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**ACOUSTICS**

# **ENVIRONMENTAL NOISE STUDY**

**3060 CARMEL VALLEY ROAD**

San Diego, CA

10.13.2023



# CONTENTS

<b>INTRODUCTION</b> .....	<b>3</b>
Project Description.....	3
Executive Summary.....	3
<b>APPLICABLE CODES</b> .....	<b>4</b>
Impact to Adjacent Properties.....	4
Exterior Noise Transmission.....	4
<b>Environmental Setting</b> .....	<b>6</b>
Sensitive Receptors.....	6
Measurements & Methodology.....	7
Existing Noise Conditions.....	7
<b>ANALYSIS</b> .....	<b>8</b>
Equipment Impact to Adjacent Properties.....	8
Interior Noise to Site.....	9
Traffic Analysis.....	10
Construction Noise.....	10
<b>APPENDIX</b> .....	<b>11</b>



# INTRODUCTION

This report contains design information on the environmental noise impact of the renovation of an existing gas station for KA Enterprises C-Store and Car Wash at 3060 Carmel Valley Road in San Diego, CA. This information is intended to assist KA Enterprises in meeting all noise level code requirements for the proposed construction set forth by the City of San Diego, including the City of San Diego Municipal Code, the Noise Element of the General Plan, the Noise Compatibility Guidelines (Table NE-3) in the Noise Element of the General Plan, the California Environmental Quality Act Significance Determination Thresholds (CEQA), and the San Diego International Airport Land Use Compatibility Plan.

The analysis provided is based on environmental noise measurements collected 09.27.2022 and Development Plans dated 03.04.2022.

## Project Description

The project site currently operates as a C-Store with fueling pumps. The scope of this project as it pertains to acoustics includes demolishing the current C-Store, constructing a new C-Store and car wash, and providing vacuum stations on the property. The existing fueling station will remain.

## Executive Summary

A 24-hour noise measurement was taken 09.27.2022 to capture the ambient noise of the project site. Using measured data from the site, the one hour average equivalent sound level ( $Leq_{1-hr}$ ) was calculated for 7am-7pm and 7pm-7am. The  $Leq_{1-hr}$  values were 72dBA and 69dBA respectively.

Using the measured data provided for the equipment (NCS Vacuums by VacuTech & MacNeil Tech 21 15 HP Dryers), relevant topographical data, and the captured ambient noise levels of the site, a SoundPLAN model was created. Assuming all vacuums and dryer units are operating at full capacity for 50 minutes of each hour from 7am-7pm and 50 minutes of 4 hours from 7pm-7am, the predicted noise levels at the property lines are anticipated to be within the required noise levels (65dBA 7am-7pm, and 60dBA 7pm-7am) outlined by the City of San Diego Municipal Code. Trip generation is anticipated to increase by 31% according to the Trip Generation analysis calculated using the City of San Diego Trip Generation Manual provided by LOS Engineering, Inc. The predicted noise levels due vehicle trip generation are predicted to be at least 3 decibels below the ambient noise levels present on site and therefore will not significantly increase the existing ambient noise levels (CEQA).

Assuming the worst-case scenario for exterior glazing, the interior noise level is within 50dBA as required by the Noise Compatibility Guidelines (Table NE-3). Providing this report satisfies the Noise Element of the General Plan. Note that the San Diego International Airport Land Use Compatibility Plan is not applicable to this site. CEQA and the San Diego Municipal Code require 75dBA  $Leq_{12-hr}$  for construction noise at residential property lines or sensitive receptors. Based on the predicted equipment and duration, the predicted noise levels at the nearest property line are 70dBA  $Leq_{12-hr}$ , which satisfies both CEQA and city construction noise code.

# APPLICABLE CODES

The applicable noise codes can be split into two categories: Noise impacts from the project site to adjacent properties and exterior noise transmission. The San Diego Municipal Code, the Noise Element of the General Plan Section NE-A.5, and CEQA Construction Noise apply to adjacent properties. The San Diego International Airport Land Use Compatibility Plan, the Noise Compatibility Guidelines (Table NE-3) in Noise Element of the General Plan, and CEQA Table K-2 apply to exterior noise transmission.

## Impact to Adjacent Properties

### City of San Diego Municipal Code – Section 59.5.0401. Sound Level Limits

- (a) *It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the table, at any location in the City of San Diego or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.*
- (b) *The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts.*

Per the Table of Applicable Limits under section (a), the maximum allowable noise level at the property line to Commercial Land Use is 65dBA Leq<sub>1-hr</sub> during the daytime hours of 7am-7pm and 65dBA Leq<sub>1-hr</sub> between 7pm-7am.

### City of San Diego Municipal Code – Section 59.5.0404. Construction Noise

- (a) *It shall be unlawful for any person, including The City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00a.m. to 7:00p.m.*

### Noise Element of the General Plan – Section NE-A.5

*Prepare noise studies to address existing and future noise levels from noise sources that are specific to a community when updating community plans.*

Completion of this report will satisfy the analysis required by the above code.

### CEQA Significance Thresholds – Temporary Construction Noise

*Temporary construction noise which exceeds 75 dB (A) Leq at a sensitive receptor would be considered significant. Construction noise levels measured at or beyond the property lines of any property zoned residential shall not exceed an average sound level greater than 75-decibels (dB) during the 12-hour period from 7:00 a.m. to 7:00 p.m.*

## Exterior Noise Transmission

### San Diego International Airport Land Use Compatibility Plan

*Areas within the Airport Influence Area (AIA) must follow regulations outlined in the Land Use Compatibility Plan based on the Review Areas (1 or 2) shown in Exhibit 1-1.*

This project is outside of the Airport Influence Area therefore this noise code does not apply.





**CEQA Significance Thresholds – Table K-2**

STRUCTURE THAT WOULD BE IMPACTED BY NOISE	EXTERIOR USABLE SPACE
Commercial, Retail, Industrial, Outdoor Spectator Sports	75dB

*If a project is currently at or exceeds the significance thresholds for traffic noise and noise levels would result in less than 3dB increase, then the impact is not considered significant.*

**Noise Element of the General Plan: Noise Compatibility Guidelines – Table NE-3**

Based on site measurements taken on 09.27.2022, the site is within the 70-75dBA CNEL Exterior Noise Exposure.

LAND USE CATEGORY	COMPATIBILITY FOR 70-75dBA CNEL EXPOSURE
Convenience Sales	Conditionally Compatible: Interior noise level must attenuate to 50dBA for occupied areas
Vehicle & Vehicular Services Use	Compatible



# ENVIRONMENTAL SETTING

## Sensitive Receptors

The City of San Diego General Plan Noise Element sets the standard designed to protect noise-sensitive land uses from high noise levels and to be used as guidelines for future land uses. Noise-sensitive land uses include and are not limited to residential, hospitals, libraries, places of worship, educational facilities, etc.

According to the City of San Diego Development Services Zoning Grid Map 35, the project site and all adjacent property lines are zoned for Commercial use. Across Carmel Valley Road from the project site, there is a large Agricultural Zone that is understood to be used by the city of San Diego for storage and use of large machinery and vehicles. The project site is located directly adjacent to Freeway I-5 and Highway 56. Based on the adjacent land zoning and current occupants, there are no noise sensitive receptors present within the area of acoustic impact of the site.

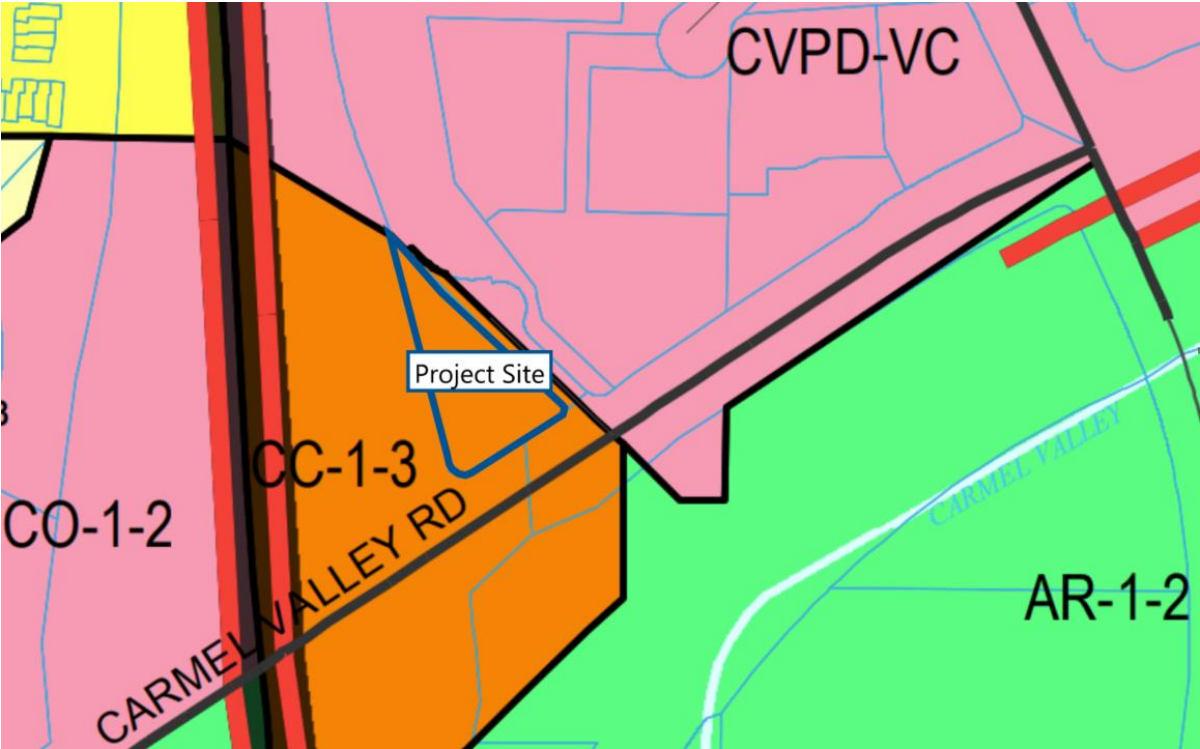


Figure 1: City of San Diego Development Services Zoning Grid Map

## Measurements & Methodology

On-site measurements were conducted for 24-hours beginning at 7am on 09.27.2022. Figure 2 below shows the location of noise measurements, the project site, and adjacent property lines.



Figure 2: Aerial Site Depiction Annotating Measurement Location / Project Site Details

## Existing Noise Conditions

The  $Leq_{1-hr}$  values were calculated from the data collected and are shown in the table below for each time period. Note that the existing ambient noise is louder than the thresholds outlined by the City of San Diego Municipal code.

METER	1-HR AVG SOUND LEVEL 7AM-7PM	1-HR AVG SOUND LEVEL 7PM-7AM
South Meter	72dBA	69dBA
North Meter	72dBA	68dBA

# ANALYSIS

## Equipment Impact to Adjacent Properties

The available noise data for the car wash equipment, provided in the Appendix, corresponds to nineteen (19) NCS vacuums operating simultaneously and eight (8) Tech 21 15HP dryers. The current design of this project utilizes fifteen (15) vacuums and five (5) dryers.

The provided data measured more equipment than utilized in this project. Using industry recognized software, the noise sources were scaled to match the number in the project. The sound pressure data was then modeled in SoundPLAN, a noise modelling program, to predict the noise created by the equipment.

Figure 3 shows the predicted hourly equivalent environmental noise level ( $Leq_{1-hr}$ ) if all equipment is operating for 50 minutes per hour between 7am-7pm (Fifteen (15) NCS Vacuums by VacuTech, five (5) MacNeil Tech 21 15 HP Dryers). Operation is likely to be intermittent during the day therefore this analysis considers the worst-case scenario.

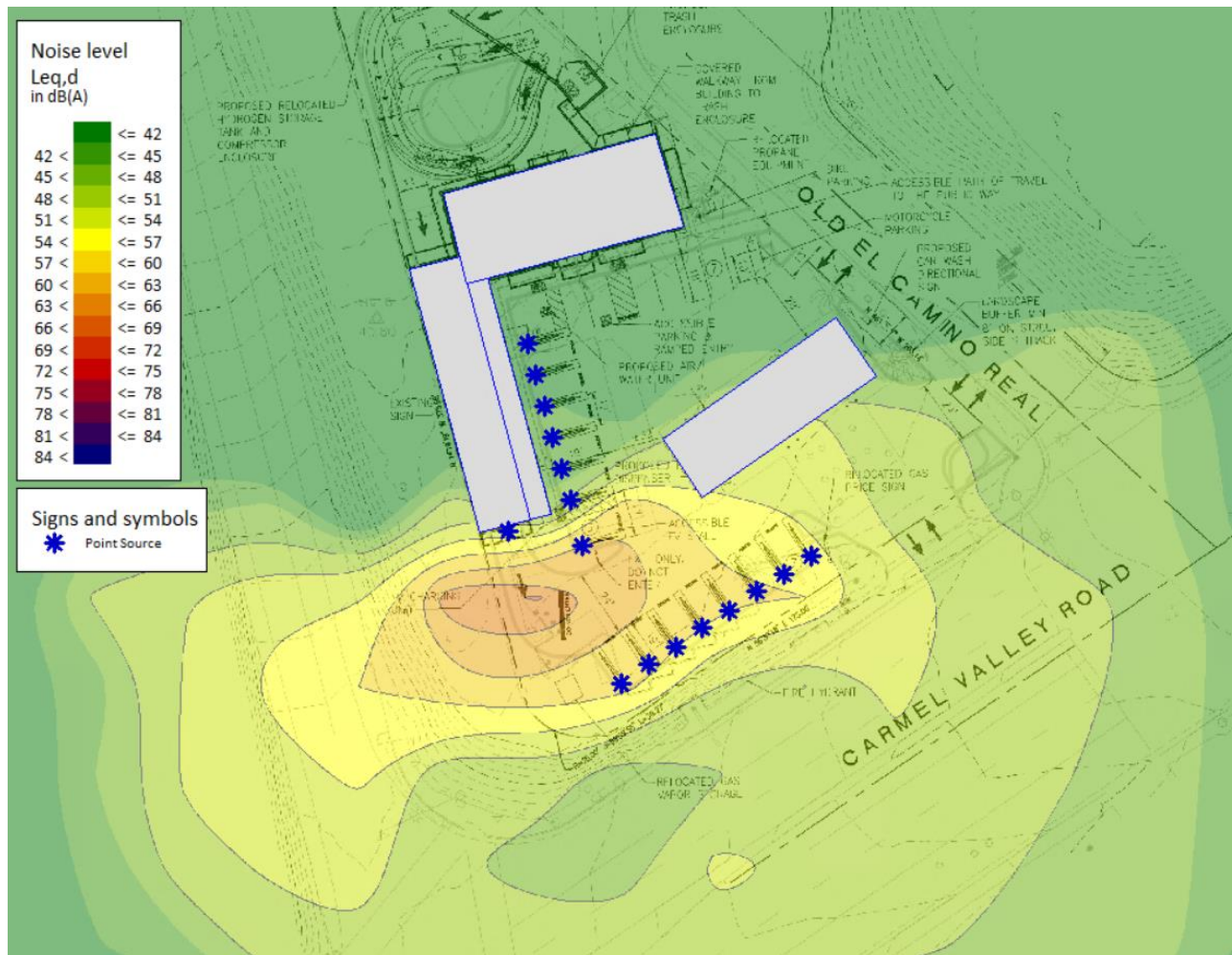


Figure 3: Hourly Equivalent Noise Levels 7am-7pm, 12-hr Full Operation



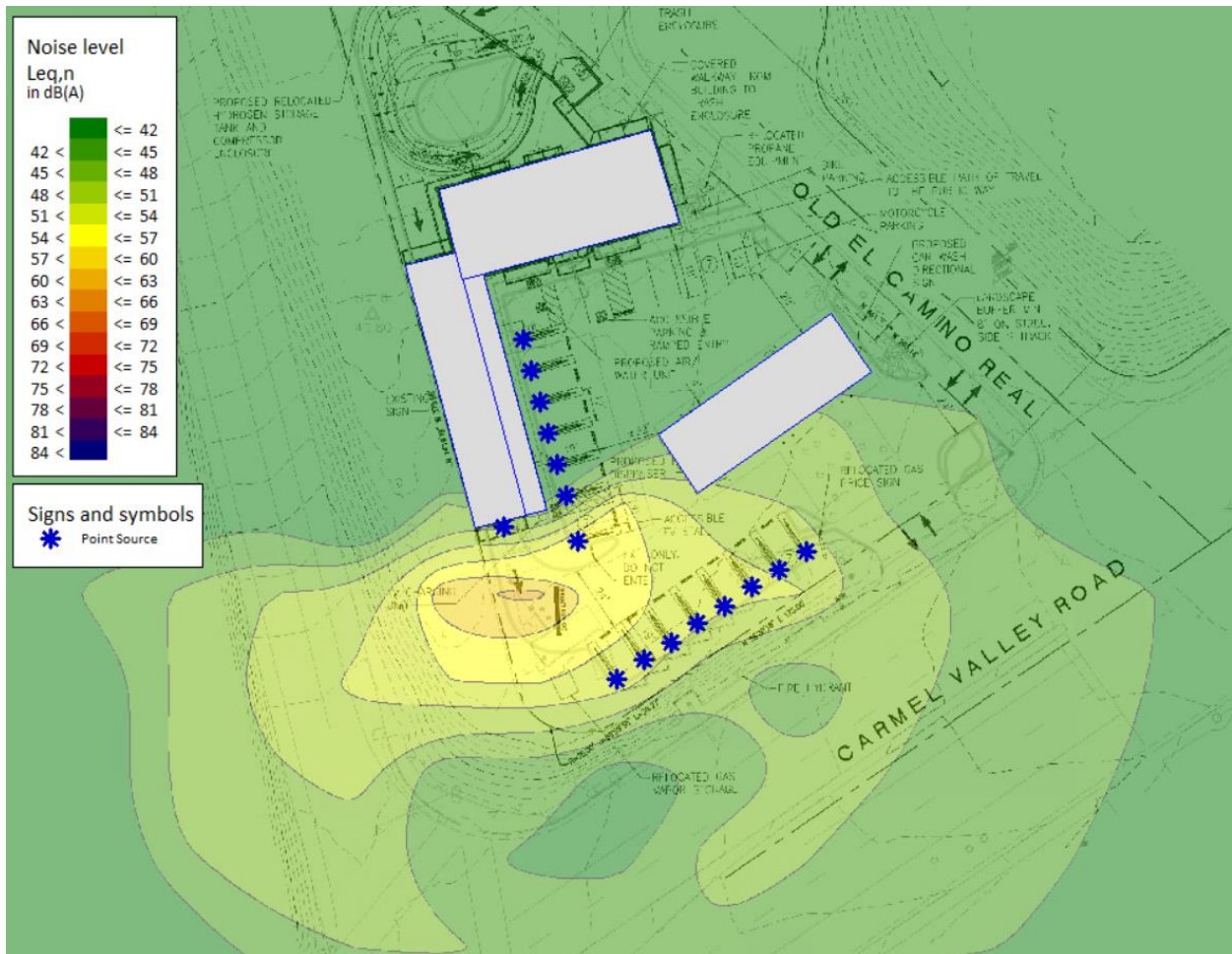


Figure 4: Hourly Equivalent Noise Levels from 7pm-7am, 4-hr Full Operation

To predict nighttime noise, the analysis considered all equipment running for a total of 50 minutes per hour for four hours in the 7pm-7am time window. It is likely the car wash will not be operational during these times, however it is included in the above analysis to provide the most conservative noise analysis. The 60dBA threshold is met along the property line with the assumption that the machinery will be operating no more than 200 total minutes in the nighttime hours. If the equipment will operate more the analyzed time throughout the night hours, noise mitigation strategies will be required to meet the noise thresholds.

According to City of San Diego Municipal Code, the hourly equivalent noise level produced by the project must be no greater than 65dBA between 7am-7pm and 60dBA between 7pm and 7am. As seen in Figure 3 and 4 above, the west property line is at 65dBA and 60dBA, which satisfies the City of San Diego Municipal code. Both daytime and nighttime predicted levels are significantly lower (4dB-15dB less) than the ambient noise levels currently on site. Therefore, CEQA thresholds will be met as the predicted noise levels will not significantly increase the existing ambient noise levels.

### Interior Noise to Site

To satisfy the Noise Element of the General Plan: Noise Compatibility Guidelines – Table NE-3, interior noise levels in the convenience store must be reduced to 50dBA in occupied areas.

As the glazing construction is not specified, an evaluation of two common constructions (1/4" and 1/2" monolithic glazing) with the lowest performing isolation performance were evaluated to assume the worst

case scenario. A composite construction, including exterior walls, windows, etc., would provide greater isolation resulting in lower interior noise levels than indicated in the table below.

1-HR AVG EXTERIOR NOISE LEVEL	CONSTRUCTION	CALCULATED INTERIOR NOISE LEVEL*
72dBA	1/4" Monolithic Glazing (STC-31/ OITC-29)	48-50dBA
	1/2" Monolithic Glazing (STC-36, OITC-33)	45-48dBA

\*Calculated interior noise levels are due to vehicular traffic noise. Calculations do not account for other interior noise sources such as HVAC, etc.

## Traffic Analysis

The existing trip count based on site data collected on 06.28.23 and 06.29.2023 was an average driveway trip of 1,421. Based on the trip generation analysis calculated using the City of San Diego Trip Generation Manual provided by LOS Engineering, Inc., the Adjusted Driveway Trips are predicted to be 439, which is a 31% increase. To increase the noise level due to traffic by 3dB, a 100% increase in traffic would be required. CEQA states that if the project is currently at or exceeds the significance thresholds and noise levels would result in a less than 3dB increase, the impact is not considered significant. In conclusion, based on the traffic generation report, the increase in traffic will not significantly impact the ambient noise of the site.

## Construction Noise

The allowable noise level is 75dBA Leq<sub>12-hr</sub> at an adjacent residential property line per City Noise Abatement and Control Ordinance Section 59.5.0404 and CEQA Significance Thresholds Section K.6 between the hours of 7am-7pm.

The site is an existing concrete site with fuel pumps to remain. The new construction will primarily be located along the west side of the site, which is approximately 100ft to the nearest adjacent property line (non-sensitive receptor). Based on the scope of the project, the primary construction equipment that will be utilized is an excavator with an air hammer attachment. According to Table C1 in the British Standard BS 5228-1:2009, the overall noise level for this equipment is 80dB at measured at 33ft. Using this data and assuming the equipment is operating for 8 hours of the workday, the predicted noise levels (instantaneous and 12 hour equivalent) are shown in the table below at the nearest property line.

LOCATION	DISTANCE	OVERALL INSTANT NOISE LEVEL*	12-HR EQUIVALENT NOISE LEVEL
Nearest Property Line	100ft	71dB	70dB

\*Predicted noise level is due to construction equipment only.

As shown in the table above, construction noise levels will be within the 75dBA Leq<sub>12-hr</sub> limit.

### Contributors:

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# APPENDIX

## Sound Data 4 Sons No. 509 Chevron Express Wash 1446 E. Chandler Blvd. Phoenix, AZ 85048

### DRYERS QTY-8 MACNEIL TECH 21 15HP DRYERS

Tunnel Exit

Ambient	64.5	0'
Dryers	94.2	

Ambient	59.2	10'
Dryers	90.5	

Ambient	58.1	20'
Dryers	88.1	

Ambient	55.5	30'
Dryers	86.4	

#### Notes:

All sound measurements below were taken with a VLIKE Model - VL6708 digital sound level meter. Settings were as follows: 40 ~ 90 dB range, "A" weighting mode, FAST (High Speed) mode



# APPENDIX



**February 10<sup>th</sup>, 2016**

**Re: Vacutech Sound Study Projections for Bella Terra Car Wash in Huntington Beach, CA**

**To: Chase Russell – Owner of Bella Terra Car Wash 16061 Beach Blvd. Huntington Beach, CA**

The chart below shows a cumulative average of that data taken from express car washes of this type and size. It is presented in an incremental form based on the worst case scenario of the vacuum hoses being off the hook, so to speak. Based on the collective average of the 45’ reading to the 85’ reading and is presented in the chart below:

<b>Vacutech Noise Study Projections</b>	
Average of all 19 hoses off and in use	
Average @ 45'	52.3 db
Average @ 55'	54.6 db
Average @ 65'	52.1 db
Average @ 75'	49.2 db
Average @ 85'	49.0 db

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

NOTE: Typical outside vacuum system with 1.5” x 15’ vacuum nozzles (4” wide by ¾” opening) in use with customer vacuuming.