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Acoustical Assessment

C-Store Replacement and New Car Wash Use Permit P23-00300-MOD
Planning Commission Hearing Date (May 7, 2025)

MEMORANDUM

To: Jennifer Kirby, Kimley-Horn and Associates, Inc.

From: Sophia LaHerran, Kimley-Horn and Associates, Inc.

Date: April 15, 2025

Subject: Chevron Angwin – Angwin, CA – Acoustical Assessment

Purpose

The purpose of this memorandum is to identify noise impacts associated with operations of the proposed site improvements at the existing Chevron fueling station (Project), located in Angwin, California in unincorporated Napa County (County).

Project Location

The Project site is located at 111 Howell Mountain Road, in Angwin, County of Napa. The Project site encompasses approximately 0.73 acre and is currently developed with the existing Chevron fueling center, and a now-vacant building. The Project site is approximately 4 miles west of State Route 128 (SR-128).

Project Description

The Project seeks to replace the existing vacant building, previously a convenience store and auto care shop, with a new 2,234 square foot (sf) expanded convenience store, and construct a one tunnel, 1,164 sf car wash. Additionally, the Project will also install a new trash enclosure and construct surface parking. Refer to **Exhibit 1: Site Plan**.

Convenience Store

The convenience store would consist of approximately 2,234 sf, generally located in the center portion of the Project site.

Car Wash

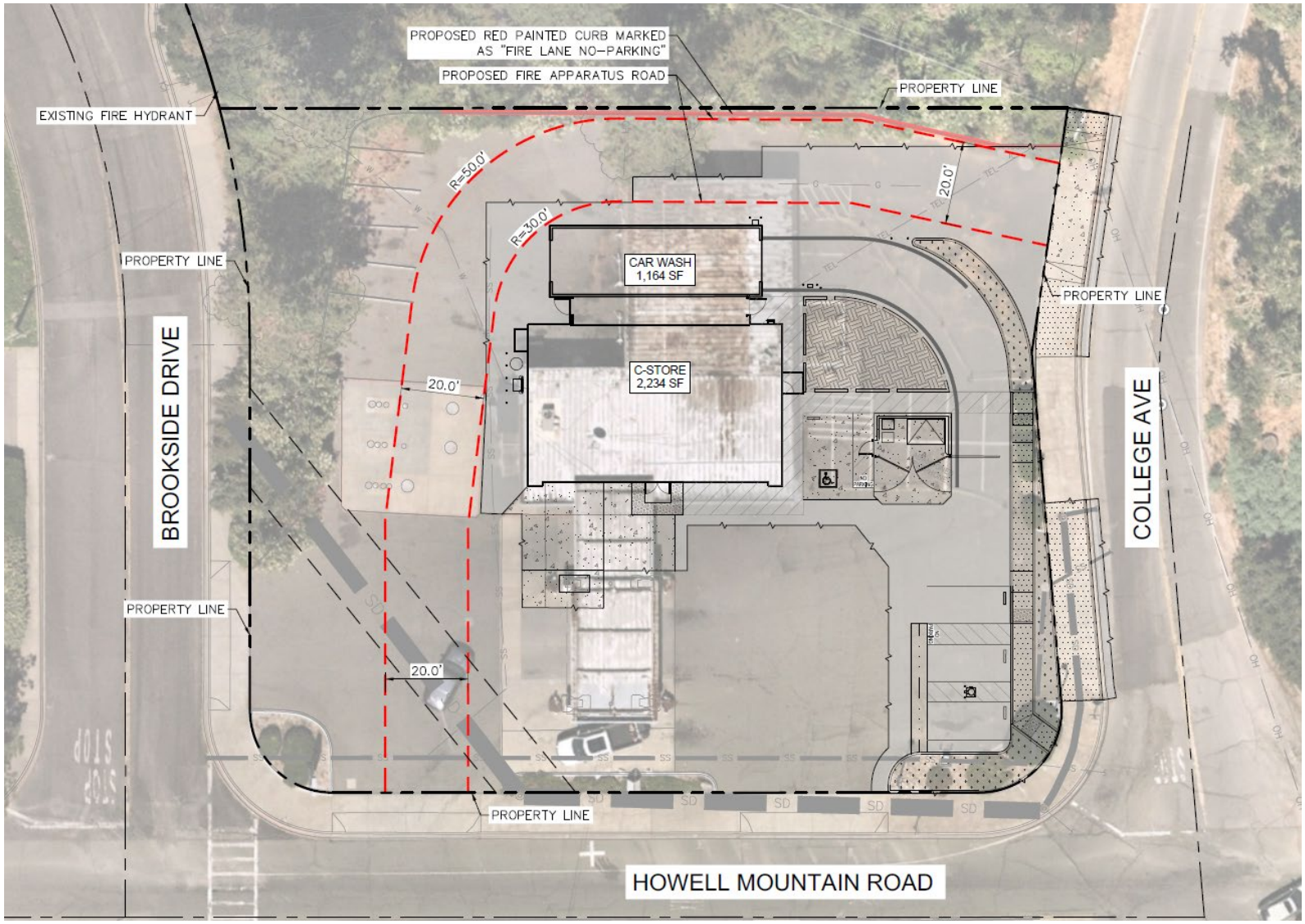
The approximate 1,164 sf automated drive-thru car wash would be located directly north of the convenience store. The car wash would include a conveyor wash tunnel with one dryer system. The car wash is anticipated to operate during daytime hours.

Project Parking and Circulation

The Project would provide three new parking stalls in the eastern portion of the site, and one converted ADA stall adjacent to the convenience store. The three proposed stalls located in the southeast corner of the site would feature a vacuum station between two stalls. The existing vehicle

parking stalls would remain in the northwest corner of the property. Vehicular access for the Project site would continue to be provided via two existing full access driveways on Howell Mountain Road and a full access driveway along Brookside Drive. A new full-access driveway is proposed on College Avenue to provide a fire access route around the car wash.

Exhibit 1: Site Plan



Noise Background

Sound is technically described in terms of amplitude (loudness) and frequency (pitch). The standard unit of sound amplitude measurement is the decibel (dB). The decibel scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound. The pitch of the sound is related to the frequency of the pressure vibration. Since the human ear is not equally sensitive to a given sound level at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) provides this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise, on the other hand, is typically defined as unwanted sound. A typical noise environment consists of a base of steady ambient noise that is the sum of various distant and indistinguishable noise sources. The sound from individual local sources is superimposed on this background noise. These can vary from an occasional aircraft or train passing by to virtually continuous noise from traffic on a major highway.

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise as well as the time of day when the noise occurs. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. While the equivalent continuous sound level (L_{eq}) represents the continuous sound pressure level over a given period; the Day-Night Sound level (L_{dn}) is a 24-hour average L_{eq} with a 10 dBA “weighting” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The Community Noise Equivalent Level (CNEL) is a 24-hour average L_{eq} with a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. and an additional 5 dBA weighting during the hours of 7:00 p.m. to 10:00 p.m. to account for noise sensitivity in the evening and nighttime.

Regulatory Setting

State

California Government Code

California Government Code Section 65302(f) 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 established 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" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

Title 24 – Building Code

The State's noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings, the acceptable interior noise limit for new construction is 45 dBA CNEL.

Regional

Napa County General Plan

The General Plan Community Character Element contains noise and land use compatibility standards for various land uses throughout the County; see **Table 1**: **Land Use Compatibility for Community Noise Environments**. The County uses these standards and criteria in the land use planning process to reduce future noise and land use incompatibilities. The standards shown in **Table 1** are the primary tool that allows the County to ensure integrated planning for compatibility between land uses and outdoor noise.

Table 1: Noise Compatibility Guidelines				
Land Use	**24-Hour Day-Night Average or L_{dn} (dBA)**			
	Completely Compatible	**Tentatively Compatible**	**Normally Incompatible**	**Completely Incompatible**
Residential	< 55	55-60	60-75	> 75
Commercial	< 65	65-75	75-80	> 80
Industrial	< 70	70-80	80-85	> 85

COMPLETELY COMPATIBLE: The specified land use is satisfactory and both the indoor and outdoor environments are pleasant.

TENTATIVELY COMPATIBLE: Noise exposure may be of concern, but common building construction practices will make the indoor living environment acceptable, even for sleeping quarters, and the outdoor environment will be reasonably pleasant.

NORMALLY INCOMPATIBLE: Noise exposure warrants special attention, and new construction or development should generally be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features are included in the design. Careful site planning or exterior barriers may be needed to make the outdoor environment tolerable.

COMPLETELY INCOMPATIBLE: Noise exposure is so severe that new construction or development should generally not be undertaken.

Source: Napa County, Napa County General Plan, p. CC-27, Noise Policies.

The General Plan Community Character Element contains the County's exterior noise standards and interior noise level criteria; see **Table 2: Exterior and Interior Noise Standards.**

Table 2: Exterior and Interior Noise Standards				
Land Use (Receptor Property) Type	**Time Period**	**Allowed Noise Level (dBA) by Noise Zone Classification[1]**		
		Rural	**Suburban**	**Urban**
Exterior				
Single-Family Homes and Duplexes	10:00 p.m. to 7:00 a.m.	45	45	50
	7:00 a.m. to 10:00 p.m.	50	55	60
Multiple Residential 3 or More Units Per Building (Triplex +)	10:00 p.m. to 7:00 a.m.	45	50	55
	7:00 a.m. to 10:00 p.m.	50	55	60
Office and Retail	10:00 p.m. to 7:00 a.m.	60		
	7:00 a.m. to 10:00 p.m.	65		
Industrial and Wineries	Anytime	75		
Interior				
Residential	10:00 p.m. to 7:00 a.m.	55		
	7:00 a.m. to 10:00 p.m.	60		

Source: Napa County, Napa County General Plan, p. CC-26, Noise Policies

1. The classification of different areas of the county in terms of environmental noise zones shall be determined by the NCO, based upon assessment of county noise survey data. Industrial noise limits are intended primarily for use at the boundary of industrial zones rather than for noise reduction within the zone

Napa County Code of Ordinances

Chapter 8.16 (Noise Control Regulations) of the Napa County Code of Ordinances (COO) establishes standards to protect the health, safety, and welfare of those living and working in the County and to implement policies of the General Plan Noise Element. Sections 8.16.060 and 8.16.070 of the County's COO establish noise limits for various land uses as outlined in the General Plan, see **Table 2**. Section 8.16.070 states that a significant noise level would occur if the Project would exceed:

a) The noise standard for that land use as specified in **Table 2** for a cumulative period of more than thirty minutes in any hour;
b) The noise standard plus five dB for a cumulative period of more than fifteen minutes in any hour;
c) The noise standard plus ten dB for a cumulative period of more than five minutes in any hour;
d) The noise standard plus fifteen dB for a cumulative period of more than one minute in any hour;
e) The noise standard plus twenty dB or the maximum measured ambient level, for any period of time.

Additionally, Section 8.16.080 details specific types of noise prohibited, including loading and unloading during nighttime hours (10:00 p.m. to 6:00 a.m.).

Existing Setting

The Project site is impacted by various noise sources. Mobile sources of noise, including traffic along Howell Mountain Road to the south, Brookside Road to the west, and College Avenue to the east are the most common and prominent sources of noise in the Project area. The primary sources of stationary noise near the Project site include parking lot noise at the nearby commercial properties, mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] units) operating at the nearby commercial and residential uses, and other urban-related activities (e.g., idling cars/trucks, pedestrians, car radios and music playing, dogs barking, etc.). The noise associated with these sources may represent a single-event noise occurrence or short-term noise.

Noise Measurements

To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements on August 29, 2024, see **Appendix A: Nosie Data**. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site, see **Exhibit 2: Noise Measurement Locations**. The 10-minute measurements were taken between 2:20 p.m. and 3:30 p.m. Short-term L_{eq} measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in **Table 3: Existing Noise Measurements**.

Table 3: Existing Noise Measurements					
Site	**Location**	**L_{eq} (dBA)**	**L_{min} (dBA)**	**L_{max} (dBA)**	**Time**
1	Adjacent to Brookside Park Pacific Union College Housing, off of Brookside Drive to the west of the Project site.	49.3	41.9	64.5	2:52 p.m.
2	Southwest corner of Howell Mountain Road and Hardin Lane intersection.	63.5	47.0	76.2	3:06 p.m.
3	Adjacent to retail uses along Howell Mountain Road, to the east of the Project site.	66.8	48.2	85.7	2:36 p.m.
4	In the parking lot south of Hardin Lane, southeast of the Project site.	50.4	41.0	60.6	2:22 p.m.
Source: Noise measurements taken by Kimley-Horn and Associates, August 29, 2024. See **Appendix A** for noise measurement results.					

Sensitive Receptors

Noise exposure standards and guidelines for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Residences, hospitals, schools, guest lodging, libraries, and churches are treated as the most sensitive to noise intrusion and therefore have more stringent noise exposure targets than do other uses, such as manufacturing or agricultural uses that are not subject to impacts such as sleep disturbance. Sensitive receptors near the Project site are shown in **Table 4: Sensitive Receptors**.

Table 4: Sensitive Receptors	
Receptor Description	**Distance and Direction from the Project Site[1]**
Multi-Family Residential	100 feet to the west
Pacific Union College	280 feet east
Single Family Residential	425 feet to the north
1. Distances are measured from the Project site boundary to the sensitive receptor property line.	
Source: Google Earth, 2024	

Exhibit 2: Noise Measurement Locations

Operational Noise Impacts

As shown on Figure AG/LU-32 of the Napa County General Plan, the residences to the west of the Project site are designated Urban Residential and the residences to the north are designated Rural Residential.[1] Moreover, the Project site is situated within a developed urban environment, characterized by commercial and institutional land uses immediately to the east and south. Therefore, the County's daytime (60 dBA) and nighttime (50 dBA) exterior noise standards for urban residential uses and the County's daytime (50 dBA) and nighttime (45 dBA) exterior noise standards for rural residential uses are utilized in this analysis. Additionally, the County's daytime (65 dBA) and nighttime (60 dBA) exterior noise standards were utilized for the retail uses.

On-Site Operations

Implementation of the proposed Project would create new sources of noise in the Project vicinity. The major noise sources associated with the Project that would potentially impact existing nearby residences include stationary noise equipment (i.e., air conditioners, car wash vacuum and dryer system, etc.); parking areas (i.e., car door slamming, car radios, engine start-up, and car pass-by); truck deliveries and trash/recycling pickups; convenience store operations; and off-site traffic noise. A discussion of each of these Project noise sources is provided below.

Mechanical Equipment. Potential stationary noise sources related to the long-term operation of the Project would include mechanical equipment. Mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA at 50 feet.[2] HVAC units would be located as close as 175 feet from the property line of the multi-family residences to the west and 495 feet from the single-family residences to the north. HVAC units would also be located as close as 160 feet from the retail uses to the east. Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the source. As a result, HVAC noise levels would attenuate by distance to approximately 41 dBA and 32 dBA at the nearest residences to the west and north, respectively and 42 dBA at the retail uses. Therefore, HVAC noise would not exceed the County's daytime exterior noise standard of 60 dB for urban residential uses, 50 dB for rural residential uses, or 65 dB for retail uses. Impacts from mechanical equipment would be less than significant.

Car Wash Operations. The automated drive-thru car wash would include a conveyor wash tunnel with one dryer system and would not include speakers or intercoms. Car wash operations would occur during daytime hours, in accordance with Section 8.16.070 of the County's COO. The Project would utilize one AquaDri FS-40 dryer system. The AquaDri FS-40 dryer system generates 98 dBA at a distance of 10 feet from the source when the outside door is open. **Table 5: Car Wash Dryer Noise Levels** shows the car wash noise level at the nearest sensitive receptors.

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[1] Napa County General Plan, *Agricultural Preservation and Land Use Element*, June 2008. Accessed at https://www.countyofnapa.org/DocumentCenter/View/3331/Agricultural-Preservation-and-Land-Use-Element-PDF.

[2] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, 2015.

As shown in **Table 5**, car wash dryer operations would generate a noise level of approximately 57 dBA at the multi-family residential uses to the west and 49 dBA at the single-family residential uses to the north. Additionally, car wash dryer operations would generate a noise level of approximately 57 dBA at the retail uses to the east. The car wash would not exceed the County's daytime exterior noise standard of 60 dB for urban residential uses, 50 dB for rural residential uses, or 65 dB for retail uses. Further, the car wash would not operate after 9:00 p.m. and therefore would not exceed the County's nighttime (9:00 p.m. to 7:00 a.m.) noise standards. Therefore, noise levels generated by car wash operations would be less than significant.

Table 5: Car Wash Noise Levels

Receptor	Source	Reference Noise Level (dBA)[1]	Reference Distance (feet)	Nearest Receptor Distance from Source (feet)[2]	Building Row Attenuation (dBA)[3]	Modeled Exterior Noise Level at Nearest Sensitive Receptor (dBA)
Multi-family Residential Uses to the West	Dryers	98	10	200	15	57.0
					Noise Threshold (dBA)[4]	*60*
					Threshold Exceeded?	***No***
Single-family Residential Uses to the North	Dryers	98	10	495	15	49.1
					Noise Threshold (dBA)[4]	*50*
					Threshold Exceeded?	***No***
Retail Uses to the East	Dryers	98	10	190	15	57.4
					Noise Threshold (dBA)[4]	*65*
					Threshold Exceeded?	***No***

1. Noise level specifications for the dryer system were provided by the Applicant. Refer to **Appendix A**.
2. The nearest sensitive receptors are the multi-family residential uses to the west.
3. Building row attenuation assumes partial obstruction as the dryers would be inside the car wash building. Refer to **Appendix A** for barrier calculations.
4. The car wash would operate during daytime hours, between 7:00 a.m. to 9:00 p.m. The County's daytime exterior noise standards for rural residential uses (50 dBA), urban residential uses (60 dBA) and commercial uses (65 dBA) were utilized. See Napa County Code of Ordinance Section 8.16.070 A.2.b.

Truck Deliveries and Trash/Recycling Collection. It is anticipated that the proposed Project would involve occasional deliveries (i.e., deliveries of gasoline, diesel, and supplies for the convenience store) and weekly trash/recycling collection from slow-moving trucks during daylight hours. This analysis does not consider nighttime deliveries per Section 8.16.080 of the County's COO. The primary noise source associated with trucks are the air brakes, engine idling, back up alarms, engine ignition, and acceleration. Once the trucks have pulled into the parking lot, the unloaded activities would be conducted using a hand cart, and most of the unloading noise would be contained within the truck trailer. It should be noted that per the California Code of Regulations, Title 13, Section 2485, trucks would be prohibited from idling more than five minutes.

The Project site is currently developed with a fueling station; therefore, fueling truck deliveries occur at the site under existing conditions. Delivery truck noise levels were calculated for the Project based on reference truck noise levels and the inverse square law of sound propagation. Truck unloading related noises would occur for brief periods during the delivery process. For example, air brake and backup alarm noises last a few seconds and idling would be limited to five minutes. Truck unloading

would have the longest duration and would make up the majority of the time during each delivery event. **Table 6: Delivery Truck Noise**, provides the delivery truck noise levels at the Project property line near the closest sensitive receptors.

Table 6: Delivery Truck Noise

Receptor	Source	Reference Noise Level (dBA)[1]	Reference Distance (feet)	Nearest Receptor Distance from Source (feet)[2]	Duration[4]	Modeled Exterior Noise Level at Nearest Sensitive Receptor (dBA)
Multi-family Residential Uses to the West	Trucks	64	50	200	5 minutes	52.4
					Noise Threshold (dBA)[3]	*60*
					Threshold Exceeded?	***No***
Single-family Residential Uses to the North	Trucks	64	50	450	5 minutes	45.3
					Noise Threshold (dBA)[3]	*50*
					Threshold Exceeded?	***No***
Retail Uses to the East	Trucks	64	50	100	5 minutes	58.4
					Noise Threshold (dBA)[3]	*65*
					Threshold Exceeded?	***No***

1. Loading dock reference noise level measurements conducted by Kimley-Horn on December 18, 2018 at the La Palma Neighborhood Walmart, approximately 50 feet from the Walmart loading dock area. Loading dock activities included trucks arriving at the docks, backing up, and loading/unloading using pallet jacks.
2. This is the distance measured from the existing re-fueling area/delivery area to the property line of the sensitive receptors. The nearest sensitive receptors are the multi-family residential uses to the west.
3. The County's daytime exterior noise standards for rural residential uses (50 dBA), urban residential uses (60 dBA) and commercial uses (65 dBA) were utilized. See Napa County Code of Ordinance Section 8.16.070 A.2.b.
4. It should be noted that trucks would not idle for more than five minutes at any given time per trip per California Code of Regulations, Title 13, Section 2485.

As shown in **Table 6**, the combined delivery truck noise levels would be 52 dBA L_{eq} at the multi-family residential uses to the west and 45 dBA L_{eq} at the single-family residential uses to the north. Additionally, the combined delivery truck noise levels would be 58 dBA L_{eq} at the retail uses to the east. It should be noted that trucks would not idle for longer than five minutes upon entering or leaving the site as per California Code of Regulations, Title 13, Section 2485. Therefore, delivery truck noise levels would not exceed the County's daytime exterior noise standard of 60 dB for urban residential uses, 50 dB for rural residential uses, or 65 dB for retail uses.

Delivery times are currently unknown; however, the Project would comply with Section 8.16.080 of the County's COO which prohibits loading activities during the nighttime hours (10:00 p.m. to 6:00 a.m.). In addition, truck deliveries and trash/recycle collection activities occur at the adjacent commercial retail uses under existing conditions, and traffic noise along Howell Mountain Road and Brookside Drive would act as a buffer from on-site truck noise levels. Therefore, potential noise impacts associated with deliveries and trash/recycling would be less than significant and no mitigation would be required.

Parking Lot, Vacuum, and Air Machine Noise. The Project would provide eight parking stalls, located throughout the Project site. Traffic associated with parking lots is typically not of sufficient volume

to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 53 to 61 dBA.[3] Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech.[4] It should be noted that parking lot noises are instantaneous noise levels compared to noise standards in the hourly L_{eq} or 24-hour CNEL metrics, which are averaged over the entire duration of a time period. As a result, actual noise levels over time resulting from parking lot activities would be far lower than the reference levels identified above.

The nearest parking spaces are currently approximately 150 feet from the multi-family residential uses to the west, 480 feet from the single-family residences to the north, and 120 feet from the retail uses to the east. The Project is proposing three new spaces in the northeast corner of the Project site, to provide access to a new vacuum proposed between the stalls as well as provide access to an existing air machine. The addition of three parking spaces would not generate parking noise levels that would cause an increase of noise above County standards. Additionally, a standard car wash vacuum unit generates 72 dBA at a distance of 10 feet.[5] Based strictly on distance attenuation from the newly proposed stalls, vacuum noise would be approximately 42 dBA and 38 dBA at the nearest residences to the west and north, respectively and 50 dBA at the retail uses. Therefore, parking lot noise would be below the County's daytime exterior noise standard of 60 dB for urban residential uses, 50 dB for rural residential uses, or 65 dB for retail uses. Further, the air machine on site is existing and would not provide a new source of noise associated with the Project. Therefore, noise impacts from parking lot features would be less than significant.

Gas Station Noise. The proposed Project site is currently developed with an existing Chevron gas station. The gas station fueling would remain operational as part of the Project and would not be altered as a result of any other Project features. As such, no new or increased noise impacts are expected as a result of gas station use. Therefore, no new or more significant impacts would occur in this regard.

Combined Operational Noise Levels. Project operational noise was combined and weighted over a 30-minute period over an hour to determine consistency with Napa County Code of Ordinance Noise Standards. Noise levels at the nearest sensitive receptor to the Project site were calculated using the sources described above, see **Appendix A**. The worst-case combined daytime noise levels would be 57 dBA at the multi-family residential to the west and 49 dBA at the single-family residential to the north. The worst-case combined daytime noise levels would be 58 dBA at the retail uses to the east. Therefore, the combined operational noise levels would not exceed the County's daytime exterior noise standard of 60 dB for urban residential uses, 50 dB for rural residential uses, or 65 dB for retail uses.

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[3] Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

[4] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden. Noise Navigator Sound Level Database with Over 1700 Measurement Values, 2015.

[5] Ibid.

Off-Site Traffic Noise. The proposed Project could result in additional traffic on adjacent roadways from daily activities, thereby increasing vehicular noise in the vicinity of existing and proposed land uses. In general, a traffic noise increase of less than 3 dBA is barely perceptible to people, while a 5-dBA increase is readily noticeable.[6] Generally, traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to increase by 3 dBA. Therefore, permanent increases in ambient noise levels of less than 3 dBA are considered to be less than significant.

The major roads surrounding the Project site include Brookside Drive, College Avenue, and Howell Mountain Road, which are all designated Collector Roads in the Napa County General Plan. According to the Napa County Road and Street Standards, Collector Roads have an estimated 1,000 to 5,000 vehicles per day. Per the Chevron Angwin Trip Generation Memorandum prepared by Kimley-Horn in July 2024, the Project is anticipated to add 99 net new daily trips. Therefore, it is not anticipated the Project trips would exceed the 3 dBA CNEL threshold. As a result, the Project would not result in a perceptible increase in traffic noise levels and impacts would be less than significant.

Conclusion

Project implementation would result in less than significant operational noise impacts. No mitigation measures would be required. Therefore, the proposed Project would not result in significant effects related to noise.

[6] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol,* 2013.

REFERENCES

1. California Department of Transportation. Technical Noise Supplement to the Traffic Noise Analysis Protocol. 2013.

2. County of Napa. General Plan. 2008.

3. _____. Code of Ordinances.

4. _____. Road and Street Standards. 2023.

5. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden. Noise Navigator Sound Level Database with Over 1700 Measurement Values. 2015.

6. Kariel, H. G. Noise in Rural Recreational Environments. Canadian Acoustics 19(5), 3-10. 1991.

Appendix A

Noise Data

Noise Measurement Field Data

Project:	Chevron Napa	**Job Number:**	
Site No.:	ST-1	**Date:**	8/22/2024
Analyst:	Mia Berg	**Time:**	2:52 PM
Location:	Adjacent to Brookside Park Pacific Union College Housing, off of Brookside Drive		
Noise Sources:	occasional car		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
49.3	41.9	64.5	81.9

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	76
Wind (mph):	13
Sky:	Clear
Bar. Pressure:	29.85
Humidity:	46%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.143.s	Computer's File Name	LxTse_0006073-20240822 145206-LxT_Data.143.ldbin
Meter	LxT SE 0006073	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-08-22 14:52:06	Duration	0:10:00.0		
End Time	2024-08-22 15:02:06	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-08-20 14:57:35	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	49.3 dB		
LAE	77.1 dB	SEA	--- dB
EA	5.7 µPa²h		
LA_{peak}	81.9 dB	2024-08-22 14:57:13	
LAS_{max}	64.5 dB	2024-08-22 14:57:14	
LAS_{min}	41.9 dB	2024-08-22 14:59:41	
LA_{eq}	49.3 dB		
LC_{eq}	63.9 dB	LC_{eq} - LA_{eq}	14.6 dB
LAI_{eq}	50.7 dB	LAI_{eq} - LA_{eq}	1.4 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
49.3 dB	49.3 dB	0.0 dB

LDEN	LDay	LEve	LNight
49.3 dB	49.3 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	49.3 dB		63.9 dB		--- dB	
$LS_{(max)}$	64.5 dB	2024-08-22 14:57:14	--- dB	None	--- dB	None
$LS_{(min)}$	41.9 dB	2024-08-22 14:59:41	--- dB	None	--- dB	None
$L_{Peak(max)}$	81.9 dB	2024-08-22 14:57:13	--- dB	None	--- dB	None

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	52.6 dB
LAS 10.0	50.8 dB
LAS 33.3	48.3 dB
LAS 50.0	47.1 dB
LAS 66.6	45.7 dB
LAS 90.0	43.3 dB

Noise Measurement Field Data

Project:	Chevron Napa	**Job Number:**	
Site No.:	ST-2	**Date:**	8/22/2024
Analyst:	Mia Berg	**Time:**	3:06 PM
Location:	Southwest corner of Howell Mountain Road and Hardin Lane intersection		
Noise Sources:	occasional car		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
63.5	47	76.2	91.1

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	74
Wind (mph):	14
Sky:	Clear
Bar. Pressure:	29.85
Humidity:	46%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.144.s	Computer's File Name	LxTse_0006073-20240822 150657-LxT_Data.144.ldbin
Meter	LxT SE 0006073	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-08-22 15:06:57	Duration	0:10:00.0		
End Time	2024-08-22 15:16:57	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-08-20 14:57:35	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	63.5 dB		
LAE	91.3 dB	SEA	--- dB
EA	149.2 µPa²h		
LA_{peak}	91.1 dB	2024-08-22 15:13:37	
LAS_{max}	76.2 dB	2024-08-22 15:13:38	
LAS_{min}	47.0 dB	2024-08-22 15:15:45	
LA_{eq}	63.5 dB		
LC_{eq}	70.0 dB	LC_{eq} - LA_{eq}	6.5 dB
LAI_{eq}	64.7 dB	LAI_{eq} - LA_{eq}	1.2 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
63.5 dB	63.5 dB	0.0 dB

LDEN	LDay	LEve	LNight
63.5 dB	63.5 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	63.5 dB		70.0 dB		--- dB	
$LS_{(max)}$	76.2 dB	2024-08-22 15:13:38	--- dB	None	--- dB	None
$LS_{(min)}$	47.0 dB	2024-08-22 15:15:45	--- dB	None	--- dB	None
$L_{Peak(max)}$	91.1 dB	2024-08-22 15:13:37	--- dB	None	--- dB	None

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	69.3 dB
LAS 10.0	68.0 dB
LAS 33.3	62.4 dB
LAS 50.0	58.8 dB
LAS 66.6	53.8 dB
LAS 90.0	49.7 dB

Noise Measurement Field Data

Project:	Chevron Napa	**Job Number:**	
Site No.:	ST-3	**Date:**	8/22/2024
Analyst:	Mia Berg	**Time:**	2:36 PM
Location:	Adjacent to retail uses along Howell Mountain Road		
Noise Sources:	retail		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
66.8	48.2	85.7	102.7

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	75
Wind (mph):	13
Sky:	Clear
Bar. Pressure:	29.85
Humidity:	46%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.142.s	Computer's File Name	LxTse_0006073-20240822 143616-LxT_Data.142.ldbin
Meter	LxT SE 0006073	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-08-22 14:36:16	Duration	0:10:00.0		
End Time	2024-08-22 14:46:16	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-08-20 14:57:35	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	66.8 dB		
LAE	94.6 dB	SEA	--- dB
EA	319.1 µPa²h		
LA_{peak}	102.7 dB	2024-08-22 14:36:37	
LAS_{max}	85.7 dB	2024-08-22 14:36:37	
LAS_{min}	48.2 dB	2024-08-22 14:36:52	
LA_{eq}	66.8 dB		
LC_{eq}	75.2 dB	LC_{eq} - LA_{eq}	8.4 dB
LAI_{eq}	69.1 dB	LAI_{eq} - LA_{eq}	2.3 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	1	0:00:03.10
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
66.8 dB	66.8 dB	0.0 dB

LDEN	LDay	LEve	LNight
66.8 dB	66.8 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	66.8 dB		75.2 dB		--- dB	
$LS_{(max)}$	85.7 dB	2024-08-22 14:36:37	--- dB	None	--- dB	None
$LS_{(min)}$	48.2 dB	2024-08-22 14:36:52	--- dB	None	--- dB	None
$L_{Peak(max)}$	102.7 dB	2024-08-22 14:36:37	--- dB	None	--- dB	None

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	69.6 dB
LAS 10.0	66.8 dB
LAS 33.3	62.3 dB
LAS 50.0	59.9 dB
LAS 66.6	58.0 dB
LAS 90.0	53.1 dB

Noise Measurement Field Data

Project:	Chevron Napa	**Job Number:**	
Site No.:	ST-4	**Date:**	8/22/2024
Analyst:	Mia Berg	**Time:**	2:22 PM
Location:	In parking lot south of Hardin Lane		
Noise Sources:	trucks		
Comments:			

Results (dBA):

Leq:	Lmin:	Lmax:	Peak:
50.4	41.0	60.6	84.8

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	75
Wind (mph):	13
Sky:	Clear
Bar. Pressure:	29.85
Humidity:	46%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.141.s	Computer's File Name	LxTse_0006073-20240822 142243-LxT_Data.141.ldbin
Meter	LxT SE 0006073	Firmware	2.404
User		Location	
Job Description			
Note			

Start Time	2024-08-22 14:22:43	Duration	0:10:00.0		
End Time	2024-08-22 14:32:43	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-08-20 14:57:35	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA_{eq}	50.4 dB		
LAE	78.2 dB	SEA	--- dB
EA	7.3 µPa²h		
LA_{peak}	84.8 dB	2024-08-22 14:22:46	
LAS_{max}	60.6 dB	2024-08-22 14:23:25	
LAS_{min}	41.0 dB	2024-08-22 14:24:36	
LA_{eq}	50.4 dB		
LC_{eq}	66.9 dB	LC_{eq} - LA_{eq}	16.5 dB
LAI_{eq}	52.0 dB	LAI_{eq} - LA_{eq}	1.6 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApk > 135.0 dB	0	0:00:00.0
LApk > 137.0 dB	0	0:00:00.0
LApk > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
50.4 dB	50.4 dB	0.0 dB

LDEN	LDay	LEve	LNight
50.4 dB	50.4 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	50.4 dB		66.9 dB		--- dB	
$LS_{(max)}$	60.6 dB	2024-08-22 14:23:25	--- dB	None	--- dB	None
$LS_{(min)}$	41.0 dB	2024-08-22 14:24:36	--- dB	None	--- dB	None
$L_{Peak(max)}$	84.8 dB	2024-08-22 14:22:46	--- dB	None	--- dB	None

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	55.8 dB
LAS 10.0	53.9 dB
LAS 33.3	50.2 dB
LAS 50.0	48.1 dB
LAS 66.6	45.3 dB
LAS 90.0	42.6 dB

Car Wash Dryer

Receptor	Noise Level	Reference Dist. (feet)	Dist. to Property Line (feet)	Building Row	Distance Attenuation
West	98	10	200	15	57.0
East	98	10	190	15	57.4
North	98	10	495	15	49.1

Building row attenuation assumes partial obstruction as the dryers would be inside the car wash building.

Barrier/Intervening Structure

Distance Calculation

$d_1 = \sqrt{h^2} + d_3^2$

$d_2 = \sqrt{h^2} + (d - d_3)^2$

h =	5	barrier height above point D
d_3 =	3.28	segement of d between the source and the barrier
d =	238	distance between the source and receiver

d1 =	5.97983
d2 =	234.773

Fresnel Number Calculation

$$N = \frac{2}{w}(d_1 + d_2 - d)$$

N =	8.31244	Fresnel Number
w =	0.6624	wavelength
d_1 =	5.97983	distance between source and top of the barrier
d_2 =	234.773	distance between receiver and top of the barrier
d =	238	distance between the source and receiver
d_3 =	3.28	segement of d between the source and the barrier

Car Wash Vacuum

RECEPTOR	Noise Source	Reference Level (dBA)	Reference Distance (feet)	Distance to Receptor (feet)	Level at Receptor (dBA)[4]	Significant?
West	Car Wash Vacuum[7]	72	10	310	42.2	No
East	Car Wash Vacuum[7]	72	10	120	50.4	No
North	Car Wash Vacuum[8]	72	10	480	38.4	No

Decibel Addition: $L = 10\,Log_{10}(\sum_{i=1}^{n} 10^{\frac{Li}{10}})$

n 1	57.0 Car Wash dryer system at sensitive receptor to west	49.1 Car Wash dryer system at sensitive receptor to north	57.4 Car Wash dryer system east
n 2	42.2 Car Wash vacuum at sensitive receptor to west	38.1 Car Wash vacuum at sensitive receptor to north	50.4 Car Wash vacuum east
n 3			
n 4			
n 5			
n 6			
n 7			
n 8			
n 9			
n 10			
n 11			
n 12			
n 13			
n 14			
n 15			
n 16			
n 17			
n 18			
n 19			
n 20			
n 21			
n 22			
n 23			
n 24			
n 25			
n 26			
n 27			
n 28			
	57.1	49.4	58.2

Truck Delivery Idling

Receptor	Noise Level	Reference Dist. (feet)	Dist. to Property Line (feet)	Building Row	Distance Attenuation	Duration (minutes)
West	64.4	50	200	0	52.4	5
East	64.4	50	100	0	58.4	5
North	64.4	50	450	0	45.3	6