.5	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53
500	152.4	0.5	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50
600	182.9	0.5	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
700	213.3	0.5	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47
800	243.8	0.5	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45
900	274.3	0.5	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44
1000	**304.8**	**0.5**	**58**	**57**	**56**	**55**	**54**	**53**	**52**	**51**	**50**	**49**	**48**	**47**	**46**	**45**	**44**	**43**

Building Construction

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Calculated (dBA) Leq	Energy
1	Cranes	82	1	40	50	0.5	0	82.0	78.0	63395727.7
2	Forklift/Tractor	80	3	40	50	0.5	0	84.8	80.8	120000000
3	Generator	80	1	40	50	0.5	0	80.0	76.0	40000000
4	Tractor/Backhoe	80	3	40	50	0.5	0	84.8	80.8	120000000
							Lmax*	**87**	**Leq**	**85**
							Lw	**118**	**Lw**	**117**

Source: MD Acoustics, Oct 2018.

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

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA	1 dBA Shielding Leq dBA	2 dBA Shielding Leq dBA	3 dBA Shielding Leq dBA	4 dBA Shielding Leq dBA	5 dBA Shielding Leq dBA	6 dBA Shielding Leq dBA	7 dBA Shielding Leq dBA	8 dBA Shielding Leq dBA	9 dBA Shielding Leq dBA	10 dBA Shielding Leq dBA	11 dBA Shielding LeqdBA	12 dBA Shielding Leq dBA	13 dBA Shielding Leq dBA	14 dBA Shielding Leq dBA	15 dBA Shielding Leq dBA
50	15.2	0.5	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70
100	30.5	0.5	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63
200	61.0	0.5	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55
400	121.9	0.5	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
500	152.4	0.5	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45
600	182.9	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
700	213.3	0.5	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
800	243.8	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
900	274.3	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
1000	**304.8**	**0.5**	**53**	**52**	**51**	**50**	**49**	**48**	**47**	**46**	**45**	**44**	**43**	**42**	**41**	**40**	**39**	**38**

Paving

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Leq	Energy
1	Pavers	86	2	40	50	0.5	0	89.0	85.0	318485736
2	Rollers	80	2	40	50	0.5	0	83.0	79.0	80000000
3	Paving Equipment	80	2	40	50	0.5	0	83.0	79.0	80000000
							Lmax*	**90**	**Leq**	**87**
							Lw	**122**	**Lw**	**118**

Source: MD Acoustics, Oct 2018.

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

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA	1 dBA Shielding Leq dBA	2 dBA Shielding Leq dBA	3 dBA Shielding Leq dBA	4 dBA Shielding Leq dBA	5 dBA Shielding Leq dBA	6 dBA Shielding Leq dBA	7 dBA Shielding Leq dBA	8 dBA Shielding Leq dBA	9 dBA Shielding Leq dBA	10 dBA Shielding Leq dBA	11 dBA Shielding LeqdBA	12 dBA Shielding Leq dBA	13 dBA Shielding Leq dBA	14 dBA Shielding Leq dBA	15 dBA Shielding Leq dBA
50	15.2	0.5	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72
100	30.5	0.5	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
200	61.0	0.5	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57
400	121.9	0.5	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
500	152.4	0.5	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47
600	182.9	0.5	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45
700	213.3	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
800	243.8	0.5	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
900	274.3	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
1000	**304.8**	**0.5**	**54**	**53**	**52**	**51**	**50**	**49**	**48**	**47**	**46**	**45**	**44**	**43**	**42**	**41**	**40**	**39**

VIBRATION LEVEL IMPACT

Project:	Motte Farm Car Wash Development	Date: 10/31/18
Source:	Large Bulldozer	
Scenario:	Unmitigated	
Location:	Project Site	
Address:	Residences to West	

PPV = PPVref(25/D)^n (in/sec)

DATA INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN BLUE
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	1,000.00	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 =	**0.002**	IN/SEC	OUTPUT IN RED