414 East Grand Avenue – Arroyo Grande

Noise Impact Study

City of Arroyo Grande, CA

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1.0 Executive Summary

This report has been prepared to provide the calculated noise projections from the proposed car wash project located at 414 East Grand Avenue in the City of Arroyo Grande, CA. All calculations are compared to the City of Arroyo Grande's noise ordinance as well as the existing ambient condition. The project proposes to construct an 80-foot covered car wash tunnel with 12 vacuum stalls on approximately 0.47 acres of mixed-use zoned lot. Land uses surrounding the site include residential to the north and northwest, commercial to the east, agriculture to the south (across Grand Avenue), and commercial and residential uses to the west.

1.1 Findings and Conclusions

Three (3) short-term baseline ambient measurement was performed at the project site to determine the ambient noise condition within the project vicinity. Ambient noise data indicates that the noise level in the area is 60 to 70 dBA Leq. The predominant source of noise impacting the existing uses is traffic noise propagating from East Grand Avenue.

This study compares the project's operational plus ambient noise levels to the ambient conditions. The project only operational noise levels range from 43 to 50 dBA at the adjacent residential locations.

The operational noise will not increase the ambient noise level and will therefore not exceed the City's residential daytime noise limit.

The following outlines the project design features:

1. The project shall incorporate a 120 HP International Dryer Company Predator system or equivalent to meet the acoustical benchmarks. Any modification of the dryer equipment would require a re-evaluation. The reference equipment sound level data is provided in Appendix C.

2. The project's exit will be 10'x10' or smaller.

3. The project will incorporate a 6' wall at the north property lines.

4. An acoustic liner (Acoustiblok perforated metal panels or equivalent) will line 16' of the south wall near the exit (see Appendix C).

2.0 Introduction

2.1 Purpose of Analysis and Study Objectives

The purpose of this noise impact study is 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 California Environmental Quality Act (CEQA), a significant impact related to noise would occur if a proposed project is determined to result in:

- Exposure of persons to or generation of noise levels above standards established in the local General Plan or noise ordinance, or applicable agencies.
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

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 evaluation of the existing ambient noise environment
- An analysis of stationary noise impacts from the project site to adjacent land uses

2.2 Site Location and Study Area

The project site is located at 414 East Grand Avenue in the City of Arroyo Grande, CA as shown in Exhibit A. Land uses directly surrounding the project include mixed-uses to the north and east, agriculture to the south, and single-family residential uses to the west.

2.3 Proposed Project Description

The project proposes to develop an 80-foot covered car wash tunnel and 12 vacuum stalls. The site plan used for this is illustrated in Exhibit B. The project is assumed to operate during daytime hours.

Exhibit A

Location Map

Exhibit B

Site Plan

3.0 Fundamentals of Noise

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

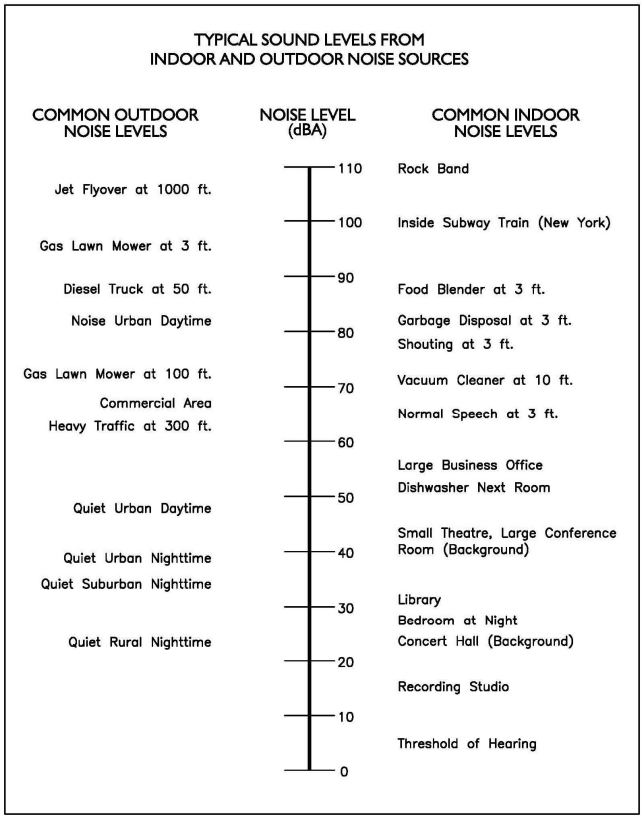
3.1 Sound, Noise, and Acoustics

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.

3.2 Frequency and Hertz

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

Exhibit C: Typical A-Weighted Noise Levels



3.3 Sound Pressure Levels and Decibels

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

3.4 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.

3.5 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 a change in the noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

3.6 Noise Descriptors

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

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

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

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

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

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

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

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

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

Noise: *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.

3.7 Traffic Noise Prediction

Noise levels associated with traffic depend on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2 axle), and heavy truck percentage (3 axle and greater), and (4) sound propagation. The greater the volume of traffic, the 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.

3.8 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 or more from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

4.0 Ground-Borne Vibration Fundamentals

4.1 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.

4.2 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.

4.3 Vibration Propagation

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

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

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

5.0 Regulatory Setting

The proposed project is located in the City of Arroyo Grande, California, 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.

5.1 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 for regulating noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible for regulating 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 Housing and Urban Development (HUD) is responsible for establishing noise regulations as it relates to exterior/interior noise levels for new HUD-assisted housing developments near high noise areas.

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

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

5.2 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 the compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise

levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable as illustrated in Exhibit D.

5.3 City of Arroyo Grande Noise Regulations

The City of Arroyo Grande outlines their noise regulations and standards within the Noise Element from the General Plan and Chapter 9.16.040 from the Municipal Code.

City of Arroyo Grande Noise Element

Figure N-1 (Exhibit D), Land Use Compatibility for Community Noise Exposure, reveals the noise acceptability levels for different land uses.

Exhibit D: Land Use Compatibility Guidelines

FIGURE N-1
LAND USE COMPATIBILITY FOR NEW DEVELOPMENT
NEAR TRANSPORTATION NOISE SOURCES

LAND USE	COMMUNITY NOISE EXPOSURE LDN OR CNEL, dB						
	50	55	60	65	70	75	80
RESIDENTIAL, THEATERS, AUDITORIUMS, MUSIC HALLS	AAAA	AAAA	CCCC	CCCC	UUUU	UUUU	UUUU
TRANSIENT LODGING-MOTELS, HOTELS, B & B's, RV PARKS & CAMPGROUNDS	AAAA	AAAA	CCCC	CCCC	CCCC	UUUU	UUUU
SCHOOLS, LIBRARIES, MUSEUMS, HOSPITALS, NURSING HOMES, MEETING HALLS, CHURCHES, PRE-SCHOOL, CHILD CARE FACILITIES	AAAA	AAAA	CCCC	CCCC	CCCC	UUUU	UUUU
PLAYGROUNDS, PARKS	AAAA	AAAA	AAAA	AAAA	CCCC	UUUU	UUUU
OFFICES	AAAA	AAAA	CCCC	CCCC	CCCC	UUUU	UUUU

INTERPRETATION

AAAA = ACCEPTABLE
Specified land use is satisfactory. No noise mitigation measures are required.

CCCC = CONDITIONALLY ACCEPTABLE
Use should be permitted only after careful study & inclusion of protective Measures as needed to satisfy the policies of the Noise Element.

UUUU = UNACCEPTABLE
Development is usually not feasible in accordance with the goals of the Noise Element

- **Goals, Policies, and Implementation Measures**

Policies, goals and implementation program measures from the Noise Element that would mitigate potential impacts on noise include the following.

N4. To educate the residents of Arroyo Grande concerning the methods available for minimizing exposure to excessive noise.

N5. To avoid or reduce noise impacts through site planning and project design, giving second preference to the use of noise barriers and/or structural modifications to buildings containing noise-sensitive land uses.

Policy N4&5-1 The City should require noise mitigation measures where existing noise levels produce significant noise impacts to noise-sensitive land uses or where new developments may result in cumulative increases of noise upon noise-sensitive land uses.

Policy N4&5-2 New Public and private development proposals shall be reviewed to determine conformance with the policies of this Noise Element.

When Mitigation must be applied to satisfy the policies of the Noise Element the following priorities for mitigation shall be observed, where feasible:

First: Setbacks/open space separation
Second: Site layout/orientation/shielding of noise-sensitive uses with non-noise-sensitive uses
Third: Construction of earthen berms
Fourth: Structural measures: acoustical treatment of buildings and noise barriers constructed of concrete, wood, or materials other than earth

Policy N4&5-3 Where the development of a project subject to discretionary approval may result in land uses being exposed to existing or projected future noise levels exceeding the levels specified by the policies in the Noise Element, the City shall require an acoustical analysis as part of the environmental review under CEQA at the time the application is accepted for processing. For development not subject to discretionary approval and/or environmental review, the requirements for an acoustical analysis shall be implemented prior to the issuance of a building permit.

Policy N4&5-3.1 At the Discretion of the City, the requirement for an acoustical analysis may be waived provided that all of the following conditions are met:

Outdoor Activity Areas

a) The development is for less than five single-family dwellings or for office buildings, churches or meeting halls having a total gross floor area less than 10,000 square feet.
b) The noise source in question consists of a single roadway or railway for which up-to-date noise exposure information is available. An acoustical analysis will be required when the noise source in question is a stationary noise source, or when the noise source consists of multiple transportation noise sources.
c) The existing or projected future noise exposure at the exterior of buildings which will contain noise-sensitive uses or within proposed outdoor activity areas (other than playgrounds and parks) does not exceed 65 dB Ldn (or CNEL) prior to mitigation. For playgrounds and parks, the existing or projected future noise exposure may not

exceed 75 dB Ldn (or CNEL) prior to mitigation.

d) The topography in the project area is flat and the noise source and receiving land use are at the same grade.

N4&5-3.2 Interior Spaces

a) Required Noise Level Reduction (NLR) is equal to or less than 30 dB.
b) The development is for less than five single-family dwellings or for offices, churches, meeting halls with less than 10,000 sq ft floor area.
c) Noise source in question consists of a single roadway for which up-to-date noise exposure information is available. An acoustical analysis will be required when the noise source is a stationary noise source or consists of multiple transportation noise sources.

N4&5-3.3 General

Effective Noise mitigation, as determined by the City is incorporated into the project design to reduce noise exposure to the levels specified in Tables N-1 or N-2. Such measures may include the use of building setbacks, building orientation, noise barriers and the standard noise mitigation packages contained within the Acoustical Design Manual. If Closed windows are required for compliance with interior noise level standards, air conditioning or a mechanical ventilation system will be required.

N1-2 Where mitigation of existing noise levels in accordance with the policies and standards of this Noise Element is not feasible, the City Council may reduce or waive the applicable policies and standards to the degree needed to allow reasonable use of property, provided noise levels are mitigated to the maximum extent possible.

N1-3 Where the mitigation of noise levels from a proposed development project in accordance with policies and standards of this element cannot be achieved, the City Council may require a reduction in proposed uses relative to size, scale, and intensity. If excessive noise levels cannot be mitigated, the project shall be denied. In instances where mitigation measures will reasonably reduce noise levels near the required standard, the City Council may be flexible in its evaluation of Policies and Standards. This shall be done on a case-by-case basis.

N2-1 Procedures shall be developed and employed to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the development review and building permit processes.

N2-3 The City shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code (UBC).

N2-4 The City shall request the California Highway Patrol, the County Sheriff and City police department to actively enforce the California Vehicle Code sections relating to adequate vehicle mufflers and modified exhaust systems.

N3-1 The City shall purchase new equipment and vehicles only if they comply with noise level performance standards based upon the best available noise reduction technology. Alternatives to the use of existing noisy equipment, such as leaf blowers, shall be pursued.

N3-2 The City shall periodically review and update the Noise Element to ensure that noise exposure information and specific policies are consistent with changing conditions within the City and with noise control regulations or policies enacted after the adoption of this element.

N4-1 The City shall make the Acoustical Design Manual available to the public so that the public can incorporate noise reduction measures into private projects consistent with the goals and policies of this Noise Element.

N5-1 The City shall consider one or more of the following mitigation measures where existing noise levels significantly impact existing noise-sensitive land uses or where cumulative increase in noise levels resulting from new development significantly impact noise-sensitive land uses:

a) Rerouting traffic onto streets that have low traffic volumes or onto streets that do not adjoin noise-sensitive land uses.
b) Rerouting trucks onto streets that do not adjoin noise-sensitive land uses.
c) Construction of noise barriers.
d) Lowering speed limits.
e) Acoustical treatment of buildings
f) Programs to pay for noise mitigation such as low cos loans to owners of noise-impacted property or establishment of developer fees.

N5-2 The City Shall consider adoption of a noise ordinance that provides guidelines under which intrusive noise sources would be regulated.

City of Arroyo Grande – Municipal Code

Section 9.16.040 of the City's Municipal Code outlines the City's noise ordinance.

Section 9.16.040 – Exterior Noise Level Standards

A. The exterior noise level standards of this section are applicable when a land use affected by noise is one of the following noise-sensitive use:

1. Residential development
2. Schools, preschools, child care facilities;
3. Hospitals, nursing homes;
4. Churches;
5. Meeting halls, auditoriums, music halls, theaters, libraries, museums;
6. Transient lodging, motels, hotels, bed and breakfast inns, recreational vehicle parks and campgrounds;
7. Playgrounds, parks; and
8. Offices.

No person shall create any noise or allow the creation of any noise at any location within the city on property owned, leased, occupied or otherwise controlled by such person which causes the exterior noise level when measured at any of the preceding noise sensitive land uses to exceed the noise level standards in the following table. When the receiving noise-sensitive land use are playgrounds or parks, the following noise level standards shall be increased by ten (10) dB

Table 1: Exterior Noise Level Standards

	Daytime (7am to 10pm)	Nighttime (10pm to 7am)[1]
Hourly Equivalent Sound Level (Leq, dB)	**50**	**45**
Maximum Level dB	**70**	**65**
1.Applies only to uses that operate or are occupied during nighttime hours.		

B. In the event the measured ambient noise level exceeds the applicable exterior noise level standard in subsection B of this section, applicable standard shall be adjusted so as to equal the ambient noise level.
C. Each of the exterior noise level standards specified in Subsection B of this section shall be reduced five dB for simple tone noises, noises consisting primarily of speech or music, or four recurring impulsive noises.
D. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the exterior noise level standards.

Section 9.16.030 – Exceptions to noise standards

The standards of this chapter are not applicable to noise from the following sources:

A. Activities conducted in public parks, public playgrounds and public or private school grounds, including but not limited to school athletic and school entertainment events;
B. The use of any mechanical device, apparatus or equipment related to or connected with emergency activities or emergency work to protect life or property;
C. Safety signals, warning devices, and emergency pressure relief valves;
D. Noise sources associated with construction, provided such activities do not take place before seven a.m. or after ten (10) p.m. or any day except Saturday or Sunday, or before eight a.m. or after five p.m. on Saturday or Sunday;
E. Noise sources associated with the routine maintenance of a residential, commercial, industrial, or public/quasi-public property provided that such maintenance activities take place between the hours of seven a.m. and ten (10)p.m.;
F. Noise sources associated with agricultural land uses, including but not limited to wind machines used for direct climate control, water well pumps and pest-repelling devices, provided that such past-repelling devices are used in accordance with the accepted standards and practices;
G. Noise sources associated with work performed by the city or private or public utilities in the maintenance of modification of its facilities;
H. Noise sources associated with the collection of waste or garbage from property devoted to other than residential uses;
I. Any activity to the extent regulation thereof has been preempted by state or federal law.

6.0 Study Method and Procedure

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

6.1 Noise Measurement Procedure and Criteria

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

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

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

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

6.2 Long-Term Noise Measurement Locations

Three (3) short-term 15-minute noise measurements were conducted at or near the project site. Exhibit E illustrates the measurement locations. Appendix A includes photos, field sheet, and measured noise data.

6.3 Stationary Noise Modeling

SoundPLAN (SP) acoustical modeling software was utilized to model future worst-case stationary noise impacts to the adjacent land uses. SP can evaluate multiple stationary noise source impacts at various receiver locations. SP’s software utilizes algorithms (based on the inverse square law and reference equipment noise level data) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations.

The future worst-case noise level projections were modeled using reference sound level data for the various stationery on-site sources (e.g., car wash equipment). The model assumes that the car wash tunnel is approximately 80 feet long. The model assumes that the exit tunnel opening is approximately 10 feet wide by 10 feet tall with 12 vacuum stalls. SoundPLAN inputs and outputs are provided in Appendix B.

The blowers (a 120 HP International Dryer Company Predator blower system or equivalent) were modeled at 10 to 12 feet high as a point source. It is anticipated that blowers will be located inside approximately 5 feet from the exit of the tunnel. The reference equipment sound level data and acoustic liner material specs are provided in Appendix C.

In addition, MD performed reference noise level measurements on Vacutech systems operations and utilized said information as part of the noise model. The referenced data assumes the use of vacuums (claw tool and crevice tool), air nozzles to blow off the car, and typical patron usage at vacuum stalls.

Table 2: Reference Sound Level Measurements for SoundPLAN Model (dBA)

Source	Source Type	Reference Level (dBA)	Distance (ft)
120 HP IDC Predator Dryers	Point Source	87	5
Vacutech	Point Source	71	2
Vacuum Turbine (Inside Enclosure)	Point Source	43	3

All other noise-producing equipment (e.g., compressors, pumps) will be housed within mechanical equipment rooms. Vacuum turbines will be housed within CMU enclosures.

The following outlines the project design features:

1. The project shall incorporate a 120 HP International Dryer Company Predator system or equivalent to meet the acoustical benchmarks. Any modification of the dryer equipment would require a re-evaluation. The reference equipment sound level data is provided in Appendix C.

2. The project's exit will be 10'x10' or smaller.

3. The project will incorporate a 6' wall at the north property lines.

4. An acoustic liner (Acoustiblok perforated metal panels or equivalent) will line 16' of the south wall near the exit (see Appendix C).

Exhibit E

Measurement Locations

7.0 Existing Noise Environment

Three (3) 15-minute ambient noise measurements were conducted at or near the project site. Noise data indicates that traffic along Grand Avenue is the primary source of noise impacting the site and the surrounding area. The ambient data confirms that the existing noise levels exceed the presumed ambient noise levels as indicated in the City's noise ordinance. Therefore, this assessment will utilize the ambient noise data as a basis and compare levels to said data.

7.1 Long-Term Noise Measurements Results

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

Table 3: Short-Term Noise Data (dBA)

Location	Start Time	Stop Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)
NM1	9:22 AM	9:37 AM	59.5	69.1	52.8	65.4	62.4	60	58.3	55
NM2	9:38 AM	9:53 AM	69.6	84.4	52.7	76.2	73	70.3	67.6	58.2
NM3	9:57 AM	10:12 AM	63.2	78.5	55.3	70.3	68.9	61.2	60.4	59.6

Notes:
1. Short-term noise monitoring locations are illustrated in Exhibit E.

Noise data indicates the ambient noise level ranges between 60 dBA Leq to 70 dBA Leq. These values exceed the minimum presumed ambient level of 50 dBA Leq as given in Section 9.16.040 of the Arroyo Grande Municipal Code. In accordance with the City's municipal code, the measured ambient will be used as the exterior noise standard. Additional field notes and photographs are provided in Appendix A.

8.0 Future Noise Environment Impacts

This assessment analyzes future noise impacts as a result of the project. The analysis details the estimated exterior noise levels. Stationary noise impacts are analyzed from the on-site noise sources such as dryers/blowers and vacuums (associated with car wash equipment).

8.1 Future Exterior Noise

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

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

Sensitive receptors that may be affected by project operational noise include existing residences to the north, northwest, and west. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. Worst-case assumes the blowers are always operational when in reality the noise will be intermittent and cycle on/off depending on customer usage. Project operations are assumed to occur within daytime hours.

Three (3) receiver location was analyzed to evaluate the proposed project's operational impact. All receptors represent adjacent residential properties.

This study compares the Project's operational noise levels to two (2) different noise assessment scenarios: 1) Project only operational equivalent noise level projections Leq(h), 2) Project plus ambient CNEL noise level projections.

Project Only Equivalent Noise Levels Assessment
Exhibits F shows the "Project Only" equivalent noise levels and contours at the project site and nearest sensitive receptors for Leq(h). The project only noise levels range from 43 to 50 dBA at the various receptors.

The "project only" noise projections to the property lines are below the exterior limit of ambient Leq(h) for the receptors, and they are not increasing the ambient level.

Project Plus Ambient Noise Levels Assessment

Table 4 demonstrates the project plus the ambient noise levels. Project plus ambient noise level projections are not anticipated increase the existing ambient noise level at the adjacent residential uses.

Table 4: Worst Case Predicted Operational Leq Noise Levels (dBA)

Receptor[1]	Existing Ambient Noise Level (dBA, Leq)[2]	Project Noise Level (dBA, Leq)[4]	Total Combined Noise Level (dBA, Leq)	Maximum Acceptable[3]	Change in Noise Level as Result of Project
1	60	49	60	60	0
2	60	50	60	60	0
3	70	43	70	70	0

Notes:
1. Receptors 1-3 represent residential uses.
2. See Table 3 for the short-term noise measurement data.
3. Municipal Code Section 9.16.040.
4. See Exhibit F for the operational noise level projections at said receptors.

As shown in Table 4, the noise level is not anticipated to change due to the project. Since the project noise level is below the ambient noise level at all locations, the project adheres to Section 9.16 of the Municipal Code. The impact is considered to be less than significant since it is below the standard limit.

8.2 Airport Noise Impact

The project site is located over two miles from the nearest major airport. Therefore, the airport noise impact is not considered for the impact study.

8.3 Project Design Features

The following outlines the project design features:

1. The project shall incorporate a 120 HP International Dryer Company Predator system or equivalent to meet the acoustical benchmarks. Any modification of the dryer equipment would require a re-evaluation. The reference equipment sound level data is provided in Appendix C.

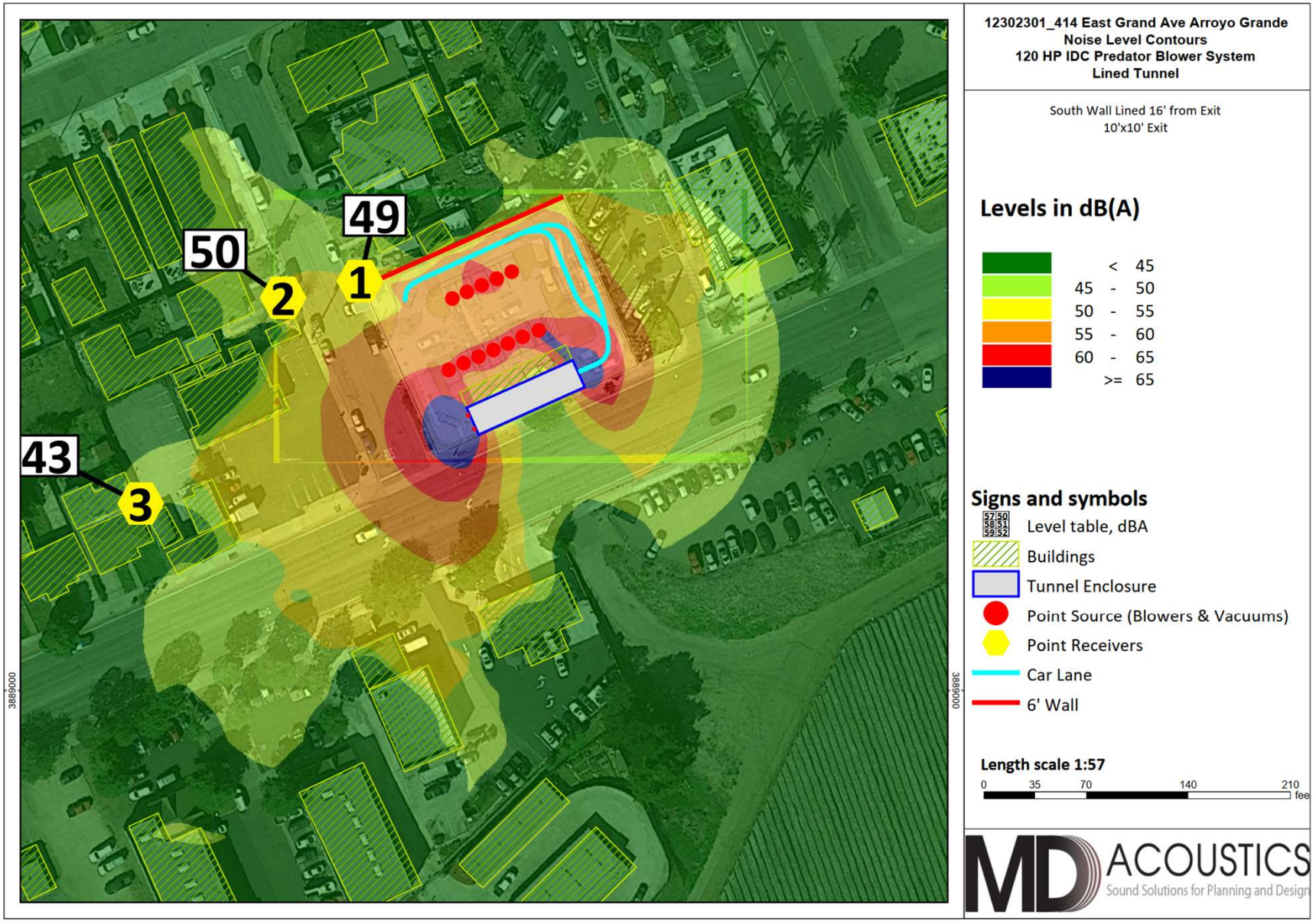
2. The project's exit will be 10'x10' or smaller.

3. The project will incorporate a 6' wall at the north property lines.

4. An acoustic liner (Acoustiblok perforated metal panels or equivalent) will line 16' of the south wall near the exit (see Appendix C).

Exhibit F

Operational Noise Level Contours



9.0 References

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

City of Arroyo Grande: General Plan Noise Element

City of Arroyo Grande: Municipal Code Chapter 9.16

Federal Highway Administration. Noise Barrier Design Handbook. June 2017.

Federal Transit Administration. Transit Noise and Vibration Impact Assessment Manual. September 2018.

Appendix A:

Photographs and Field Measurement Data

15-Minute Continuous Noise Measurement Datasheet

Project Name:	414 E Grand Ave Automatic Car Wash
Project: #/Name:	1230-2023-001
Site Address/Location:	414 East Grand Avenue
Date:	12/12/2023
Field Tech/Engineer:	Jason Schuyler / Naomi Jensen

Site Observations:

Clear sunny Skys, Winds 0-3MPH NM1 was placed on the P/L of the adjacent neighbor. NM1 recorded a loud deep sound wave from a container truck dropping its load on the asphalt. NM2 was placed 12' from the curb on Oak St. and 14' From the curb of E Grande Ave. NM3 had a refrigerated trailer pull into the parking lot in the first minute and then the truck pulled forward making little more than back ground noise.

Sound Meter:	XL2, NTI	**SN:**	A2A-08562-E0
Settings:	A-weighted, slow, 1-sec, 15-minute interval		
Site Id:	NM1, NM2, NM3		

MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: 414 E Grand Ave Automatic Car Wash

Site Address/Location: 414 East Grand Avenue

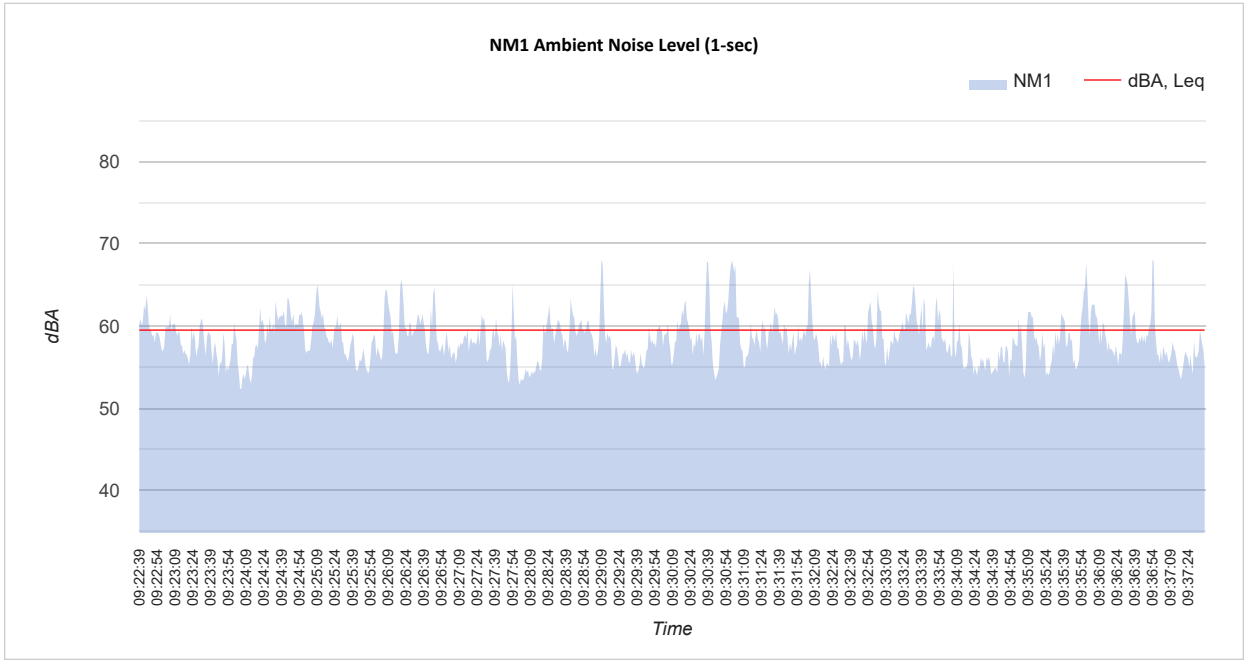
Site Id: NM1, NM2, NM3

Table 1: Baseline Noise Measurement Summary

Location	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
NM1	9:22 AM	9:37 AM	59.5	69.1	52.8	65.4	62.4	60	58.3	55
NM2	9:38 AM	9:53 AM	69.6	84.4	52.7	76.2	73	70.3	67.6	58.2
NM3	9:57 AM	10:12 AM	63.2	78.5	55.3	70.3	68.9	61.2	60.4	59.6

15-Minute Continuous Noise Measurement Datasheet - Cont.

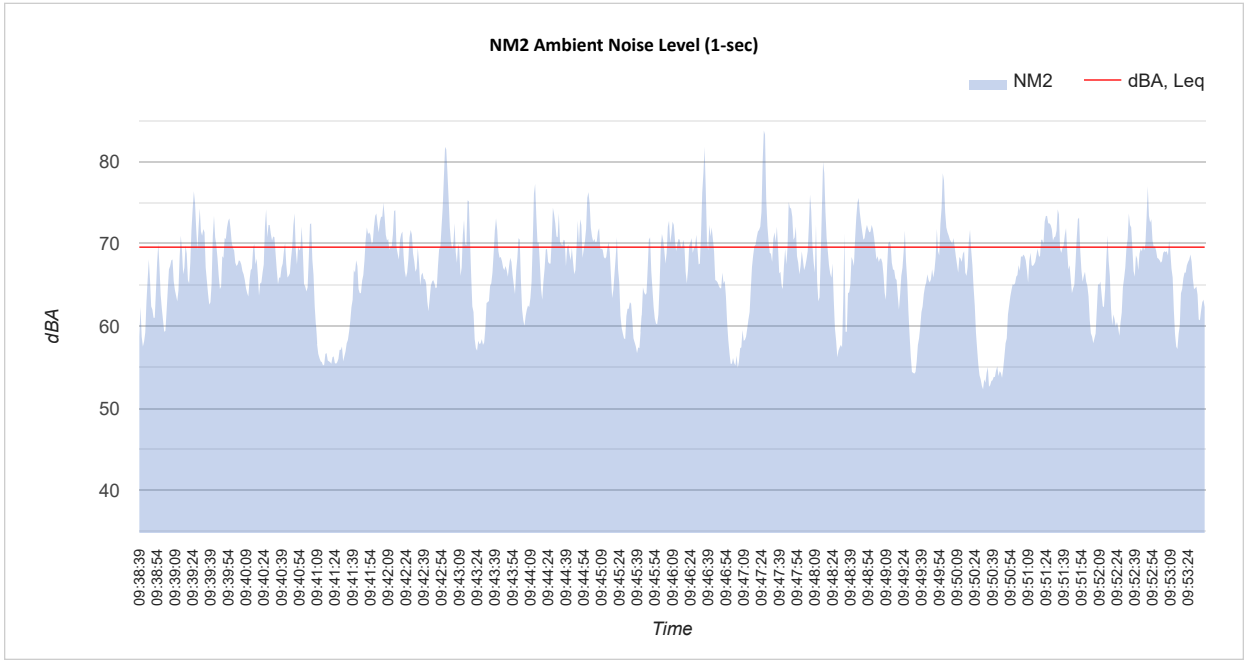
Project Name:	414 E Grand Ave Automatic Car Wash	**Site Topo:**	Buildings 1-2 stories tall	**Noise Source(s) w/ Distance:**
Site Address/Location:	414 East Grand Avenue	**Meteorological Cond.:**	55F Winds 1-3MPH	road noise and residential noise
Site Id:	NM1	**Ground Type:**	buildings and asphalt	



MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

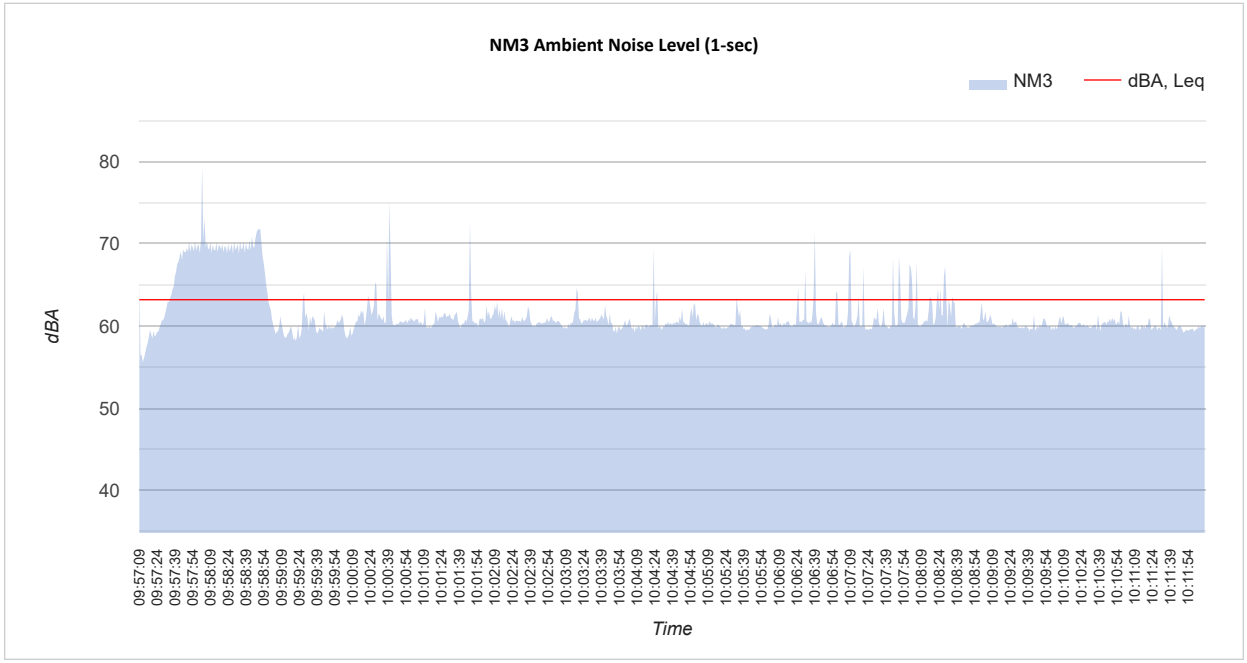
Project Name:	414 E Grand Ave Automatic Car Wash	**Site Topo:**	Buildings 1-2 stories tall	**Noise Source(s) w/ Distance:**
Site Address/Location:	414 East Grand Avenue	**Meteorological Cond.:**	55F Winds 1-3MPH	road noise and residential noise
Site Id:	NM2	**Ground Type:**	buildings and asphalt	



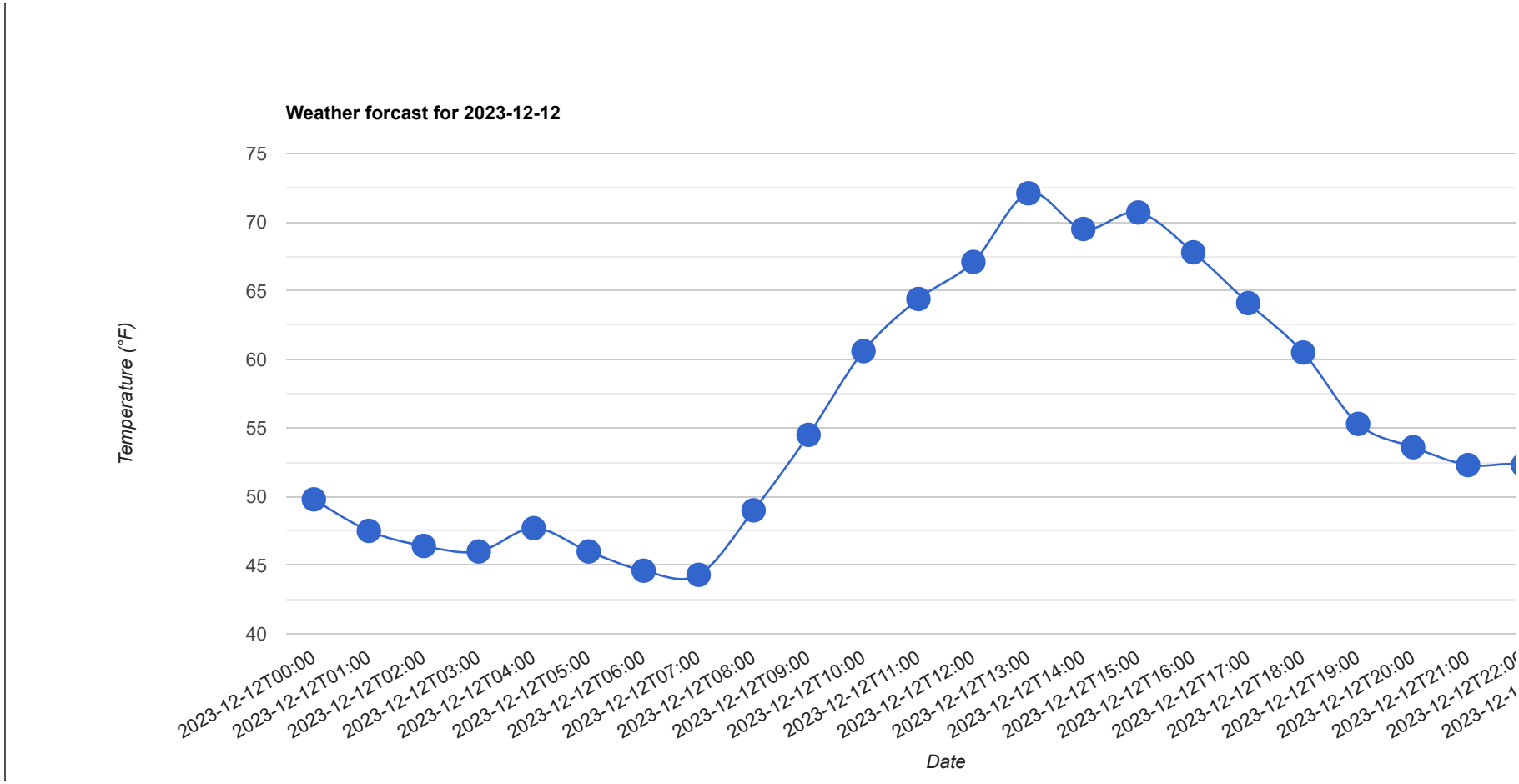
MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name:	414 E Grand Ave Automatic Car Wash	**Site Topo:**	Buildings 1-2 stories tall	**Noise Source(s) w/ Distance:**
Site Address/Location:	414 East Grand Avenue	**Meteorological Cond.:**	55F Winds 1-3MPH	road noise and residential noise
Site Id:	NM3	**Ground Type:**	buildings and asphalt	



MD ACOUSTICS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Temperature (°F)
75
70
65
60
55
50
45
40
2023-12-12T00:00
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2023-12-12T02:00
2023-12-12T03:00
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2023-12-12T16:00
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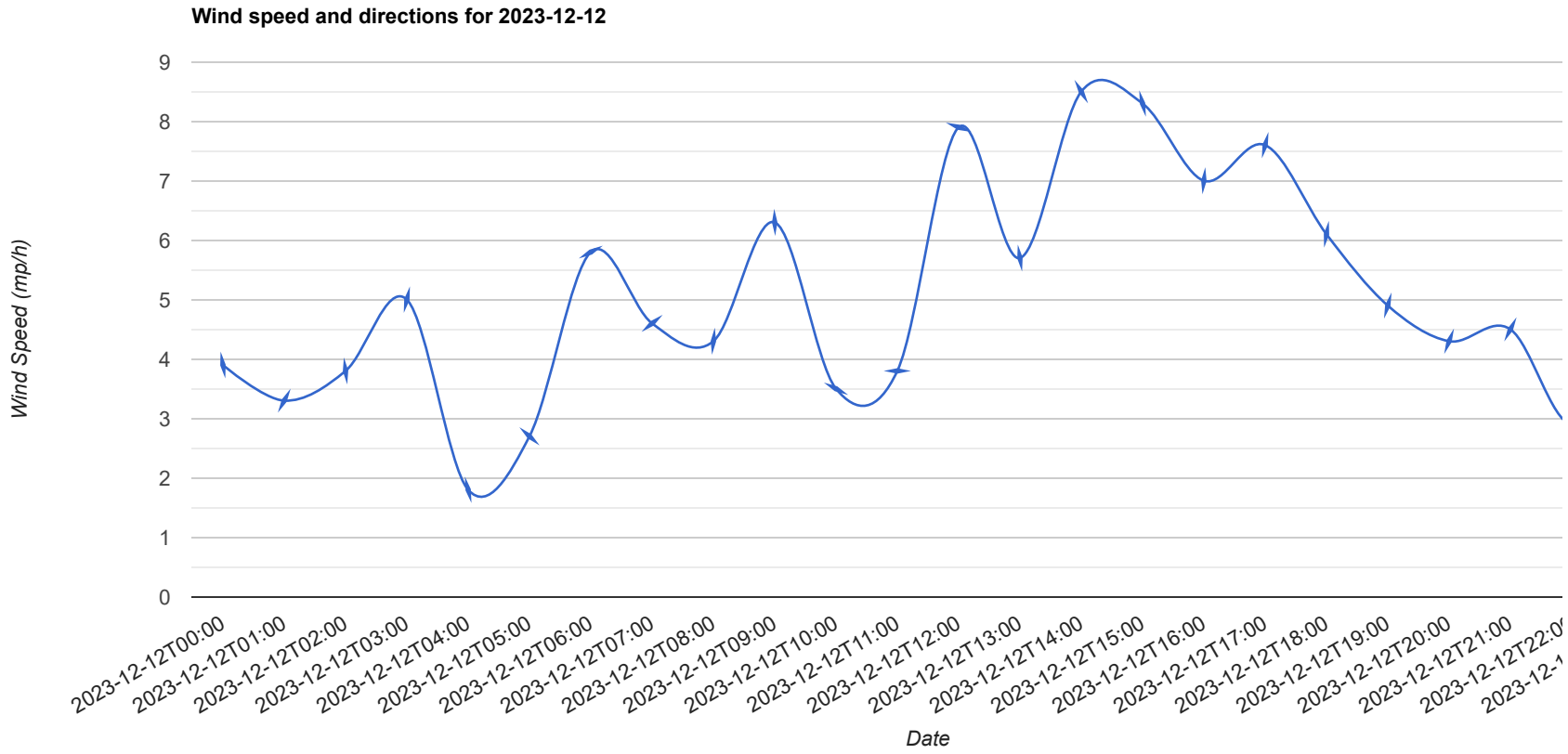
2023-12-12T20:00
2023-12-12T21:00
Date


Wind speed and directions for 2023-12-12
Wind Speed (mp/h)
9
8
7
6
5
4
3
2
1
0
2023-12-12T00:00
2023-12-12T01:00
2023-12-12T02:00
2023-12-12T03:00
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2023-12-12T19:00
2023-12-12T20:00
2023-12-12T21:00
Date

Appendix B:

SoundPLAN Input/Outputs

414 East Grand Ave Arroyo Grande
Contribution level - 003 - 120 HP IDC Predator - Lined: Outdoor

Source	Source ty	Leq,d dB(A)	
Receiver R1 Fl G Lr,lim dB(A) Leq,d 49.2 dB(A) Sigma(Leq,d) 0.0 dB(A)			
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 01	Area	47.9	
Car Lane	Line	37.4	
Vac	Point	32.6	
Vac	Point	31.7	
Vac	Point	31.1	
Vac	Point	31.0	
Vac	Point	30.9	
Vac	Point	30.9	
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 02	Area	30.9	
Vac	Point	30.3	
Vac	Point	29.7	
Vac	Point	29.4	
Car Lane	Line	28.9	
Vac	Point	28.8	
Vac	Point	28.3	
Vac	Point	27.8	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 04	Area	5.1	
001 - 120 HP IDC Predator- Lined Tunnel-Roof 01	Area	2.9	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 03	Area	-2.2	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 01	Area	-5.0	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 02	Area	-15.5	
Receiver R2 Fl G Lr,lim dB(A) Leq,d 50.4 dB(A) Sigma(Leq,d) 0.0 dB(A)			
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 01	Area	49.6	
Car Lane	Line	35.2	
Vac	Point	32.1	
Vac	Point	31.2	
Vac	Point	31.2	
Vac	Point	31.0	
Vac	Point	30.6	
Vac	Point	30.4	
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 02	Area	30.3	
Vac	Point	30.1	
Vac	Point	30.0	
Vac	Point	29.8	
Vac	Point	29.5	
Vac	Point	29.4	
Car Lane	Line	29.3	
Vac	Point	29.2	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 04	Area	2.7	
001 - 120 HP IDC Predator- Lined Tunnel-Roof 01	Area	2.5	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 03	Area	-1.2	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 01	Area	-4.3	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 02	Area	-15.8	

414 East Grand Ave Arroyo Grande
Contribution level - 003 - 120 HP IDC Predator - Lined: Outdoor

Source	Source ty	Leq,d dB(A)	
Receiver R3 Fl G Lr,lim dB(A) Leq,d 43.2 dB(A) Sigma(Leq,d) 0.0 dB(A)			
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 01	Area	42.5	
Vac	Point	26.3	
Car Lane	Line	25.9	
Vac	Point	25.6	
Vac	Point	25.2	
Car Lane	Line	23.5	
Vac	Point	23.3	
Vac	Point	23.0	
Vac	Point	22.8	
Vac	Point	22.6	
Vac	Point	22.5	
Vac	Point	22.3	
Vac	Point	20.4	
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 02	Area	20.3	
Vac	Point	20.3	
Vac	Point	20.0	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 04	Area	-3.7	
001 - 120 HP IDC Predator- Lined Tunnel-Roof 01	Area	-4.5	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 03	Area	-9.0	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 01	Area	-12.1	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 02	Area	-23.8	

414 East Grand Ave Arroyo Grande

Octave spectra of the sources in dB(A) - 003 - 120 HP IDC Predator - Lined: Outdoor SP

Name	Source type	I or A	Li	R'w	L'w	Lw	DO-Wall	Emission spectrum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
		m,m²	dB(A)	dB	dB(A)	dB(A)	dB		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
001 - 120 HP IDC Predator- Lined Tunnel-Facade 01	Area	145.28	80.7	57.0	31.3	52.9	3	399_Facade 01_		42.5	51.4	45.6	33.8	28.1	18.7
001 - 120 HP IDC Predator- Lined Tunnel-Facade 02	Area	18.55	76.8	57.0	29.1	41.8	3	400_Facade 02		28.0	40.9	33.2	15.5	0.1	
001 - 120 HP IDC Predator- Lined Tunnel-Facade 03	Area	145.28	79.7	57.0	30.5	52.1	3	402_Facade 03		42.2	50.6	44.4	32.6	26.9	17.4
001 - 120 HP IDC Predator- Lined Tunnel-Facade 04	Area	27.47	84.7	57.0	34.7	49.1	3	403_Facade 04		38.3	47.3	42.5	31.1	25.5	16.0
001 - 120 HP IDC Predator- Lined Tunnel-Roof 01	Area	148.40	81.6	57.0	32.2	53.9	0	392_Roof 01_		43.2	52.4	46.7	34.7	28.9	19.2
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 01	Area	9.30	85.6	0.0	85.6	95.2	3	404_Transmissive area 01		78.1	89.5	90.6	88.2	86.7	80.3
001 - 120 HP IDC Predator- Lined Tunnel-Transmissive area 02	Area	18.22	76.5	0.0	76.5	89.1	3	401_Transmissive area 02		71.4	86.6	84.8	76.1	65.3	49.6
Car Lane	Line	73.97			62.8	81.5	0	Drive-Thru - Idiling Car @ 6ft	65.5	67.0	70.5	74.2	75.1	76.3	72.7
Car Lane	Line	29.53			62.8	77.5	0	Drive-Thru - Idiling Car @ 6ft	61.5	63.0	66.5	70.2	71.1	72.3	68.7
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1
Vac	Point				74.9	74.9	0	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1

Appendix C:

Manufacturer's and Referenced Noise Data

Appendix I

Acoustiblok® quieting the world

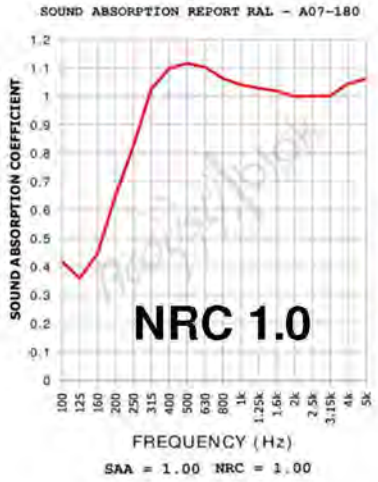
WORLDWIDE MADE IN USA

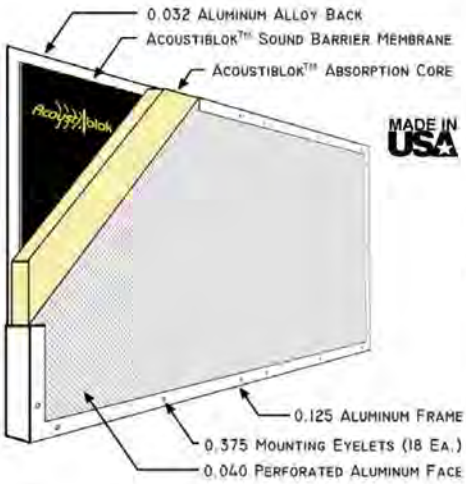
MOLD PROOF 100% CERTIFIED

100% Recyclable

North American Office
Acoustiblok, Inc.
6900 Interbay Boulevard
Tampa, FL 33616 USA
Phone: 813-980-1400
Fax: 813-549-2653
www.acoustiblok.com
sales@acoustiblok.com

Industrial Model All Weather Sound Panel™ (Pat. Pend)
Technical Data





Acoustiblok All Weather Sound Panels™ achieve high STC and NRC ratings. They have been specifically designed to withstand outdoor exposure in full sunlight, extreme weather conditions, and harsh industrial environments. (NRC of 1.0 is the highest sound absorption rating possible)

All Weather Sound Panels include an internal layer of U.L. classified Acoustiblok sound isolation material plus a specifically engineered 2" thick weather proof sound absorbing material.

Specifications:		
NRC (Noise Reduction Coefficient):	1.00 *	Gross dimensions: up to 48" x 120"x 2.423", ± 0.125" custom sizes available on special order.
STC (Sound Transmission Class):	29 *	Frame construction: 0.125" welded corrosion resistant 6063-T5 aluminum, mill finish, eyelets: 0.375" (18 ea.)
Weight: (8' panel)	104 lbs	Front face: 0.040 corrosion resistant 5052-H32 aluminum alloy, 3/32" round holes staggered on 5/32" centers.
UL Std 723 fire resistance: Flame spread 0, smoke developed 0.		Back face: 0.032 corrosion resistant 5052-H32 aluminum alloy, mill finish.
UV tolerant, animal resistant, washable, does not support mold growth.		

* Independent Testing by accredited NVLAP testing facility in compliance with ASTM E90, E 413, and other applicable industry standards.

Subject to change without notice, contact Acoustiblok for details.

Product Data Sheet

Product Name

QuietFiber® Hydrophobic Noise Absorption Material – QF2

For Manufacturer Info:

Contact:
Acoustiblok, Inc.
6900 Interbay Boulevard
Tampa, FL 33616
Call - (813) 980-1400
Fax - (813)849-6347
Email - sales@acoustiblok.com
www.acoustiblok.com

Product Description

Basic Use

QuietFiber hydrophobic noise absorption material is an easily installed solution to many noise problems. It is engineered specifically for maximum noise absorption and is used extensively for industrial and commercial applications and is now being successfully introduced into non-industrial environments where reverberant sound and echo is a problem.

QuietFiber® QF2

QuietFiber is rated at the highest noise reduction level – NRC 1.00. Areas of high noise levels including sound reverberation can be resolved easily and economically by introducing QuietFiber into as much of the area as possible. The amount of noise reduction in highly reflective rooms will be directly relative to how much of the QuietFiber material can be installed into the room.

Unlike other fibrous materials which do not have the same high NRC ratings, QuietFiber is hydrophobic, meaning it will not absorb nor combine with water. Marine noise reduction applications are endless.

QuietFiber® QF2

- Highest noise absorption rating of NRC 1.00
- Non Silica
- Virtually fireproof – Class A fire rating
  - 0 Smoke + 0 Flame Development
- Hydrophobic – will not combine with water
- Will not support mold or mildew growth
- Available in plain, black or white face
- Full outdoor weather and U.V. tolerant
- Significant sound benefit v. fiberglass
- Install on top of acoustical ceiling tiles
- High temperature capable
- Comprised of up to 90% recycled material
- 100% recyclable

Product Data Sheet

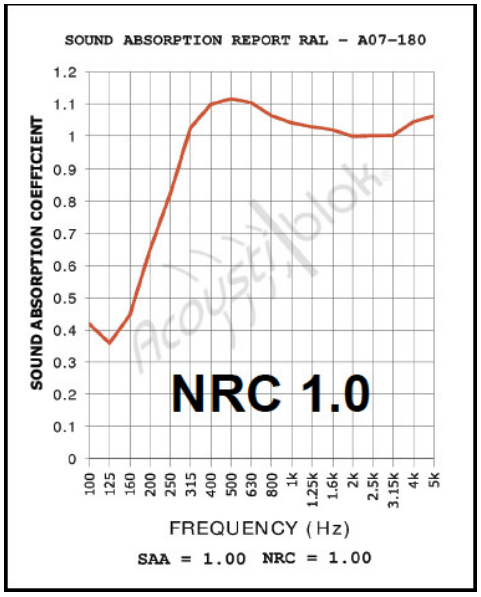
Product Name

QuietFiber® Hydrophobic Noise Absorption Material – QF2

NRC 1.0 Rated	125hz	250hz	500hz	1000hz	2000hz	4000hz
	0.36	0.79	1.15	1.04	1.01	1.04

Technical Data:

- ASTM C 423 – NRC 1.00
- ASTM E 84 – Class 1, 0 Flame 0 Smoke
- ASTM C 518 – R 4.2 per inch
- ASTM C 518 – 0.24 @ 75°F (24°C)



Standards Compliance:

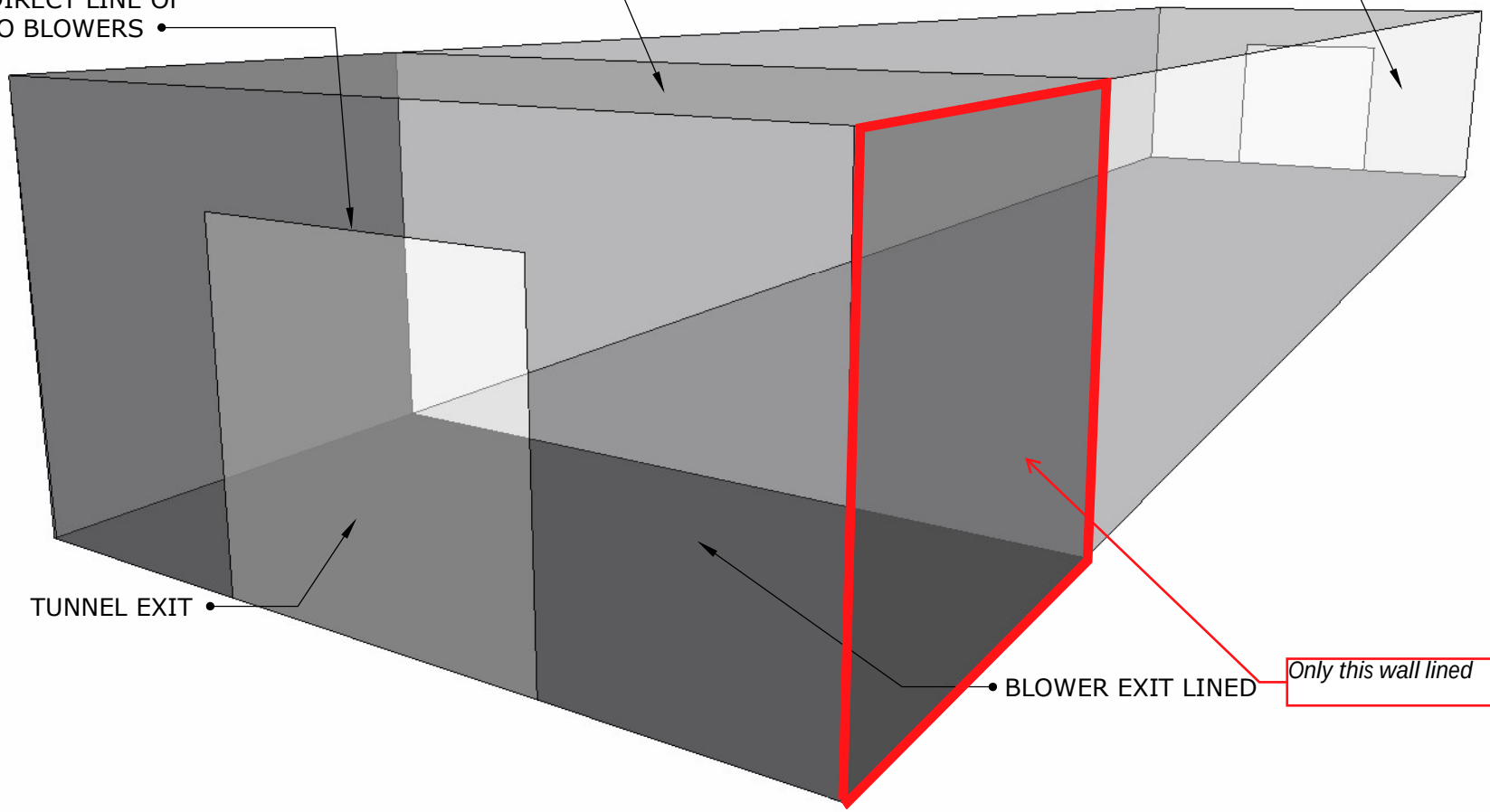
- ASTM C 665 Non-Corrosive Type I
- ASTM C 612 1A, 1B, II, III
- ASTM E 136 Rated Non-combustible per NFPA Standard 220
- ASTM C 1104 Absorption less than 1% by volume
- ASTM C 356 Linear shrinkage <2% @ 1200°F (650°C)

6900 Interbay Blvd
Tampa, Florida USA 33616
Telephone: (813)980-1440
www.Acoustiblok.com
sales@acoustiblok.com

LINE EXIT INTERIOR SECTION
OF BLOWER ROOM W/ 2" THICK ACOUSTIC
MATERIAL W/ NRC 1.0 OR EQUIVALENT.
LINER NEEDS TO BE ADDED
TO ALL SURFACES EXCEPT FLOOR

TUNNEL ENTRANCE

TUNNEL EXIT MUST
BLOCK DIRECT LINE OF
SIGHT TO BLOWERS



TUNNEL EXIT

BLOWER EXIT LINED

Only this wall lined

MD ACOUSTICS
Sound Solutions for Planning and Design

ACOUSTIC TREATMENTS TO TUNNEL INTERIOR

FOR ILLUSTRATIVE PURPOSES ONLY

MD ACOUSTICS
Sound Solutions for Planning and Design
www.mdacoustics.com

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4960 S. Gilbert Rd, Ste 1-461
Chandler, AZ 85249
p. (602) 774-1950

CA Office
1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065
p. (805) 426-4477

Project: SuperStar Car Wash Chula Vista
Site Location: 1555 W Warner Rd, Gilbert, AZ 85233
Date: 4/5/2018
Field Tech/Engineer: Robert Pearson
Source/System: Vacutec System

Location: Vac Bay 1
Sound Meter: NTi XL2 **SN:** A2A-05967-E0
Settings: A-weighted, slow, 1-sec, 10-sec duration
Meteorological Cond.: 80 degrees F, 2 mph wind

Site Observations:
Clear sky, measurements were performed within 1.5ft of source. Measurements were performed while the vacuum was positiioned at three (3) different positions. Holstered, unholstered and inside a car. This data is utilized for acoustic modeling purposes and represents an average sound level at a vacuum station.

Table 1: Summary Measurement Data

Source	System	Overall dB(A)	3rd Octave Band Data (dBA)																														
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K	12.5K	16K	20K
Vacutech (Holstered)	Vacuum	63.3	9	17	22	29	31	35	40	41	44	43	46	48	47	49	51	51	51	52	53	52	52	50	52	53	50	47	47	48	45	39	30
Vacutech (Unholstered)	Vacuum	80.7	6	19	22	28	34	37	40	43	47	46	48	48	48	49	54	55	58	58	62	65	68	70	74	75	73	69	67	65	63	60	55
Vacutech (Inside Car)	Vacuum	69.6	16	28	31	38	42	45	49	51	52	55	60	61	57	55	59	53	55	56	54	57	57	57	57	57	55	54	51	48	46	42	36
Average Level*	Vacuum	76.3	13	24	28	34	38	41	45	47	49	51	56	57	53	52	56	54	56	56	59	61	64	66	69	70	68	64	62	60	58	55	50

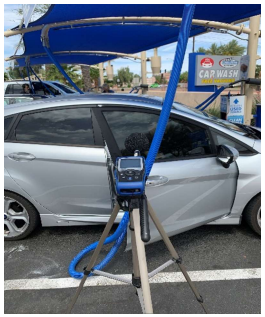
* Refers to the logarithmic average of all measurements. This measurement represents an average of the multiple vacuum positions.

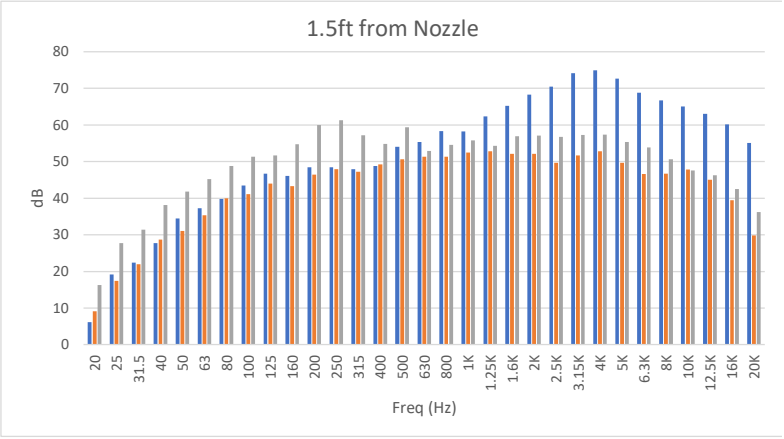
Figure 1: Example Measurement Position

Figure 1: Holstered

Figure 2: Unholstered

Figure 3: Inside Car





SOUND LEVEL METER READINGS

MODEL: FT-DD-T340HP4 (40hp VACSTAR TURBINE VACUUM PRODUCER)

READING ONE: 43 DB-A, 3 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING TWO: 36 DB-A, 10 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING THREE: 24 DB-A, 20 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING FOUR: 12 DB-A, 30 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

NOTE: THESE READINGS WERE TAKEN OUTSIDE OF 8'x10'x8' CINDER BLOCK ENCLOSURE WITH CONCRETE SLAB AND WOOD JOIST ROOF.

SOUND LEVEL METER USED:

SIMPSON MODEL #40003 – MSHA APPROVED.
MEETS OSHA & WALSH-HEALY REQUIREMENTS FOR NOISE CONTROL.
CONFORMS TO ANSI S1.4-1983, IEC 651 SPECS FOR METER TYPE.

Vacutech
1350 Hi-Tech Drive, Sheridan WY, 82801
PHONE: (800) 917-9444 FAX: (303) 675-1988
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WEB SITE: vacutechllc.com

INTERNATIONAL DRYING
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STEALTH PREDATOR DRYING SYSTEM

THE FIRST "ULTRA QUIET" DRYING SYSTEM

- ✔Patent pending Reverse flow technology
- ✔Producers construced from 304 surgical stainless steel
- ✔Over 11,000 cubic feet per minute (CFM) per 10HP motor
- ✔Meets or exceeds most U.S. and International sound regulations
- ✔Sound & Performance studies done in reverberant sound room ISO 3741:2010, 3747:2010

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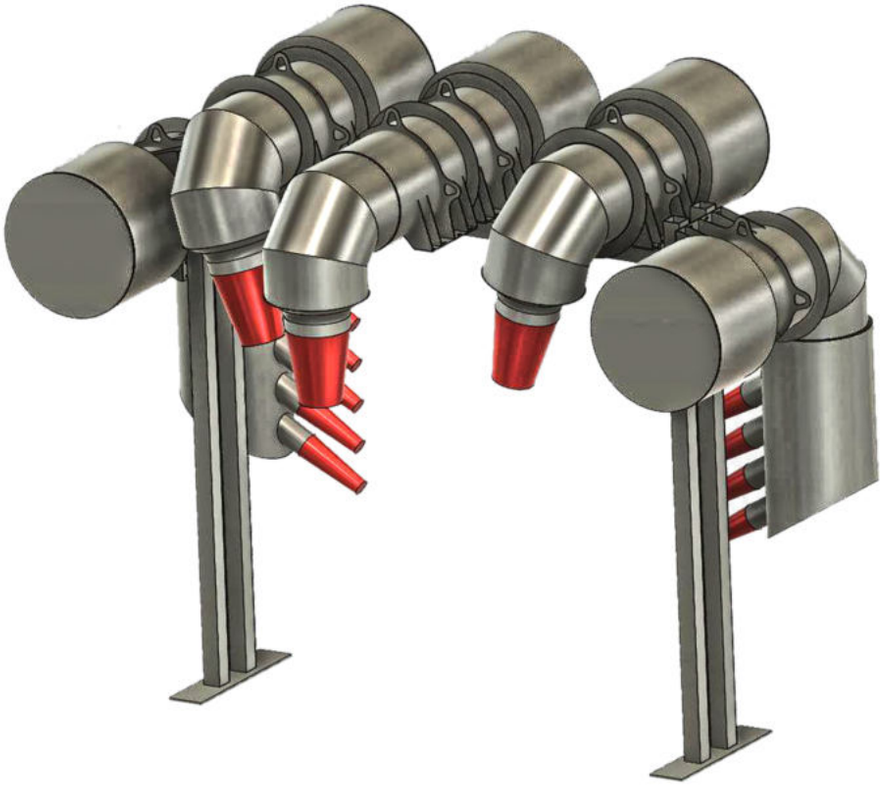
160 Chicago St
Cary, IL 60013

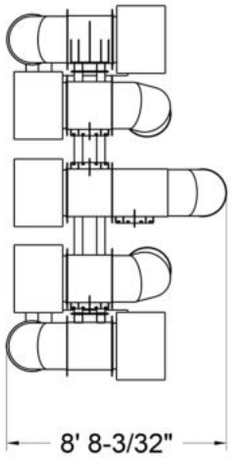
Stealth Predator Ultra-Quiet Drying System Specifications

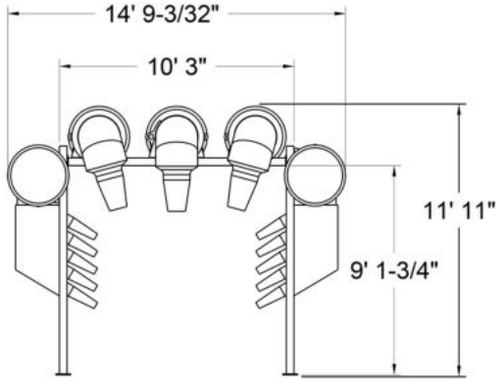
30HP System - Total Sound 60Hz		80HP System - Total Sound 60Hz	
Q = sound source			
65	dBA at Q=1, 30 feet	69.4	dBA at Q=1, 30 feet
61.8	dBA at Q=1, 45 feet	66.5	dBA at Q=1, 45 feet
60.2	dBA at Q=1, 55 feet	64.9	dBA at Q=1, 55 feet

Meets OSHA Sound Exposure Requirements

✓ **The Stealth Predator features patent pending "Reverse flow air technology" which creates the first "Ultra-Quiet Dryer" and is the most powerful Ultra Quiet Dryer ever designed.**







INTERNATIONAL DRYING CORPORATION

SPECIFICATIONS

15' 2" Bay Width
12' 0" Ceiling Height
96" Standard Clearance

Closed cell foam nozzles available in red, blue, black

Ducts-Stainless Steel
Molded Aluminum Impellors
Stainless Steel Motor Housings

Slotted flanges for adjustability of air outlet and air intake direction

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February 14, 2024

Mr. Ryan Talley

Subject: 414 East Grand Ave Car Wash – Noise Impact Study Response to Comments – Arroyo Grande, CA

Dear Mr. Talley:

MD Acoustics, LLC (MD) has received comments from the City of Arroyo Grande. MD has provided these responses to the comments as outlined below:

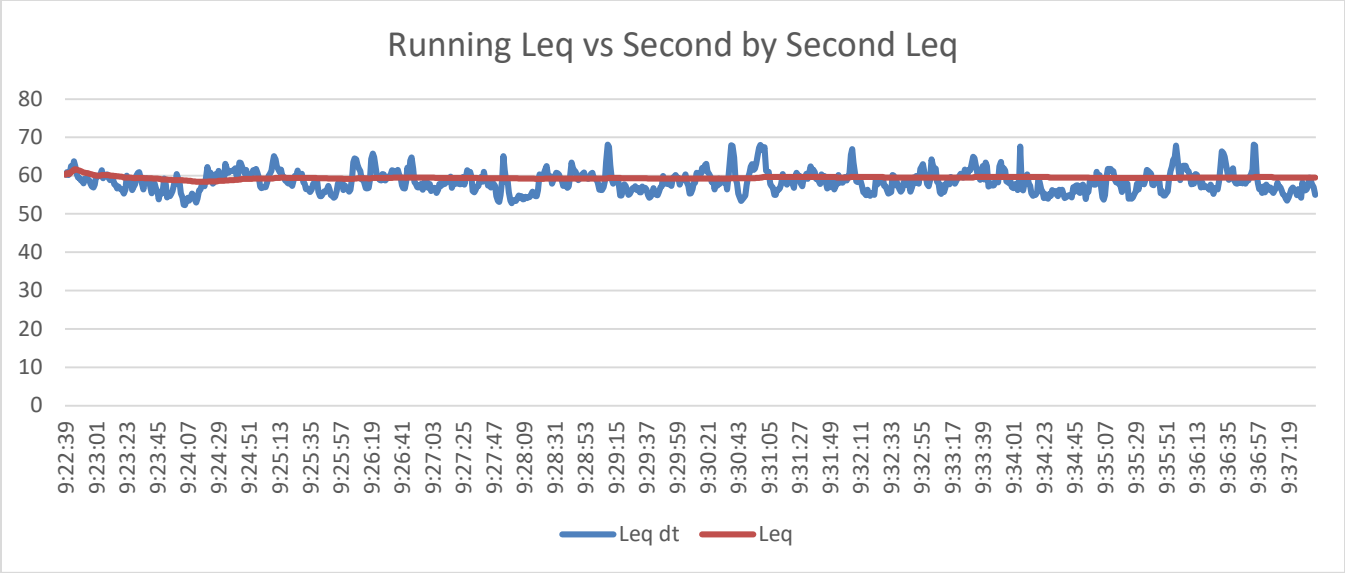
1. Why was the time period between 9:22 AM and 10:12 AM selected? Is there some narrative or justification indicating why this time period might be considered representative of noise conditions throughout the day?

MD Response: When choosing a time for measurement locations, we pick a time of day that represents a typical daytime condition. Between the hours of 9AM and 3PM, noise levels do not typically fluctuate by more than a decibel, making it a good period to take ambient noise levels. We are careful to avoid peak traffic hours so that we don't present an inflated ambient noise level to compare the operational levels to.

2. Similarly, can the consultant provide reasoning or justification as to how they determined that three consecutive 15 minute intervals would be sufficient in determining LEQ? The Arroyo Grande Municipal Code defines "Equivalent Sound Level (Leq)" as the following:
    a. "Equivalent Sound Level (Leq)" means the sound level containing the same total energy as a time varying signal over a given sample period. Leq is typically computed over one, eight and twenty-four (24) hour sample periods.

    Based on this, it seems that the sample period would have ideally been computed over a period of one, eight, or twenty-four (24) hours, rather than 45 minutes.

MD Response: This definition of Leq doesn't seem to be describing the City's preference in noise measurement duration but rather a definition of how Leq is often presented. 15-minutes is a very common Leq period which we base on FHWA methodology. When taking a noise level measurement, we want to capture the typical daytime level outside of peak hours. To ensure we have a good sample of a typical daytime level, we ensure that our Leq (the running average of the noise level during the sample) has leveled out. Here is an example of what I mean from NM1.



This chart shows the running Leq, the running average of the noise level in the sample, and the second-by-second Leq at NM1. Our goal is to ensure that the running Leq does not vary significantly for at least 5 minutes before the end of the measurement sample. This indicates that a larger sample would lead to a similar (and very likely nearly identical) noise level.

3. My recommendation would be for the Leq to be conducted based on the businesses intended hours of operation, in order to demonstrate compliance with the noise ordinance at the noisiest and quietest times throughout the day. If this is not the methodology that you as an applicant or your consultant on your behalf would like to utilize, it would be helpful for me to have an explanation as to why such information hasn't been provided or has been deemed unnecessary.

   The noise ordinance is most strict during the quieter hours of the day, like during 9AM to 3PM. The noise ordinance is based on the ambient noise level, and so if the noise level is louder, the ordinance is less strict. Since the car wash complies during the quietest part of the day, it will comply during the loudest part of the day. The car wash operations are at least 10 dB below the ambient noise level when compared to an off-peak daytime hours, and so the car wash will very easily comply with the noise ordinance at any time of day.

Please do not hesitate to call our office at 805-426-4477 with any questions or comments.

Sincerely,
MD Acoustics, LLC

Claire Pincock, INCE-USA
Consultant