

Environmental Noise Assessment

Automatic Car Wash – 22235 Mission Boulevard

Hayward, California

BAC Job #2025-036

Prepared For:

Bubble Machine, LLC

Attn: Prem Kumar
379 Gridley Court
San Jose, CA 95127

Prepared By:

Bollard Acoustical Consultants, Inc.



Dario Gotchet
Principal Consultant
Board Elected Member, INCE-USA (ID#20964)

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Introduction

An existing self-serve car wash facility is located at 22235 Mission Boulevard in Hayward, California (APN: 428-0036-058-01). The project consists of the addition of an automatic car wash bay at the existing facility. Existing land uses within the immediate project vicinity include commercial businesses and residences. The project parcel, adjacent properties, and location of the proposed automatic car wash bay are shown in Figure 1.

The project applicant is pursuing a conditional use permit (CUP) with the City of Hayward for the addition of the automatic car wash bay. As part of the CUP approval process, City planning staff has requested that a noise study be prepared to ensure compliance with applicable Municipal Code noise level standards at adjacent properties. In response to that requirement, Bollard Acoustical Consultants, Inc. (BAC) was retained to prepare this noise analysis. Specifically, the purposes of this assessment are to quantify noise levels associated with the proposed automatic car wash bay, to assess the state of compliance of those noise levels with applicable City of Hayward noise standards, and if necessary, to recommend measures to reduce those noise levels to acceptable limits.

Noise Fundamentals and Terminology

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and thus are called sound. Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness. Appendix A contains definitions of Acoustical Terminology. Figure 2 shows common noise levels associated with various sources.

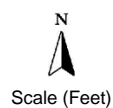
The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. All noise levels reported in this section are in terms of A-weighted levels in decibels.

Community noise is commonly described in terms of the “ambient” noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given time period (usually one hour). The L_{eq} is the foundation of the Day-Night Average Level noise descriptor, DNL (or L_{dn}), and shows very good correlation with community response to noise.



Legend

— Parcel Boundaries



Scale (Feet)

0 25 50

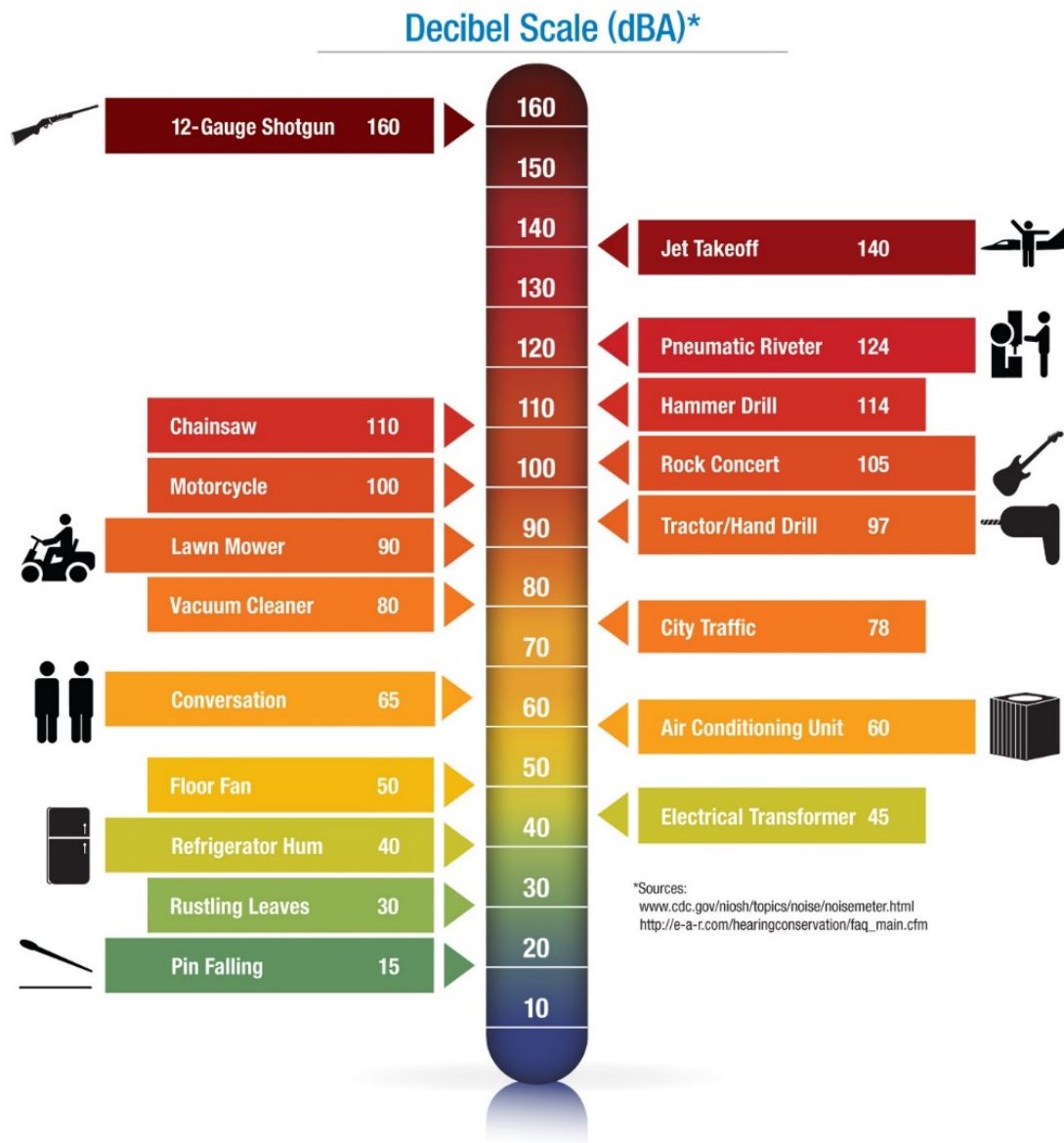
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Project Parcel & Adjacent Land Uses

Figure 1



Figure 2
Typical A-Weighted Sound Levels of Common Noise Sources



DNL is based upon the average noise level over a 24-hour day, with a +10-decibel weighting applied to noise occurring during nighttime hours (10:00 p.m. to 7:00 a.m.). The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment. DNL-based noise standards are commonly used to assess noise impacts associated with traffic, railroad, and aircraft noise sources.

Criteria for Acceptable Noise Exposure

Hayward Municipal Code

The provisions of the Hayward Municipal Code of relevance to this noise analysis for the project are reproduced below.

4-1.03.1 – Noise restriction by decibel.

a. Residential Property Noise Limits.

1. No person shall produce or allow to be produced by human voice, machine, device, or any combination of same, on residential property, a noise level at any point outside of the property plane that exceeds 70 dBA between the hours of 7:00 a.m. and 9:00 p.m. or 60 dBA between the hours of 9:00 p.m. and 7:00 a.m.

- b. Commercial and Industrial Property Noise Limits. Except for commercial and industrial property abutting residential property, no person shall produce or allow to be produced by human voice, machine, device, or any other combination of same, on commercial or industrial property, a noise level at any point outside of the property plane that exceeds 70 dBA. Commercial and industrial property that abuts residential property shall be subject to the residential property noise limits set forth in subsections (a)(1) and (2).

Evaluation of Project Noise Generation

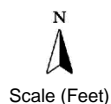
Project noise generation was quantified using a combination of provided sound level data, BAC file data, and application of accepted noise modeling techniques. The following section includes an analysis of project automatic car wash noise levels at adjacent residential and commercial properties. Adjacent properties and assessment locations (i.e., receivers) are shown in Figure 3.

Existing CMU walls and wood fences of various heights are constructed along portions of the project property boundary, as illustrated in Figure 3. Based on the results from barrier insertion loss calculation analyses, project car wash noise levels have been adjusted (where applicable) to account for screening that would be provided by the existing CMU walls. However, no adjustments were applied where existing wood fences are currently located, as the fences were identified to contain visible gaps which would significantly reduce the effectiveness as a noise barrier.

Finally, it is the understanding of BAC that the project does not propose car wash operations during the hours of 9:00 p.m. to 7:00 a.m. (i.e., nighttime hours). Based on this information, project car wash noise generation was assessed relative to the City's residential daytime / commercial (anytime) noise level limit of 70 dBA at the nearest residential and commercial properties.

**Legend**

- Parcel Boundaries
- Existing 5' CMU Wall (Noise Barrier)
- Existing 6' CMU Wall (Noise Barrier)
- Existing 16' CMU Wall (Noise Barrier)
- Existing 6' Wood Fence (Not a Noise Barrier)
- Receiver Location (8)



0 25 50

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Existing Walls, Fences & Receivers

Figure 3

Automatic Car Wash Noise Generation

There are a total of six existing self-serve car wash bays located on the project parcel. The project proposes the removal and replacement of one existing self-serve car wash bay with an automatic car wash. The locations of the existing self-serve car wash bays and proposed automatic car wash bay are shown in Figures 1 and 3.

It is the experience of BAC that noise levels generated by car washes are primarily due to the drying portion of the operation. It is the understanding of BAC that the project proposes installation of a Stealth Predator 30 HP Ultra-Quiet drying system manufactured by International Drying Corporation. The manufacturer-published sound level measurement data is provided as Appendix B. Based on the proposed site design, vehicles will enter the automatic car wash bay from the north side and exit out the south end. In this configuration, the drying assembly would be located at the south end (or exit) of the new car wash bay.

Using the equipment manufacturer sound level data provided in Appendix B, and assuming standard spherical spreading loss from a point source (-6 dB per doubling of distance), project car wash drying assembly equipment noise exposure was calculated at adjacent residential and commercial properties. The results of those calculations are presented in Table 1.

Table 1
Predicted Car Wash Drying Assembly Noise Levels at Adjacent Properties

APN and Zoning ¹	Receiver Location ²	Distance (ft) ³	Predicted Noise Level (dB) ⁴	City Noise Standard (dB) ⁵
428-0036-056-00 – Residential	1	130	43	70 – Daytime
	2	120	38	70 – Daytime
	3	110	34	70 – Daytime
	4	115	43	70 – Daytime
428-0036-067-00 – Residential	5	125	42	70 – Daytime
428-0036-065-00 – Residential	6	45	57	70 – Daytime
	7	30	65	70 – Daytime
428-0036-059-02 – Commercial	8	25	67	70 – Anytime
¹ Property locations are shown in Figures 1 and 3. ² Receiver locations are shown in Figure 3. ³ Distances scaled using provided site plan dated March 28, 2025. ⁴ Predicted noise levels based on manufacturer sound level data provided in Appendix B. ⁵ Applicable Municipal Code Section 4-1.03.1 noise level standards for residential and commercial uses.				

Source: BAC 2025

As shown in Table 1, project car wash drying assembly noise levels are predicted to satisfy the Hayward Municipal Code residential daytime / commercial (anytime) noise level limit of 70 dBA at adjacent residential and commercial property lines. Provided that the proposed car wash does not operate at nighttime (i.e., during the hours of 9:00 p.m. to 7:00 a.m.), consideration of car wash drying assembly noise mitigation measures would not be warranted for compliance with Hayward Municipal Code noise level criteria.

Conclusions

Based on the analysis and results presented in this report, noise level exposure generated by proposed automatic car wash operations is predicted to satisfy applicable Hayward Municipal Code residential daytime / commercial (anytime) noise level limits at adjacent residential and commercial property lines. Provided that the proposed car wash does not operate at nighttime (i.e., during the hours of 9:00 p.m. to 7:00 a.m.), consideration of car wash operations noise mitigation measures would not be warranted for compliance with Hayward Municipal Code noise level criteria.

These conclusions are based on the provided project site plan (dated March 28, 2025), equipment manufacturer documentation, BAC file data, and information provided by the project applicant. Deviations from the above-mentioned resources could cause actual noise levels to differ from those predicted in this assessment.

This concludes BAC's analysis of noise associated with the proposed automatic car wash bay located at 22235 Mission Boulevard in Hayward, California. Please contact BAC at (530) 537-2328 or dariog@bacnoise.com with any questions regarding this analysis.

Appendix A

Acoustical Terminology

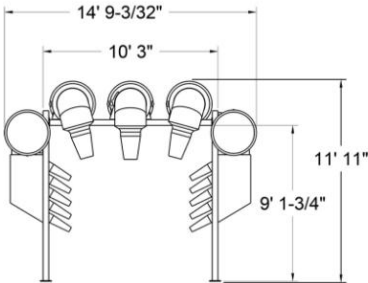
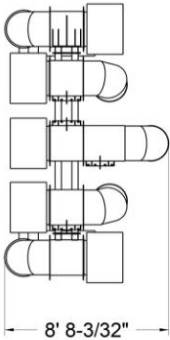
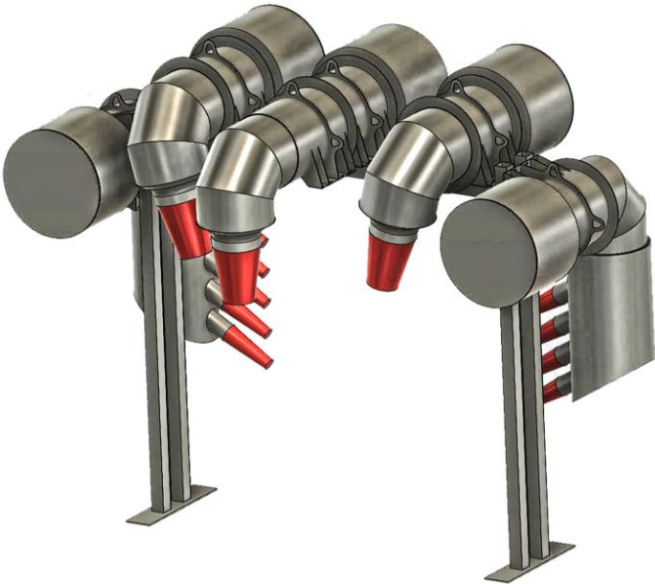
Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound. A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
IIC	Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Masking	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.
RT₆₀	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
STC	Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.



Stealth Predator Ultra-Quiet Drying System Specifications

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

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



SPECIFICATIONS

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

Closed cell foam nozzles available in red, blue, black

Ducts-Stainless Steel
Molded Aluminum Impellers
Stainless Steel Motor Housings

Slotted flanges for adjustability of air outlet and air intake direction