

**7-ELEVEN STORE & CARWASH ADDITIONS
NOISE ASSESSMENT
PLEASANTON, CALIFORNIA**

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EXHIBIT C

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3192 Santa Rita Road

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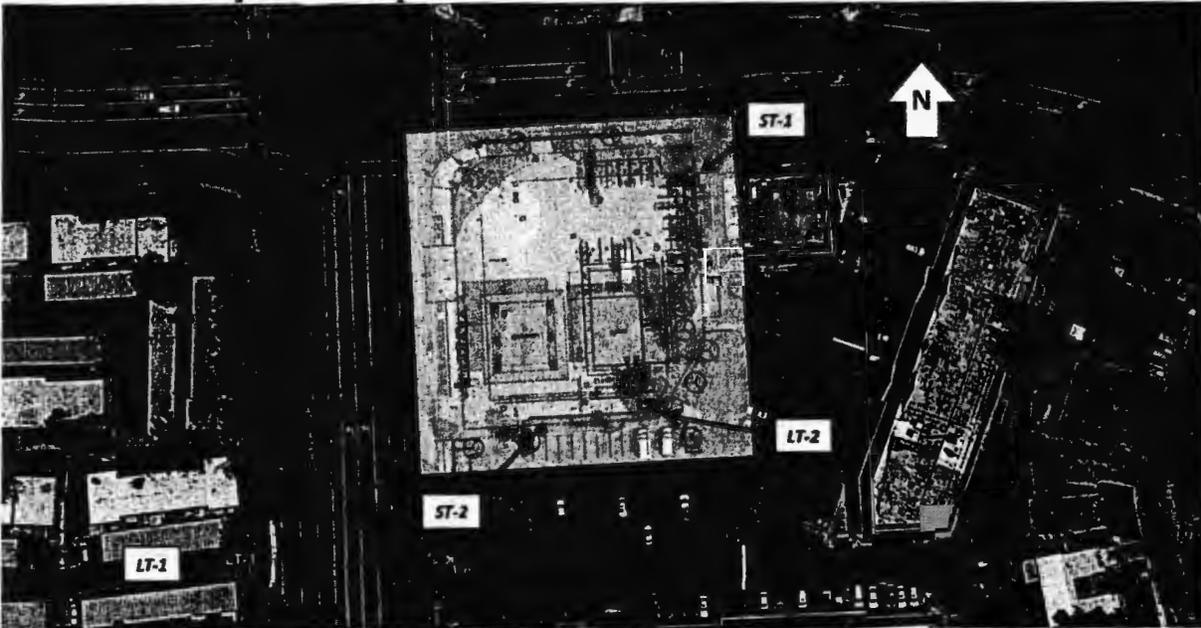
INTRODUCTION

This report presents the results of a noise assessment of the 7-Eleven Store and Carwash Additions project proposed at 3192 Santa Rita Road in Pleasanton, California. This report evaluates the project's potential to result in significant noise impacts with respect to applicable guidelines established by the City of Pleasanton's Noise Ordinance and General Plan Noise Element. The report provides a brief description of the fundamentals of environmental noise and vibration and summarizes applicable regulatory criteria. A recent ambient noise monitoring survey was conducted at the project site to document existing noise conditions, and the results of this survey are presented in this report. Additionally, based on provided project information, this assessment calculates and evaluates the future noise levels resulting from the proposed carwash operations. The impact to the noise environment at each of the surrounding land uses is discussed, and mitigation measures, where necessary, are recommended to achieve a compatible project in relation to adjacent noise sources and land uses.

PROJECT DESCRIPTION AND LOCATION

Currently, there is a Valero gas station, a small market, and an automotive service shop at this location. For the proposed project, the gas station canopy would remain, but the existing building containing the small market and automotive service shop would be demolished. In its place, a new 7-Eleven convenience store would be constructed with an attached carwash. The convenience store would be approximately 2,467 square feet. The total carwash area would be approximately 882 square feet. Additionally, a new parking area would provide approximately 17 parking spots. Figure 1 shows the project site, with the proposed project plans overlaid onto the existing geometry.

FIGURE 1 Project Site Map with Noise Measurement Locations



The project site is located in the southeast corner of the Santa Rita Road/West Las Positas Boulevard intersection. Santa Rita Road is a major six-lane roadway that runs north and south,

with a landscaped-median dividing the directions of travel. In the northbound direction, there are two left turn lanes and one right turn lane. West Las Positas Boulevard runs east and west with two through lanes in each direction separated by a concrete median. There are also two left turn lanes along West Las Positas Boulevard in the westbound direction.

The Las Positas Gardens Townhomes complex is located west of the project site opposite Santa Rita Road. This multi-family residential development has several two-story buildings with separate covered car ports. Though a six-foot fence shields the parking area from roadway traffic, the residential facades are unshielded, and fully exposed to roadway traffic and future project-generated noise. The nearest townhome structure is approximately 140 feet from the western property line of the project site and approximately 290 feet from the proposed carwash exit. A fire station is directly north, and another townhome complex is northeast of the project site opposite West Las Positas Blvd. The townhomes in this complex are also two-stories. The nearest townhome building is approximately 115 feet from the property line of the project site and approximately 220 feet from the entrance of the proposed carwash. The fire station is approximately 100 feet from the project site boundary, and due to the placements of the fire station and the proposed carwash buildings, it would be approximately 225 feet northwest from the entrance of the proposed carwash.

A restaurant and commercial/retail uses surrounded by public parking areas are adjacent to the project site to the east and south. The restaurant is approximately 50 feet from the proposed carwash entrance. The commercial retail has direct line-of-sight to the exit of the proposed carwash and is at distances of 160 to 185 feet from the exit. Single-family residences are located to the east of the commercial/retail uses. The commercial/retail uses are expected to provide noise shielding from the project-generated noise at these residences. However, some private-use areas in the backyards of the residences could have some exposure to the proposed carwash exit. These noise-sensitive areas would be approximately 350 feet from the exit.

Additionally, the Valley Care Medical Center is located to the northwest of the project site (approximately 600 feet from the project site) and the Fairlands Elementary School to the northeast (approximately 680 feet from the project site). Due to the distance from the project site, the proposed carwash would have minimal impact on these land uses.

FUNDAMENTALS OF ENVIRONMENTAL NOISE

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels

are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

TABLE 1 Definitions of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of 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. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting 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 frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

There are several methods of characterizing sound. The most common method in California is the *A-weighted sound level or dBA*. This scale gives greater weight to the frequencies of sound to

which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), Caltrans, November 2009.

Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq} . The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level, CNEL*, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level, L_{dn}*, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

REGULATORY CRITERIA

The proposed project would be subject to noise-related regulations, plans, and policies established within documents prepared by the City of Pleasanton. These documents are implemented during the environmental review process to limit noise exposure at existing and proposed noise-sensitive land uses. Applicable planning documents include: (1) the City of Pleasanton General Plan: Noise Element, and (2) the City of Pleasanton Noise Ordinance. Regulations, plans, and policies presented within these documents form the basis of the significance criteria used to assess project impacts.

City of Pleasanton General Plan Noise Element

The City of Pleasanton's General Plan Noise Element sets forth Noise and Land Use Compatibility standards for residential developments. Policies in this Element, which affect the residential land uses adjacent to the project site are:

- A 60 dBA L_{dn} goal is to be applied for single-family residences and a 65 dBA L_{dn} goal for multi-family residences where outdoor use is a major consideration (e.g., backyards in single-family housing developments and recreation areas in multi-family housing projects). For new residential developments, use the "normally acceptable" designation and text description contained in Table 11-5.
- People in front yards can generally tolerate up to 65 dBA L_{dn}; if the front yard noise level is greater than this, however, interior noise levels would become a concern.
- Indoor noise levels shall not exceed 45 dBA L_{dn} in multi-family dwellings or single-family residences.
- An exterior increase of more than 4 dBA is considered significant.

TABLE 11-5: NOISE AND LAND USE COMPATIBILITY GUIDELINES

Land Use Category	Exterior Noise Exposure (L _{dn})					
	55	60	65 ^b	70	75	80
Single-Family Residential *						
Multi-Family Residential, Hotels, and Motels *						
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds						
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches						
Office Buildings, Business, Commercial, and Professional						
Auditoriums, Concert Halls, Amphitheaters						

- a In noise environments resulting primarily from railroad trains, exterior noise levels up to 70 dBA Ldn are normally acceptable recognizing that day-night average noise levels are controlled by intermittent, loud events.
- b <65 dBA outdoors = < 45 dBA indoors



NORMALLY ACCEPTABLE
 Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements



CONDITIONALLY ACCEPTABLE
 Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.



UNACCEPTABLE
 New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Source: City of Pleasanton General Plan: Noise Element, 2005.

City of Pleasanton Noise Ordinance.

Sections of Title 9, Health and Safety, of the City of Pleasanton’s Municipal Code which are relevant to this noise assessment are as follows:

9.04.035 Noise Limits – Commercial or Industrial Use Adjacent to Residential Zone: Any business establishment which is located within 300 feet from any residential zone and which remains open for business at any time between the hours of 10:00 p.m. and 6:00 a.m. shall adhere to the following standards of performance:

- The noise level produced on the business premises between the hours of 10:00 p.m. and 6:00 a.m. shall not exceed the residential noise standard at the property plane between the residential zoning district and the commercial zoning district.
- No trash shall be dumped outside of the enclosed building area between the hours of 10:00 p.m. and 6:00 a.m. In the alternative, a business which finds it necessary or convenient to dump trash between 10:00 p.m. and 6:00 a.m. may demonstrate pursuant to section 9.04.110 of this chapter that sound levels from dumping trash are insignificant or have been adequately mitigated. This subsection does not prohibit regularly scheduled pick up of trash by commercial garbage companies.

9.04.040 Noise Limits – Commercial Property: No person shall produce or allow to be produced by any machine, animal, device, or any combination of the same, on commercial property, a noise level in excess of 70 dBA at any point outside of the property plane, unless otherwise provided in this chapter.

9.04.070 Daytime Exceptions: Any noise which does not produce a noise level exceeding seventy (70) dBA at a distance of twenty five feet (25') under its most noisy condition of use shall be exempt from the provisions of sections 9.04.030, 9.04.040, and subsection 9.04.060A of this chapter between the hours of eight o'clock (8:00) A.M. and eight o'clock (8:00) P.M. daily, except Sundays and holidays, when the exemption herein shall apply between ten o'clock (10:00) A.M. and six o'clock (6:00) P.M.

EXISTING NOISE ENVIRONMENT

The project site is located in the southeast corner of the intersection at Santa Rita Road and West Las Positas Boulevard. A field investigation was conducted to identify land uses that could be significantly impacted by project-generated noise, which includes carwash operations. Multi-family residences are located west (across Santa Rita Road) and northeast (across West Las Positas Boulevard) of the project site. There are single-family residences to the east of the project site, but these noise-sensitive residences would receive shielding from existing commercial/retail land uses and a restaurant adjacent to the project site. The commercial/retail land uses surround the project site to the south and southeast. To the north and across West Las Positas Boulevard is a fire station. Figure 1 shows the project site with the surrounding land uses.

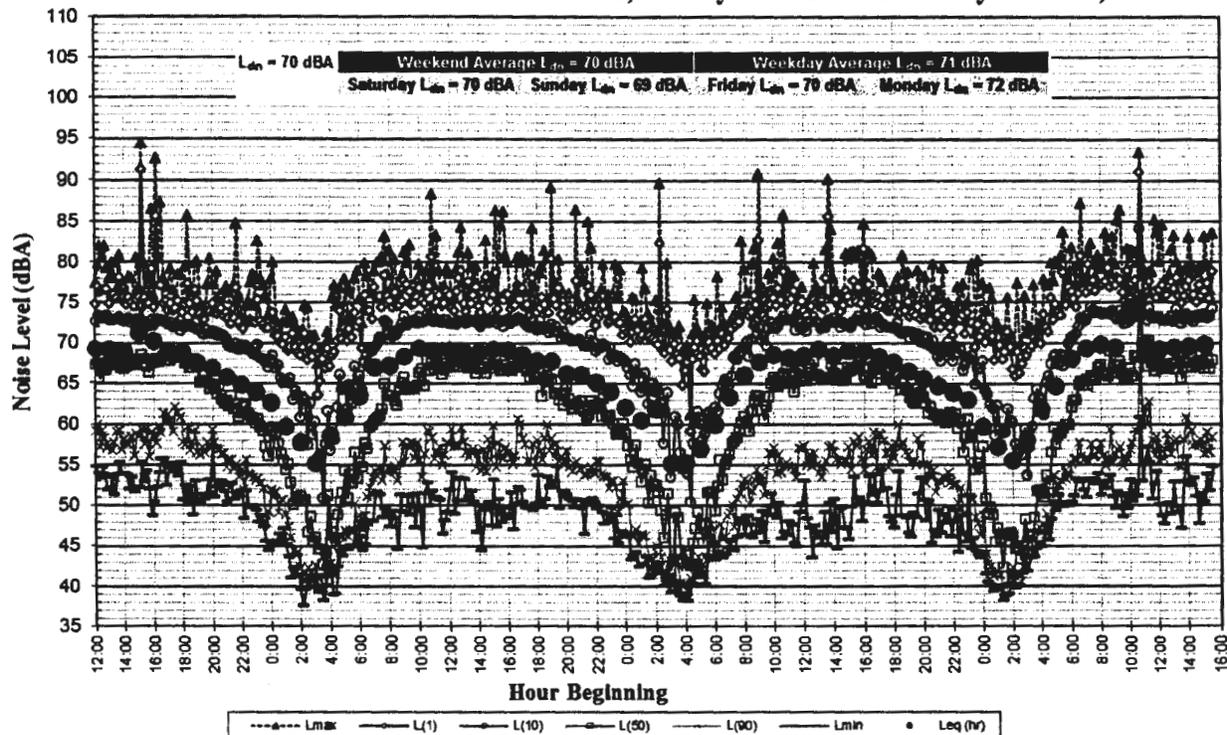
The main source of noise in the area is currently traffic from Santa Rita Road and West Las Positas Boulevard. Parking lot traffic from the gas station, automotive service shop, and retail plaza also affect the noise environment at noise-sensitive receptors surrounding the project site on a short, intermittent basis. For this noise assessment, measurements were conducted with Larson Davis Laboratories (LDL) Type I Model 820 Sound Level Meters equipped with ½-inch pre-polarized condenser microphones and windscreens. The meters were calibrated with a Larson Davis Model CA250 precision acoustic calibrator prior to and following the measurement survey.

Two long-term noise measurements and two short-term noise measurements were made between Friday, November 22, 2013 to Monday, November 25, 2013 to quantify the existing noise environment on the project site and the surrounding area. The noise measurement locations were selected to represent the noise exposure of the nearest multi-family residences and the adjacent commercial land uses. These locations are also shown in Figure 1.

Long-term noise measurement LT-1 was made, on the eastern property line of the Las Positas Gardens Townhomes, which was approximately 325 feet from the exit of the proposed carwash and approximately 30 feet from the centerline of the farthest right lane along Santa Rita Road southbound. The daily trend in noise levels at this long-term noise measurement site is summarized in Figure 2. The weekday hourly average noise levels for LT-1 typically ranged from 66 to 74 dBA L_{eq} during the day and from 56 to 68 dBA L_{eq} at night, with a weekday day-night average noise level of 71 dBA L_{dn} . On the weekend, the hourly average noise levels typically ranged from 63 to 69 dBA L_{eq} during the day and from 55 to 65 dBA L_{eq} at night, with

a weekend day-night average of 70 dBA L_{dn} . The weekday and weekend averages for each measurement for LT-1 are shown in Table 2.

FIGURE 2 Noise Levels Measured at LT-1, Friday Nov. 22 to Monday Nov. 25, 2013



Long-term noise measurement LT-2 was made at the southeastern corner of the project site, approximately 35 feet from the exit of the proposed carwash. The measurement was located to the east of existing convenience store parking spaces, to the west of the existing dumpster, and north and west of existing parking spaces for the retail plaza. The daily trend in noise levels at LT-2 is summarized in Figure 3. Hourly average noise levels for this long-term measurement site during the weekday typically ranged from 57 to 67 dBA L_{eq} during daytime hours and from 48 to 61 dBA L_{eq} during nighttime hours. The day-night average noise level at LT-2 during the weekday was 63 dBA L_{dn} . On the weekend, the hourly average noise levels ranged from 54 to 64 dBA L_{eq} during the daytime and from 47 to 57 dBA L_{eq} during the nighttime. The weekend day-night average level was 61 dBA L_{dn} . Table 2 also summarizes the LT-2 averages.

FIGURE 3 Noise Levels Measured at LT-2, Friday Nov. 22 to Monday Nov. 25, 2013

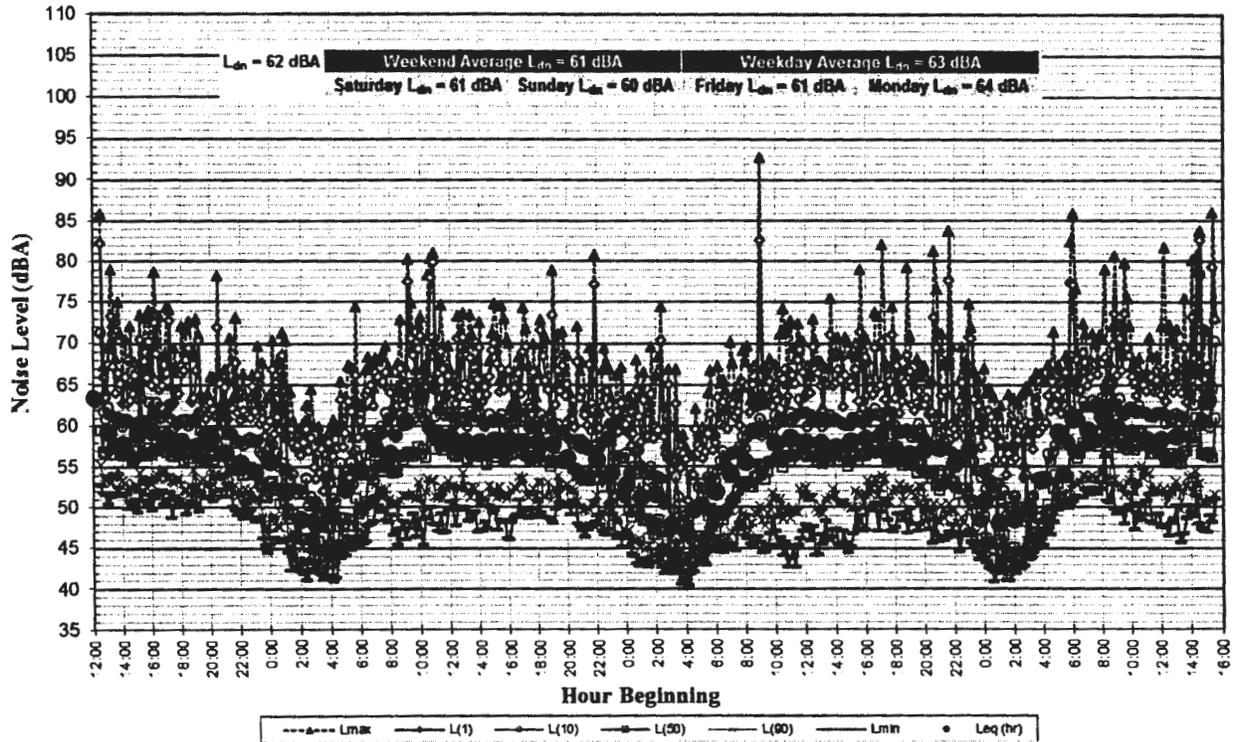


TABLE 2 Summary of Long-Term Noise Measurements

Noise Measurement Location	Weekday/Weekend	Long-Term Noise Measurements, dBA								
		Day	70	82	53	78	73	67	59	71
LT-1: Eastern property line of Las Positas Gardens Townhomes, ~325 feet from the exit of the proposed carwash	Weekday	Day	70	82	53	78	73	67	59	
		Night	63	78	48	73	67	58	51	
	Weekend	Day	68	80	50	76	72	65	56	70
		Night	61	76	45	72	65	56	49	
LT-2: Southeastern corner of the project site, ~35 feet from the exit of the proposed carwash	Weekday	Day	60	74	51	70	64	57	53	63
		Night	56	72	48	66	58	53	49	
	Weekend	Day	59	74	48	68	61	56	51	61
		Night	53	66	45	62	56	51	47	

The two short-term, ten-minute, noise measurements were made on Monday, November 25, 2013. Measurement site for ST-1 was in the northeast corner of the project site on the eastern property line, approximately 85 feet from the entrance of the proposed carwash and approximately 53 feet from the centerline of eastbound West Las Positas Boulevard. ST-2 was located on the southern property line of the project site, approximately 100 feet southwest of the exit to the proposed carwash and approximately 95 feet east of the centerline of the nearest through lane of Santa Rita Road northbound. Table 3 summarizes the results of both short-term measurements.

TABLE 3 Summary of Short-Term Noise Measurements

Noise Measurement Location	Short-Term Noise Measurements, dBA							
	L _{eq}	L _{max}	L _{min}	L ₀₁	L ₁₀	L ₅₀	L ₉₀	L ₉₅
ST-1: Northeastern corner of the project site, ~85 feet from the entrance of the proposed carwash (11/25/2013, 2:50-3:00 p.m.)	61	72	47	70	64	58	52	59
ST-2: Southwestern corner of the project site, ~100 feet from the exit of the proposed carwash (11/25/2013, 3:10-3:20 p.m.)	61	71	49	68	64	59	54	58

FUTURE PREDICTED NOISE ENVIRONMENT

For the proposed project, the existing convenience store and attached automotive service shop would be demolished. The proposed 7-Eleven store will be constructed in its place. Along with the store, a proposed carwash would be constructed adjacent to the store on the east side. Based on the orientation of the proposed carwash, vehicles would enter from the northern side of the property, adjacent to West Las Positas Boulevard. Noise-sensitive receptors to the north and northeast of the project site would be exposed to noise propagating from the carwash entrance. However, there is a proposed addition to the store, located on the north side of the building that would acoustically shield noise-sensitive receptors located to the northwest and west of the property site from noise emanating from the carwash entrance. The proposed carwash would be approximately 40 feet in length, and the vehicles would exit on the southeastern corner of the property. No doors are included in the building plans for the carwash, and no shielding from the noise at the exit is included in the plans. Figure 1 shows the proposed project superimposed onto the existing project site.

A speaker box located at the entrance of the carwash would create minimal noise, which would be directed towards the driver’s window of the car to be washed. The proposed carwash design does not include a conveyor belt. So, the main source of operational noise would come from water pump and spray noise during the wash cycle inside the carwash building and the blowers and vacuum used during the drying process after the washing cycle is complete. The blowers and vacuums would be located at the exit of the carwash. Since the pumps are located in the building interior and the water spray noise would occur in the wash tunnel and be largely shielded from any noise-sensitive receptors in the vicinity, the noise that could have the greatest impact on noise-sensitive receptors in the area would be the blower and vacuum systems. An AeroDry Systems, LLC, dryer system is proposed for use at the carwash. This system consists of two blowers with single motors and a third blower with two motors. A summary of the blower sound level measurements conducted by D.L. Adams Associates in 2002 was provided for this analysis. Results of that study showed overall A-weighted levels to be approximately 82.5 dBA at 5 feet and 79.4 dBA at 20 feet from the exit end of the tunnel. Based on previous car wash studies, levels at various distances can be extrapolated from this information; Table 4 presents the approximate noise levels for the AeroDry System at various distances from the blower. To reduce noise levels, AeroDry has also suggested their quiet dryer systems, which includes four 60-horsepower towers of the dryer installed inside the bay. Installing variable frequency drives (VFDs) would allow for decreased fan rotation, which would reduce noise levels by

approximately 5 dBA. To compensate for the lower air flow, the timing for a car to be dried would increase from 60 seconds to 90 seconds. Table 4 also reflects the calculated noise levels for the quiet dryers at various distances.

The chosen vacuum system for the 7-Eleven Car Wash Project was the IVS Power Vacuums, which is manufactured by Industrial Vacuum Systems, Inc. Measured noise level data were provided by the manufacturer at various distances and are also shown in Table 4. For the noise data of the vacuum system, ambient noise levels from street traffic, etc., were approximately 65 dBA with the vacuum unit not running. In addition to the blower and vacuum noise data provided us by the manufacturers, Table 4 shows the combined noise levels at various distances. Using the data from Table 4 and carwash blower directivity information supplied by other manufacturers, maximum (L_{max}) levels for the AeroDry Systems blowers and the IVS Power Vacuums combined systems were calculated at 30 feet in the various directions towards the identified noise-sensitive receptors.

TABLE 4 Noise Levels for the AeroDry Systems, LLC, Blower, the IVS Power Vacuums & the Combined Noise Levels

Distance	Noise Level, dB				
	AeroDry Systems Blower		IVS Power Vacuum	Combined Noise	
	Standard Deviation	100 ft. Direct		Standard Deviation	100 ft. Direct
5 feet	82.5	77.5	--	--	--
10 feet	81.5	76.5	75.0	82.4	78.8
20 feet	79.4	74.4	72.0	80.1	76.4
30 feet	75.9	70.9	67.0	76.4	72.4
40 feet	73.4	68.4	65.0	74.0	70.0
50 feet	71.4	66.4	65.0	72.3	68.8

To determine the more distant blower noise levels at the receptors, the rate of sound propagation between the operations at 30 feet and the noise sensitive receptor locations was established. For simple, single sources, such as fixed equipment, the divergence of the sound wave would be hemispherical in nature, producing a reduction of 6 dB with each doubling of the distance. Other effects can modify these fall-off rates, such as partial shielding from buildings or topography, atmospheric attenuation of sound, ground absorption, and meteorological effects. These effects almost always reduce the noise, in addition to that due to sound divergence. As most of these effects would vary with time due to changing environmental conditions, the most conservative approach would be to assume only attenuation due to divergence for outdoor activities. From these propagation calculations, the maximum noise levels (L_{max}) for the combined blower and vacuum systems were estimated at each noise-sensitive receptor in the vicinity of the project site. Table 5 summarizes these levels.

The hours of operation for the carwash would be limited to daytime hours (i.e., 7:00 a.m. to 10:00 p.m.). A conservative estimation for the number of vehicles to be washed in a day would be approximately 30 to 75 vehicles, with 80 vehicles in a day being considered a very successful day of business. Each vehicle would take approximately 1 to 2 minutes per wash/dry cycle. Considering these usage characteristics and the L_{max} noise levels shown in Table 4, the resulting

L_{dn} levels at the noise-sensitive receptors in the vicinity of the project can be determined. For this project, the AeroDry quiet dryer system was chosen. Following this analysis, Table 5 also shows the measured and calculated levels at the surrounding noise-sensitive receptors, assuming the AeroDry Systems quiet dryer system and the IVS Power Vacuums system are used. The predicted L_{dn} levels for the proposed carwash were calculated assuming the maximum of 80 carwashes per day and 1 minute per car for total drying time. A comparison of these operational L_{dn} levels to the measured L_{dn} at the same locations is useful in assessing the impact of the proposed project versus the noise exposure level limits established in the City's General Plan.

TABLE 5 L_{max} & L_{dn} Levels Calculated for the Quiet Dryer System at Noise-Sensitive Receptors in the Vicinity of the Carwash

Noise-Sensitive Receptor	Existing Measured Level (dB)		Calculated Level of Carwash (dB)		Noise Limit (dB)
	Day	Night	Day	Night	
Las Positas Gardens Townhomes: ~325 feet southwest of carwash exit	82	71	45	33	65
Townhomes on West Las Positas Boulevard: ~220 feet northeast of carwash entrance	72	59	44	31	65
Fire Station: ~225 feet northwest of carwash entrance	72	59	42	30	70
Commercial Restaurant: ~50 feet east of carwash entrance	77	64	52	39	70
Commercial Retail: ~185 feet south of carwash exit	74	63	57	45	70
Commercial Retail: ~160 feet southeast of carwash exit	74	63	56	44	70

NOISE IMPACTS AND MITIGATION MEASURES

Since the carwash operations will be limited to daytime only hours (i.e., 7:00 a.m. to 10:00 p.m.), the noise limits established by Section 9.04.035, *Noise Limits-Commercial or Industrial Use Adjacent to Residential Zone*, in the City of Pleasanton's Municipal Code Noise Ordinance do not apply to this impact study. However, Section 9.04.040, *Noise Limits – Commercial Property*, does apply to this impact study. Therefore, the impact criteria used in this study will focus on Section 9.04.040 of the municipal code, as well as the noise and land use compatibility and noise level increase criteria found in the City's General Plan Noise Element.

City of Pleasanton General Plan Noise Element

The noise levels at Las Positas Gardens Townhomes were predicted at the LT-1 location, which is southwest of the carwash exit. Predicted levels calculated at locations directly west of the proposed carwash would result in lower levels than those calculated in the southwest direction due to building and directionality shielding. Therefore, the results shown in Table 5 represent the worst-case scenario for the Las Positas Gardens Townhomes. As shown in Table 5, the calculated L_{max} and L_{dn} levels predicted at Las Positas Gardens Townhomes for the carwash operations would be lower than the existing measured levels. This indicates that the proposed

carwash would not significantly increase the noise environment for these noise-sensitive receptors, and therefore, the impact would be less-than-significant.

The townhomes to the northeast of the project site, which is based on calculations derived from the measurement results at location ST-1, are exposed to an existing L_{dn} level of 51 dBA. Unlike Las Positas Gardens Townhomes, these existing levels are below the 65 dBA L_{dn} , falling in the 'normally acceptable' limits for multi-family residential uses per the Noise Element noise and land use criterion. Operations of the proposed carwash are calculated to be approximately 31 dBA L_{dn} at these townhomes. This indicates that the operation of the proposed carwash would not impact the existing noise environment at these townhomes. The noise would not result in a significant impact on the townhomes to the northeast of the project site.

Similar existing levels were estimated for the fire station. At the time of measurement, activity at the fire station was minimal, so similar levels would be expected. Directly north of the proposed carwash is the eastern property line of the fire station and the parking area. Any outdoor areas surrounding the fire station where people would be exposed to the noise from the carwash would be located in the northwest direction of the entrance to the carwash. As stated earlier, this area of exposure is partially shielded from the 7-Eleven convenience store, but calculations were made assuming minimal to no shielding, which would reflect the worst-case scenario. The predicted levels at the fire station for the carwash operations would be approximately 42 dBA, L_{max} , and 30 dBA, L_{dn} , which is lower than the 70 dBA L_{dn} requirement established in the City's General Plan. This would be a less-than-significant impact.

The restaurant located on the northeast corner of the project site is not currently occupied. In the future, however, occupancy is expected. The estimation of the existing noise environment at this location may increase once there is consistent activity at the building. There would not, however, be a public, outdoor use area. The restaurant is approximately 50 feet east of the proposed carwash entrance and under existing conditions, the L_{dn} at the restaurant was approximately 64 dBA. Most of the existing sources of noise would be parking lot traffic for the surrounding commercial/retail land uses, the existing gas station and roadway traffic, and the existing automotive service shop. Based on perpendicular propagation of the proposed carwash noise levels from the entrance to the restaurant's front porch, the L_{max} would be considerably lower than the L_{max} measured under existing conditions. Likewise, the calculated L_{dn} is expected to be significantly below the existing L_{dn} levels. Therefore, the future environmental noise levels, as measured from the restaurant, would be expected to meet the exterior noise criterion in the General Plan. This would be a less-than-significant impact.

Two locations south and southeast of the project site were selected to represent the surrounding commercial/retail land uses. Based on the noise propagation patterns used in the analysis, the receptors located south of the source would receive the loudest noise levels from the carwash, and the receptors in the southeast direction would have the next loudest noise levels. For this reason, commercial/retail land uses approximately 185 feet south and 160 feet southeast of the proposed carwash exit were selected for evaluation. The existing measured values were approximated based on the LT-2 measurements. While the highest L_{max} noise level for these retail receptors were approximately 60 and 61 dBA, respectively, the L_{dn} noise levels were approximately 49 and 50 dBA, respectively. The calculated noise levels for the carwash operations, as measured at each of the retail receptors, would be 56 to 57 dBA, L_{max} , and 44 to 45

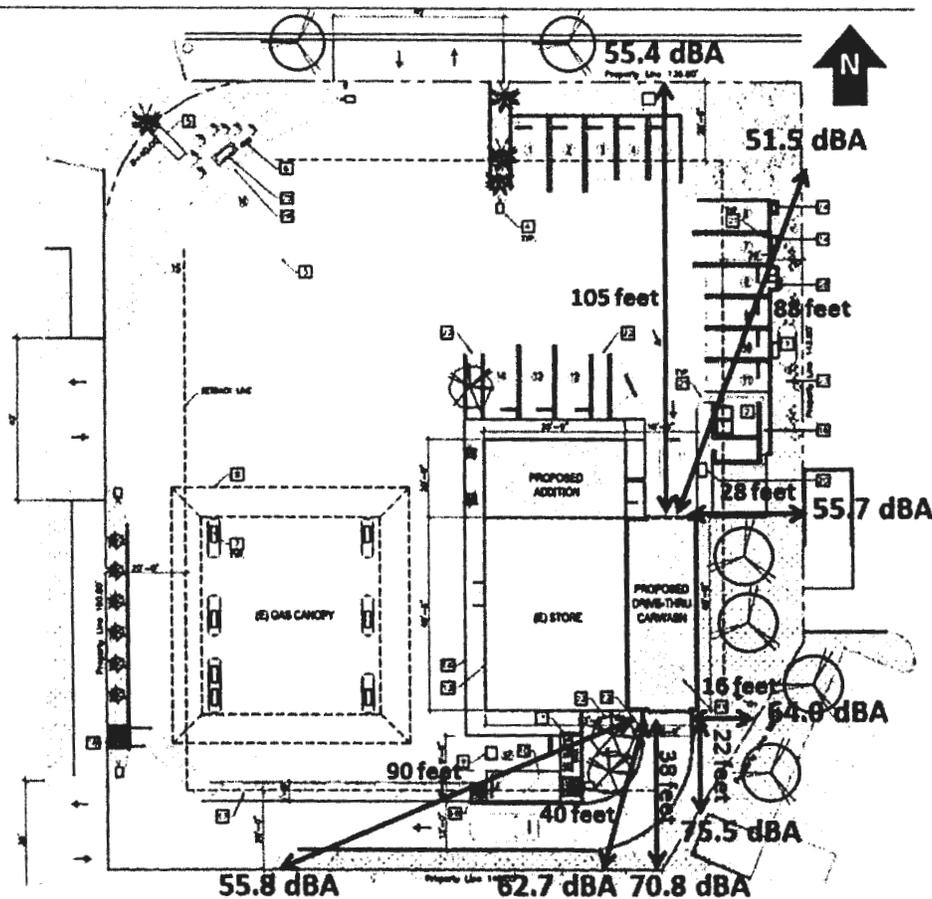
dBA, L_{dn} , which are approximately equivalent to the existing measured levels. These levels would meet the 70 dBA, L_{dn} , criterion for commercial receptors, as established in the City's General Plan. The impact at the commercial/retail land uses is less-than-significant.

Calculations were not made at the single-family residences located to the east of the commercial/retail land uses. The noise levels predicted for the commercial/retail land uses would meet the commercial and residential criteria established in the City's General Plan, and considering the shielding effects that these commercial/retail buildings have on the residential land uses behind them, the impact expected at the single-family residences to the east of the commercial/retail property would be less-than-significant.

City of Pleasanton Municipal Code Noise Ordinance

According to the Noise Ordinance established in the Municipal Code for the City of Pleasanton, if noise measured along the property plane of a commercial property exceeds 70 dBA, a significant impact has occurred. An exception can be made if any noise does not exceed 70 dBA at 25 feet under its noisiest conditions. Under this guideline, maximum noise levels at the property line of the 7-Eleven carwash project site must not exceed 70 dBA. In Figure 4, the proposed carwash site plans are labeled with noise levels calculated along the property line at various distances from the carwash entrance and exit, assuming the AeroDry quiet dryer system is used. These calculated levels were approximated based on the same estimation method used above in the Noise Element impact discussion. Note, noise levels along the western border of the property were not calculated due to the distance from the noise source and the shielding provided by the 7-Eleven convenient store; the levels measured along the western property line would be less-than-significant. As shown in Figure 4, levels along the northern and eastern property lines are expected to be below 70 dBA, L_{max} , and therefore, the impact at these locations would be less-than-significant. However, the noise levels calculated directly south of the carwash exit would exceed the 70 dBA L_{max} limit. The southern property line would range from 22 to 38 feet south of the carwash exit, with calculated levels ranging from 71 to 76 dBA L_{max} . This would be a significant impact. Once the propagating noise shifts from directly south to southwest, however, the noise levels drop below 70 dBA L_{max} , which would not be considered a significant impact at this location.

FIGURE 4 Noise Levels Calculated at Various Distances Along the Property Line



Mitigation Measure: Construction of a fence structure capable of reducing noise levels at the southern property line by 5 to 6 dBA. The height of this fence would be approximately 8 to 10 feet tall and would be located in the strip of lawn outside the boundary of the exit driveway.

While this project does not meet the conditions for the exception established in the Municipal Code for commercial property along the property plane, special circumstances for the 7-Eleven carwash project could be considered. The south and southeast property lines where the levels exceed the noise regulation are adjacent to parking spaces used for other commercial/retail use. Parking lots are not considered noise-sensitive. Furthermore, the noise generated from vehicles driving, stopping, and starting in a parking lot would be a source of noise. In fact, LT-2 was located along the southeastern border of the proposed carwash property, and during the daytime hours on weekdays and weekends, the existing noise environment resulted in L_{max} levels that were 74 dBA, which exceed the 70 dBA limit. If the existing noise environment already exceeds the limit and there are no expected changes to the surrounding land use, the City could write a special case exception for the proposed carwash.

If an exception is not feasible, noise mitigation measures would be required to reduce the noise 22 feet away by approximately 5 to 6 dBA. The only practical option would be a sound wall or a specially-designed wooden fence structure capable of reducing noise levels by 5 to 6 dBA. Based on the proposed plans for the 7-Eleven carwash, the clearance at the exit would have a height of eight feet; therefore, the minimum height for the proposed noise barrier would also need to be eight feet. The proposed noise barrier would start at the wall of the exit and extend slightly east, just outside the exit driveway of the carwash. Positioning the wall a few feet away from the edge of the exit driveway is recommended for the benefit of the carwash customers. The total length of the proposed noise barrier, which is shown in Figure 5, would be approximately 55 to 60 feet. The southernmost section of the proposed barrier extends beyond point of required mitigation due to the corner effects of noise barriers. This extension is recommended to ensure effectiveness of the sound mitigation measure.

The proposed noise barrier design consists of a fence with two solid wood layers rigidly connected. There should be no holes or gaps anywhere along either layer of wood. Furthermore, there should not be any gap where the fence touches the ground. All joints between the wooden boards or sheets of wood should be supported by structural elements or caulked. Additionally, a layer of sound-absorptive material could be applied between the two parallel wooden fence layers. An alternative design could include a sound wall of the same dimensions made out of stucco or blocks. Similar to the wooden fence design, sound walls made of these materials would also need to be solid, with no holes or gaps on the wall or at the base of the wall where it meets the ground. The total noise reduction that could be expected from both the proposed fence and the sound wall designs would be at least 5 to 6 dBA. Figure 5 shows the predicted noise levels just inside the proposed noise barrier and the distance at which these levels were calculated. Figure 6 shows the predicted noise levels at the south and southeast locations of the property line, assuming the 8- to 10-foot noise barrier was constructed as shown. A noise expert should be consulted during the final design phase of the project to confirm final design and dimensions.

FIGURE 5 Suggested Location for Proposed Noise Barrier and Predicted Noise Levels Calculated Just Inside the Noise Barrier

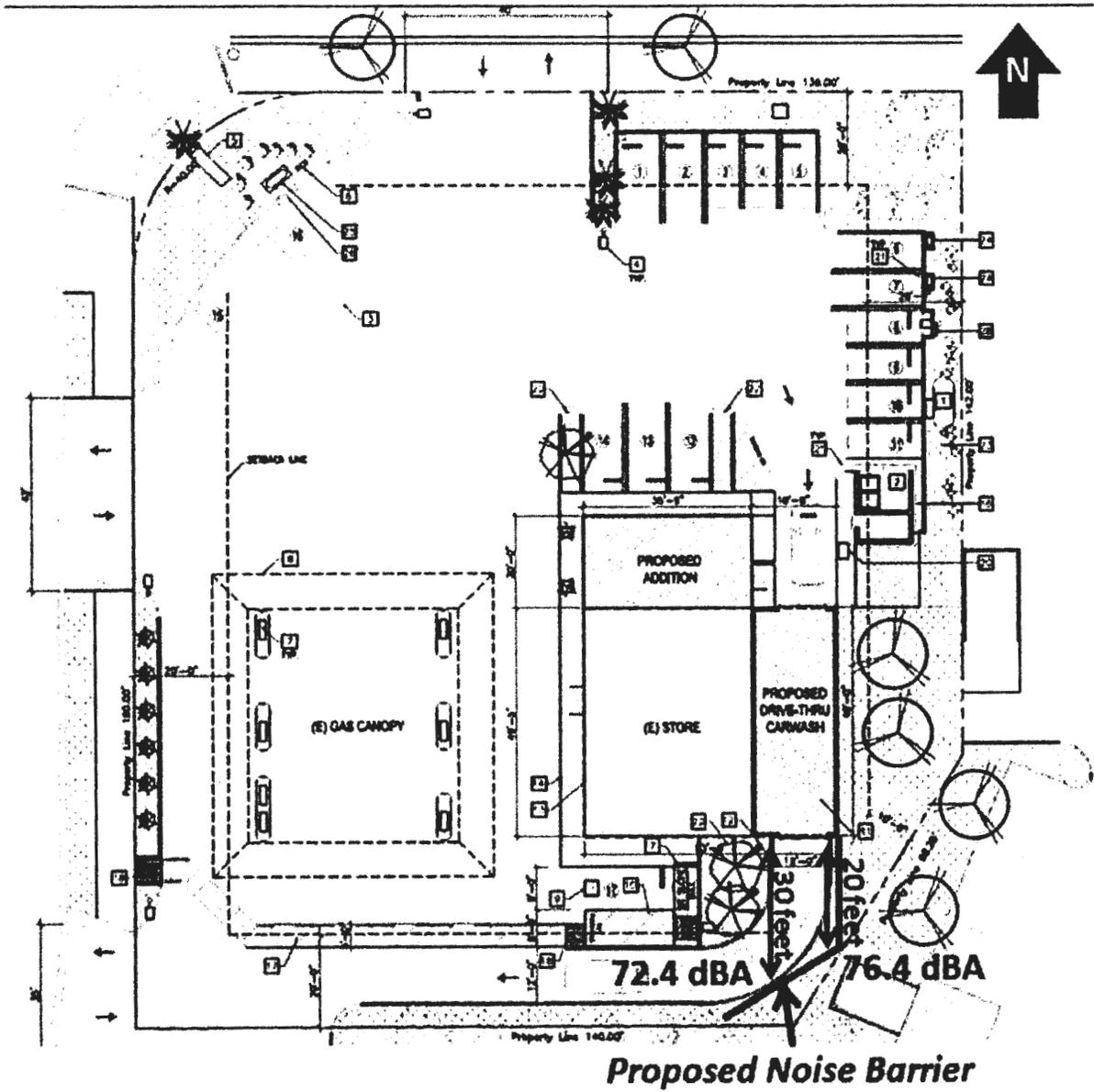


FIGURE 6 Suggested Location for Proposed Noise Barrier and Predicted Noise Levels Calculated at the Property Line

