Environmental Noise Assessment
1299 Piedmont Road
San Jose, CA

Extant Project No. 171208.01

August 5, 2019

Prepared for:

AU Energy
41805 Albrae Street
Fremont, CA 94538

1299 Piedmont Road

Car Wash Addition

Environmental Noise Assessment

Extant Report No. 171208.01

August 5, 2019

Prepared for:

AU Energy

41805 Albrae Street
Fremont, CA 94538

Prepared by:

Michael Carr, INCE, CTS
Principal Consultant

EXTANT ACOUSTICAL CONSULTING LLC

6520 Lonetree Blvd., Suite 1016
Rocklin, CA 95765
T 916.520.4322

Executive Summary

AU Energy, with the assistance of MI Architects, Inc., is proposing the construction of a new in-bay automatic car wash on the site of an existing Shell gasoline station in in the Berryessa area of San Jose, CA. The project site is located on the northwest corner of the Piedmont Road and Sierra Road intersection; with a site address is 1299 Piedmont Road in the City of San Jose, California. The project site is bounded by commercial uses along the western and northern property lines with transportation right-of-ways bounding the proposed project site on the south and the east. The location of the project site is shown in Figure 1. The proposed site plan and configuration of the proposed project is presented in Figure 2.

The project proposes to construct a new automated car wash with ancillary uses on the existing gas station site. The hours of operation for the car wash portion of the proposed project were assumed to be 7:00 AM to 10:00 PM, consistent with guidance provided by the City of San Jose.

Extant Acoustical Consulting LLC (Extant) was retained by the project applicant to perform a noise analysis for the proposed project. In this report, Extant reviews applicable noise standards and criteria, presents the noise monitoring program, evaluates the existing noise environment, and describes modeling assumptions and methodologies used to predict noise emissions due to the proposed project. Findings of the study were evaluated and analyzed against applicable City of San Jose noise standards.

The existing noise levels and observations from the noise monitoring program were used as the basis for modeling of the existing noise environment and evaluation of the potential for project noise levels to affect the existing noise environment. Existing noise level exposures at noise-sensitive receivers in the project area were found to range from approximately 58 to 68 dBA DNL.

Noise levels from the operation of the proposed Project are anticipated to range approximately 44 to 55 dBA DNL at the noise prediction receivers; with nearby residential noise exposure levels anticipated to range from 44 to 46 dBA DNL. Based on existing noise levels experienced in the vicinity of the project site, project-generated average day-night noise levels are predicted to be at or below ambient day-night noise levels in the majority of the project study area. Moreover, project-generated noise levels are not anticipated to cause a significant increase in the existing noise environment in the project study area.

Based on the assumptions and analysis presented in this report, we conclude the following:

- Due to the elevated ambient noise environment in the general vicinity of the Project, average day-night noise levels (DNL) associated with project operations are predicted to be below ambient noise levels currently experienced in the project study area.
- The modeled noise levels generated from operation of the proposed project are predicted to comply with the City of San Jose exterior noise level standards at noise sensitive receptors in the project vicinity.
- Development of the proposed Project is anticipated to comply with the City of San Jose significant increase standards for protection of the existing noise environment, as outlined in General Plan Policy EC-1.2.
- Development and operation of the proposed Project is predicted to comply with the City of San Jose Municipal Code noise level standards.

Contents

Tables

Figures

1 Introduction

AU Energy, with the assistance of MI Architects, Inc. is proposing to construct an in-bay automated car wash at the location of an existing Shell gasoline station in the Berryessa Area of the City of San Jose, CA. The proposed project site is located on the southwest corner of the Piedmont Road and Sierra Road intersection; with an address of 1299 Piedmont Road in the City of San Jose, California. The project site is bounded by commercial land uses along the western and southern property lines, with transportation right-of-way bounding the site on the northern and eastern property lines. The location of the project site is shown in Figure 1. The proposed site plan and configuration of the proposed project is presented in .

Extant Acoustical Consulting LLC (Extant) was retained by the project applicant to perform a noise analysis for the car wash included within the proposed project. This report reviews applicable noise standards and criteria, evaluates the existing noise environment, and describes modeling assumptions and methodologies used to predict noise emissions from the car wash operations. Furthermore, the report assesses the potential for project-generated noise levels to result in noise impacts on nearby noise-sensitive receptors and land uses. Appendix A provides a description of the various noise metrics and terminology used in this report.

2 Project Description

The project being considered proposes to construct a new in-bay automated car wash on the site of an existing Shell gasoline filling station. The project would incorporate the construction of the car wash tunnel, a queuing lane and mechanical room for the car wash, signage, parking and landscaping. Additionally, the proposed project would include an air/water station, just east of the car wash, adjacent to the queuing lane and a vacuum station located adjacent to Sierra Road. Parking for the project would be located adjacent to the car wash queuing lane and at the existing food mart. The proposed site plan and configuration of the proposed project is presented in Figure 2.

The hours of operation for the gas station and convenience store are assumed to remain consistent with those of the existing gas station. The hours of operation for the proposed car wash use associated with the project are assumed to be 7:00 AM to 10:00 PM, consistent with the City of San Jose Council Policy regarding drive-through uses (CP 6-10).

Construction of the proposed project and the proximity of nearby receptors has prompted the City of San Jose to request an acoustical analysis be prepared to analyze potential noise impacts associated with the proposed car wash operations.

3 Environmental Setting

The Project site is generally located in the southeastern portion of the City of San Jose, in the Evergreen Planning Area. Land uses in the general project area include a mix of commercial, agricultural and single-family residential zoned uses. The project site is bounded by commercial uses and the transportation right-of-ways for Piedmont Road and Sierra Road.

The existing noise environment in the project area is affected by a number of noise influences, which are characteristic of urban/suburban areas. The dominant noise source in the project area is generated by vehicular traffic on the local roadway network. Commercial uses in the general project area and community activity contribute to the ambient noise level to a lesser extent. The

project area experiences occasional aircraft overflights, primarily associated with the aviation operations of San Jose International Airport and Reed Hillview Airport. Reed Hillview is located approximately 4.5 miles south of the project site and San Jose International is located approximately 5 miles west of the project site.

3.1 Existing Noise Sensitive Land Uses

Noise-sensitive land uses are generally described as those uses where exposure to excessive noise would result in adverse effects, as well as uses where quiet is an essential element of the intended purpose. Residential dwellings are of primary concern due to the potential for increased and prolonged exposure of individuals to excessive interior and exterior noise levels.

There are no noise-sensitive receptors immediately adjacent to the proposed project boundary; however, there are noise-sensitive single-family and multi-family residential receptors located throughout the general project vicinity. Noise-sensitive residential receptors nearest the proposed project site are the single-family residential located to south of Sierra Road, with additional multi-family receptors located south east of the Sierra Road and Piedmont Road intersection.

3.2 Existing Ambient Noise Survey

An ambient noise survey was conducted by Extant from December 13, 2017 through December 15, 2017 to document the existing ambient noise in the vicinity of the proposed project located at 1299 Piedmont Road. Long-term unattended ambient noise monitoring was performed at one (1) location on the project site from December 14th through December 15th. Short-term noise level monitoring was performed at two (2) locations on the project site on December 13th, 2017. Locations of the noise monitoring sites are presented on an aerial photograph of the area on Figure 1. On Figure 1, the long-term noise measurement site is represented as LT-##; short-term measurement locations are shown as ST-##.

Noise measurements were performed using Larson Davis Laboratories (LDL) Model 831 precision integrating sound level meters (SLMs). Field calibrations were performed on the SLM with an acoustic calibrator before and after the measurements. Equipment meets all pertinent specifications of ANSI S1.4-1983 (R2006) for Type 1 SLMs. All instrumentation components, including microphones, preamplifiers and field calibrators have laboratory certified calibrations traceable to the National Institute of Standards and Technology (NIST). The microphones were located at a minimum height of 5-6 ft. above the ground, an average height for a person standing, and located a sufficient distance away from reflective surfaces in the monitoring area. Noise measurements were performed in accordance with American National Standards Institute (ANSI) and American Standards for Testing and Measurement (ASTM) guidelines.

The noise monitoring equipment was configured to catalog all noise metrics pertinent to identification and evaluation of noise levels (i.e., Leq, Lmax, Ln, etc.) in the study area. Monitoring data was collected for the overall measurement period and each hourly period.

The following sections discuss the overall monitoring results for the long-term and short-term measurements.

3.2.1 Long-Term Monitoring

Long-term noise monitoring data collected during the noise monitoring program serves to establish a baseline for ambient noise levels in the project vicinity. Additionally, the noise levels cataloged illustrate the dinural pattern experienced at the site; and allow for correlation of hourly noise levels collected at the short-term monitoring locations with the 24-hour day-night noise levels. Long-term noise monitoring data is presented below for the monitoring period beginning on Thursday, December 14, 2017.

During the long-term monitoring, the primary background noise source affecting the monitoring location was vehicular traffic on the local roadway network (Piedmont Rd. and Sierra Rd.). Additional noise sources experienced during the long-term noise monitoring period included operations of the adjoining commercial uses, aircraft over-flights, emergency vehicle pass-bys and general community noise. Ambient noise level exposure at the monitoring location was dependent on the relative exposure to nearby transportation noise sources.

Noise monitoring data is summarized below Table 1 for the long-term noise monitoring location in; with detailed noise level data provided in tabular and graph form in Appendix B. The average day-night (DNL) noise level measured during the long-term ambient noise monitoring survey was approximately 62 dBA DNL at the long-term monitoring location. Maximum hourly noise levels (Lmax) documented during the long-term monitoring ranged from approximately 64 to 94 dBA Lmax, with average maximum noise levels from approximately 74 to 79 dBA Lmax.

Table 1 – Summary of Long-Term Noise Monitoring

				Average Hourly Noise Levels, dBA							
				Daytime				Nighttime			
Site	Description[1]	Date	DNL	Leq	Lmax	L50	L90	Leq	Lmax	L50	L90
LT-01	Northwest portion of Project Site	12/14/17 to 12/15/17	61.9	59.5	78.5	56.2	52.7	54.3	73.8	50.1	46.7

Notes: dBA = A-weighted decibels; DNL = 24-hour day-night noise level; Leq = equivalent average noise level; Lmax = maximum noise level; L50 = sound level exceeded 50% of the hour; L90 = sound level exceeded 90% of the hour, typically represents the background noise level.
1 – Measurement locations are provided in Figure 1 as an overlay on an aerial photograph.
Source: Extant Acoustical Consulting LLC, 2018

3.2.2 Short-Term Noise Monitoring

Short-term attended monitoring was performed by Extant staff at two (2) locations on the project site on December 13, 2017. Detailed observations about the measurement environment, existing noise sources, and other elements with the potential to affect the measurement or the project analysis were documented throughout the monitoring program. Short-term monitoring locations are depicted on Figure 1. Noise experienced at the short-term monitoring locations was predominately due to vehicular traffic on the local roadway network and noise from the existing commercial operations at the adjoining uses.

Overall noise levels measured at the short-term noise monitoring locations representing the project boundaries (ST-01 and ST-02) ranged from approximately 61 to 65 dBA Leq. Maximum noise levels documented during the monitoring survey ranged from approximately 75 to 77 dBA Lmax. Generally, noise level exposure was directly dependent on the distance of the monitoring location from surrounding traffic noise sources; however, operations at the adjacent commercial uses contributed to maximum (Lmax) noise levels. Table 2 presents the overall monitoring results for each of the short-term monitoring locations, along with some general notes from each site.

Table 2 – Summary of Short-Term Noise Monitoring

			Average Noise Levels (dBA)				
Site	Description[1]	Start Time	Leq	Lmax	L50	L90	Notes/Sources
ST-01	Western Boundary of Project Site.	11:03 AM	61.1	71.3	58.6	53.7	Traffic on Piedmont, adjacent post office operations.
		11:13 AM	59.8	70.3	58.3	53.0	
ST-02	Eastern portion of Project Site.	11:50 AM	63.0	79.8	57.6	52.9	Traffic on Piedmont and Sierra, Public transit operations.
		12:00 PM	61.2	79.5	58.4	53.8	

Notes: dB = A-weighted decibels; Leq = equivalent average noise level; Lmax = maximum noise level; L50 = sound level exceeded 50% of the period; L90 = sound level exceeded 90% of the hour, typically represents the background noise level.
1 – Measurement locations are provided in Figure 1 as an overlay on an aerial photograph.
2 – Average Day-Night Level (DNL) interpolated based on corresponding long-term measurement data.
Source: Extant Acoustical Consulting LLC, 2018

4 Regulatory Criteria

Standards and guidelines for addressing noise exposure within the City of San Jose are contained primarily in the City of San Jose General Plan, with additional guidelines found in the City of San Jose Municipal Code.

4.1 City of San Jose General Plan

The General Plan Noise Element establishes objectives, policies, and actions to protect its inhabitants against exposure of noise-sensitive uses to loud noise and to prevent encroachment of noise-sensitive uses on existing noise producing facilities.

The General Plan establishes exterior noise level standards and maximum allowable noise exposure levels at noise-sensitive land uses, which are considered "normally acceptable", and represented below in Table 3 (Section EC-1.1 and Table EC-1 of the City of San Jose General Plan). The noise level guidelines are presented in terms of the 24-hour CNEL or DNL noise level in dBA. The intent of these guidelines is to affect new project development through the discretionary review process to reduce potential noise exposure and excessive noise within the community.

As outlined in policy EC-1.2, the General Plan seeks to minimize noise impacts of new development on existing noise-sensitive receptors by limiting the effect a project may have on the existing ambient noise environment. A project is considered to cause a significant noise impact if the DNL at noise-sensitive receptors would increase by 5 dBA or more, where ambient noise levels would remain "Normally Acceptable" (60 dBA DNL); or if a project would result in an increase of 3 dBA or more, where noise levels would equal or exceed the "Normally Acceptable" level (60 dBA DNL).

Policy EC-1.3 of the General Plan limits noise generation for new non-residential land uses which are adjacent to residential land uses, to 55 dBA DNL at the residential property line.

The effects of operational noise are discussed briefly in General Plan Policy EC-1.6, which prescribes regulation of commercial and industrial operational noise levels through application of the City's Municipal Code. The Municipal Code standards are discussed in the following section.

The General Plan provides guidelines for construction operations within Policy EC-1.7, requiring construction operations within San Jose to use best available noise suppression devices and techniques; and limit construction hours near residential uses per the City's Municipal Code (7 A.M. to 7 P.M., Monday through Friday).

Policy EC-1.8 of the General Plan states that commercial drive-thru uses will only be allowed "when consistency with the City's exterior noise level guidelines and compatibility with adjacent land uses can be demonstrated."

Table 3 – Land Use Compatibility Guidelines in San Jose
(City of San Jose General Plan Noise Element, Table EC-1)

Land Use Category	Exterior Noise Exposure (DNL in Decibels (dBA)) 55 60 65 70 75 80
1. Residential, Hotels and Motels, Hospitals and Residential Care[1]	
2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	
3. Schools, Libraries, Churches, Hospitals, Nursing Homes	
4. Office Buildings – Business, Commercial & Professional	
5. Sports Area, Outdoor Spectator Sports	
6. Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters	

[1] Noise mitigation to reduce interior noise levels pursuant to Policy EC-1.1 is required.

Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise 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 San Jose General Plan (Envision 2040)

4.2 The City of San Jose Municipal Code

The City of San Jose Municipal Code addresses and provides a means for protection of the citizens of San Jose through both qualitative and quantitative provisions and prohibitions. The primary purpose of the Code is intended to promote and secure the public health, comfort, safety, welfare and prosperity, and the peace and quiet of the city and its inhabitants. The Code serves as an implementation method for the General Plan and enforcement element for establishing the desired character of the City.

As a means of enforcement, the City of San Jose Code of ordinance contains subjective (qualitative) guidelines, codes and statutes within Chapter 10.16. The City of San Jose provides further guidance and regulation on allowable noise levels within Title 20 of the Code of Ordinances, which are specific to land use. The performance standards vary from a maximum noise level of 55 dBA (e.g., residential) to 70 dBA (e.g., industrial or open space next to industrial uses), unless a conditional use permit is granted.

The City of San Jose Zoning Maps designate the parcel where the existing gasoline station is located as Commercial Neighborhood (CN). The parcels abutting the proposed project site are designated as Commercial Neighborhood and Commercial Pedestrian (CP); while other parcels in the immediate vicinity are zoned as Agricultural (A) and Residential (R-1-8).

The Municipal Code establishes in Section 20.40.600 that for Commercial Zoning Districts or Public/Quasi-Public Districts (PQP), "*the sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-105 at any property line, except upon issuance and in compliance with a conditional use permit as provided in Chapter 20.100.*" Table 20-105 establishes a maximum noise level of 55 dB for commercial or PQP uses adjacent to a property used or zoned for residential purposes (consistent with General Plan Policy EC 1.3); and, 60 dB for commercial or PQP uses adjacent to a property used or zoned for commercial or other non-residential purposes.

The Code is not explicit in terms of the acoustical descriptor associated with the noise level limits established in Table 20-135 of the Code. However, a reasonable interpretation of this standard, based on consistency with policy EC-1.3 of the City's General Plan, the noise level standard would be day-night noise level (DNL).

4.3 Council Policy 6-10

The City of San Jose provides additional guidance for the development and issuance of land uses incorporating a drive-through use. This guidance is provided within Council Policy 6-10, "Criteria for the Review of Drive-Through Uses". Section II of Council Policy 6-10 pertains specifically to noise. The Policy requires that noise levels generated by drive-through speakers are not audible from adjacent residential uses; and limits the use of drive-through speakers where drive-through lanes directly abut residential uses.

Additionally, Section III of Council Policy 6-10 limits the hours of operation for drive-through uses, stating that the drive-through use shall not operate after 10:00 PM when adjacent to properties that are zoned, planned or used as a residential.

5 Project Noise Analysis

As stated in the introduction, the project under consideration proposes to construct a new automated drive-thru in-bay car wash with a vacuum station on an existing Shell gas station. Noise sources associated with the operation of the proposed project would include people accessing the site, operations of the vacuum and the operations of the automated car wash. Because of the potential noise levels associated with the Project and the proximity to nearby land uses, the City of San Jose has requested that an environmental noise study be prepared for the Project.

5.1 Car Wash Operation Noise Levels

Automated car wash equipment and facilities have several potential noise generating sources associated with their general operation; including pumps, compressors, high-pressure applicators and spray nozzles, scrubbers, and dryers. The car wash mechanical equipment (pumps, compressors, etc.) can generate a substantial amount of noise; however, the majority of the mechanical equipment is proposed to be fully enclosed within a mechanical equipment room, inside the car wash tunnel. Potential noise sources not enclosed within the equipment room would include the high-pressure applicators and spray nozzle manifolds; noise from the friction of the scrubber, wrap and brush wash systems; and noise generated from the dryer system. The dryers however, are the dominate noise source associated with car wash systems; therefore, this analysis will examine car wash-generated noise levels through evaluation of sound levels generated by the dominant noise source, the dryer system.

The proposed full-service car wash will include the use of a Ryko 3-Fan SlimLine Dryer system with incorporated Ryko “Quiet-Kit” silencer. The Ryko 3-Fan SlimLine is a stationary, stand-alone drying system, using three (3) 10-15 horse-power blowers. The dryer system would be located approximately 10-feet inside of the southern end of the car wash tunnel. The car wash dryer manufacturer (Ryko) provided reference sound level data for the dryer in the form of sound pressure levels at varying distances. The manufacturer sound level data is provided as a reference in Appendix C. The supplied reference sound level data and operational characteristics for the equipment were used to calculate sound power levels (LwA) for the dryer.

The manufacturer reference source noise levels are based upon continuous operation of the dryers. However, drying cycles are typically limited to operate between 60 and 90 seconds per wash cycle; with the overall car wash cycles being 4 to 8 minutes in duration. Information supplied by the car wash equipment manufacturer suggests that an average of 35-40 car wash cycles can be expected per day; and that the equipment is capable of completing approximately 13 car wash cycles during a peak hour.

A comparison of trip generation rates for gas stations with and without automated car wash systems was performed. Reference manuals reviewed included the Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition (2008), the San Diego Area Governments (SANDAG) Trip Generation Manual (2003) and an article published in the ITE Journal called Service Station Trip Generation (2003). Differences in trip generation rates for gas stations with and without an additional car wash use are shown to be lower with the addition of the car wash use. The SANDAG Trip Generation Manual and the Service Station Trip Generation article both indicate that the additional car was use can be expected to have an additional rate of

5 trips per vehicle fueling position. This would result in an additional wash trip generation of 50 per day attributable to the addition of the car wash.

Applying the peak-hour rate of 13 cycles with a 90-second drying cycle, across the operational hours of the car wash using typical temporal distribution, would provide the most conservative analysis and is therefore used in this analysis.

Operational assumptions outlined above along with the calculated sound power levels were used as inputs to the SoundPLAN noise prediction model. Modeled noise levels generated from the operation of the proposed car wash at the representative noise prediction receiver locations are presented in Table 4.

As shown in Table 4, based on the manufacturer's reference noise level data and the predicted car wash trip generation rates, noise levels generated from the proposed car wash is anticipated to range from approximately 44 to 55 dBA DNL, at the prediction receivers representing the nearby property lines. Car wash dryer noise levels are calculated to range from 44 to 46 dBA DNL at noise prediction receivers representing noise-sensitive residential receptors in the project vicinity.

5.2 Vacuum Station Noise Levels

The proposed project would include the addition of one (1) J.E. Adams Vacuum station. The outdoor vacuum station is proposed for the southern portion of the property, adjacent to Sierra Road. The outdoor vacuum station would be an additional noise source proposed with the renovation of the Project site. Manufacturer supplied sound level data was provided for the vacuum unit under three motor/dome configurations. The Project does not specify which of the three configurations would be included in the design. The loudest of the three configurations is the "Regular Vac Motor (2) Plastic Dome" version, with a reference noise levels of 71 dBA at a distance of 20 feet. Manufacturer sound level data is provided as a reference in Appendix C. In addition to noise generated by the vacuum motor itself, supplemental noise sources associated to the use of the vacuum station were included in the noise simulation model. Supplemental noise sources included with each vacuum station "event" included on-site traffic accessing the vacuum station, parking operations, and ancillary activities like doors opening and closing, floor mats being brushed and beaten, patrons conversing, etc.

Empirical observations and data have shown vacuum stations to operate one (1) to three (3) cycles per hour, during normal daytime operations. As such, the vacuum station was conservatively anticipated to operate three (3) cycles per hour, between 7:00 AM and 10:00 PM (standard "daytime" time periods). Modeled noise levels generated from the operation of the vacuum station at the representative noise prediction receiver locations are presented in Table 4.

Noise levels from the operations of the proposed vacuum station are calculated to range from approximately 34 to 46 dBA DNL at the representative noise prediction receiver locations.

5.3 Overall Operational Noise Levels

On-site operational stationary-source noise levels generated in association with the proposed project would have the potential to combine and result in an additional increase in project noise levels, relative to the individual project source noise levels. As the City of San Jose noise criteria is based on the DNL metric, it is possible for the multiple project-generated operational noise levels to contribute to the integrated noise level at noise-sensitive receptors in the project vicinity.

Operational noise levels associated with the automated car wash activities and vacuum station were included in the evaluation of project-generated long-term operational noise levels within the noise simulation model as specified previously. Predicted overall noise levels generated by operation of the proposed project are summarized in Table 4 and are graphically depicted in Figure 3.

Overall operational noise levels for the proposed project as a whole (i.e., combined operational noise levels for the car wash, vacuum station, and associated on-site activities) are predicted to range from approximately 45 to 55 dBA DNL, at the representative property line noise-sensitive prediction receivers. Therefore, project noise levels are predicted to comply with the City of San Jose General Plan Envision 2040 noise level standard of 70 dBA DNL at the adjacent commercial land uses and the 55 dBA DNL non-residential noise generation standard (EC-1.3).

Table 4 – Modeled Project Site Noise Levels

		Noise Level Exposure (DNL, dBA)		
Site	Location	Car Wash	Vacuum Station	Overall Project
P-01	Post Office	55	34	55
P-02	San Jose Fire Station #19	55	46	55
P-03	Backyard of 1287 Mirabeau Court	45	35	45
P-04	Backyard of 1279 Mirabeau Court	44	34	44
P-05	Quail Hills Apartments	46	41	47

Notes: dBA = A-weighted decibels; DNL = Day-Night noise level.
Locations of noise prediction receivers and Project noise level contours (car wash, vacuum station, and associated activities) are shown on Figure 3.
Source: Extant Acoustical Consulting LLC, 2019

5.4 Effect on Existing Ambient Noise Environment

As outlined in Section 4, the City of San Jose General Plan establishes policy to limit the effect of new projects on the existing ambient noise environment. Existing ambient and traffic noise exposure levels at the site serve as the basis for evaluating if there is potential for the proposed project to result in increased noise levels. Incorporating existing traffic volumes on the local and regional roadway network into the SoundPlan noise simulation model for the overall project operations and comparing the resulting noise levels to those of the existing ambient environment, the effect of the proposed project on the existing noise environment can be determined. The analysis of the potential effects of the proposed project are presented below in Table 5.

The project-related effects on the existing ambient noise environment were calculated by finding the difference in baseline ambient noise levels (A) and combined plus project noise levels (C). The effect of the proposed project on the existing ambient environment was calculated to result in a change of less than dB from baseline no-project ambient conditions. With the project-generated car wash noise levels predicted to be 7 dB or more below the baseline ambient, project-generated noise would have a negligible effect on the ambient noise level exposure at the sensitive receptors.

Project-generated noise levels are not predicted to result in an increase of 3 dB or more in the existing noise environment, as set forth in Policy EC-1.2 of the City of San Jose General Plan. Therefore, the proposed project is predicted to comply with the City of San Jose General Plan existing ambient effect noise standards.

Table 5 – Project Effect on Existing Ambient, (dBA DNL)

Site	Location/Property Line	(A) Baseline Noise Exposure[1]	Plus Project Noise Exposure[2,3] (B) Overall Project	(C) Combined	(C-A) Effect on Ambient
P-01	Post Office	61	55	62	<1
P-02	San Jose Fire Station #19	67	55	68	–[4]
P-03	Backyard of 1287 Mirabeau Court	59	45	59	–[4]
P-04	Backyard of 1279 Mirabeau Court	58	44	58	–[4]
P-05	Quail Hills Apartments	68	47	68	–[4]

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
1 – Existing ambient noise level exposure, without implementation of the proposed project.
2 – Noise level exposure following construction and implementation of the proposed project.
3 – Project Effect determined by the difference in Baseline (A) and Plus-Project (C) noise levels.
4 – Net Project Effect resulted in a negligible change the overall noise exposure at the representative receiver.
Source: Extant Acoustical Consulting LLC, 2019

6 Conclusion

Extant Acoustical Consulting (Extant) has evaluated the proposed car wash and vacuum project; located at 1299 Piedmont Road in San Jose, California. The project is proposed to be located at the site of an existing Shell gas station, at the intersection of Piedmont Road and Sierra Road; in the Berryessa area of eastern San Jose. The project site is bounded by commercial uses along the northern and western property lines, Piedmont Road on the east and Sierra Road on the south.

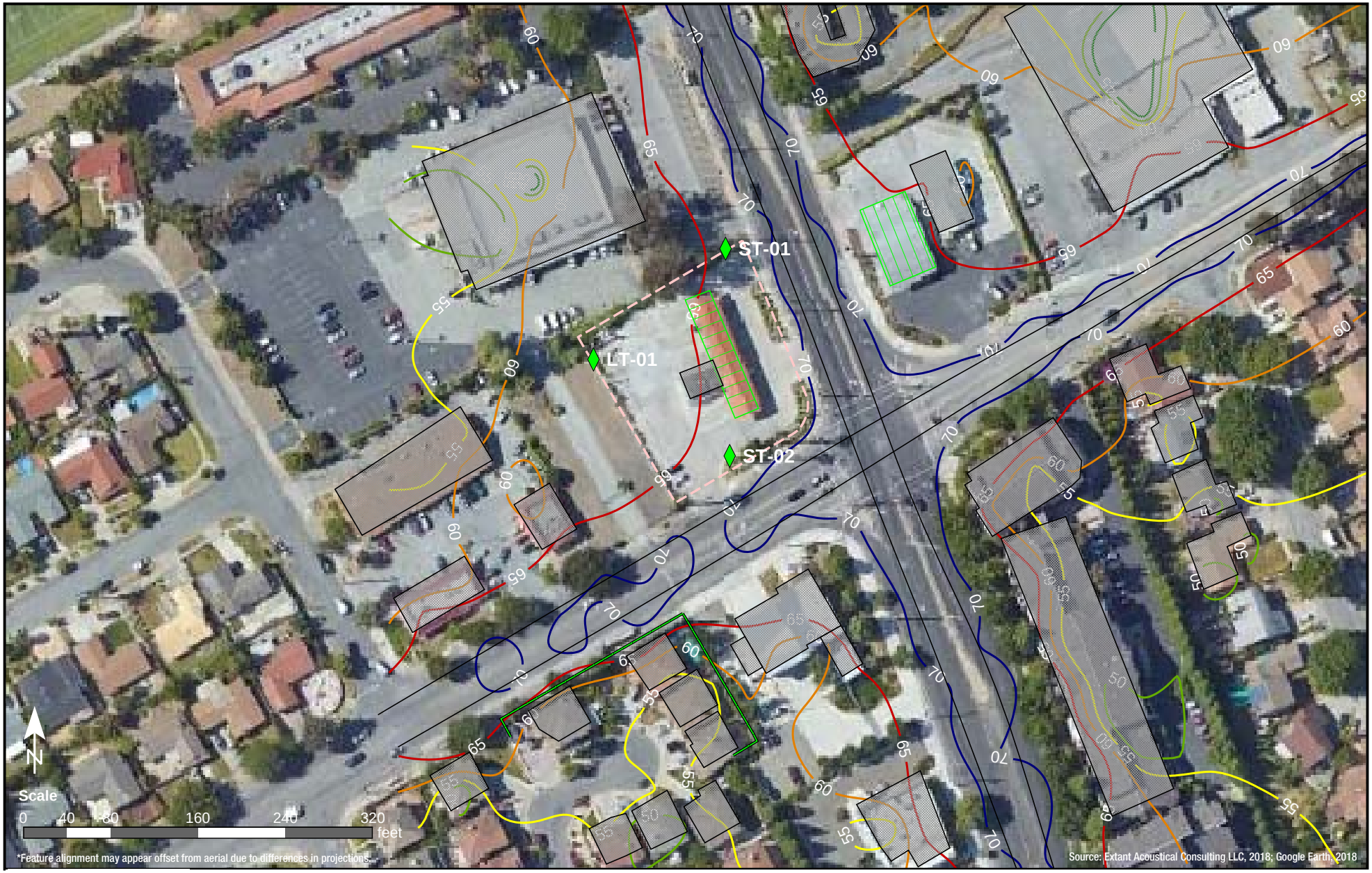
The project proposes to construct a new in-bay automated car wash on the project site. The hours of operation for the proposed car wash use associated with the project are assumed to be 7:00 AM to 10:00 PM, consistent with the City of San Jose Council Policy regarding drive-through uses (CP 6-10). The analysis summarized the existing noise environment, presented the predicted noise levels potentially associated with the by the proposed car wash, and compared the resultant noise levels with applicable City of San Jose noise standards.

Overall Project noise levels are anticipated range from approximately 44 to 55 dBA DNL, at the prediction receivers representing the nearby property lines and from 44 to 46 dBA DNL at receivers representing noise-sensitive residential receptors in the project vicinity.

Based on the analysis presented, the predicted average day-night noise levels (DNL) generated from the operation of the proposed project are predicted to comply with the City of San Jose exterior noise level standards set forth in Table EC-1 of the City of San Jose General Plan Envision 2040 (normally acceptable criteria). Project noise levels are also predicted to comply with the 55 dBA noise level standard as established in the City of San Jose General Plan Policy EC-1.3 and the City of San Jose Municipal Code.

Based on existing noise levels experienced in the vicinity of the project site, project-generated average day-night noise levels are predicted to be well below average ambient noise levels in the project study area. Noise levels generated from the proposed project were predicted to result in less than a 1 dBA increase in the existing noise environment at receivers in the project study area. Project-generated noise levels are not predicted to exceed the existing noise environment protection criteria; causing an increase of 3 dBA or more in the existing noise environment, as set forth in Policy EC-1.2 of the City of San Jose General Plan.

Development and operation of the proposed car wash at 1299 Piedmont Road is anticipated to comply with the applicable City of San Jose noise standards.



Signs and Symbols

- Project Site
- Measurement Receiver
- Building
- Existing Wall
- Fueling Canopy
- Roadway

Noise Level
Ldn, dB(A)

45 -	50
50 -	55
55 -	60
60 -	65
65 -	70
>=	70

Figure 1

Proposed Project Area
Measurement Locations
Modeled Existing Noise Level Contours, dBA Ldn

AU Energy

Shell Gas Station and Car Wash
1299 Piedmont
Santa Rosa, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 2/27/2018
Engineer: MJC

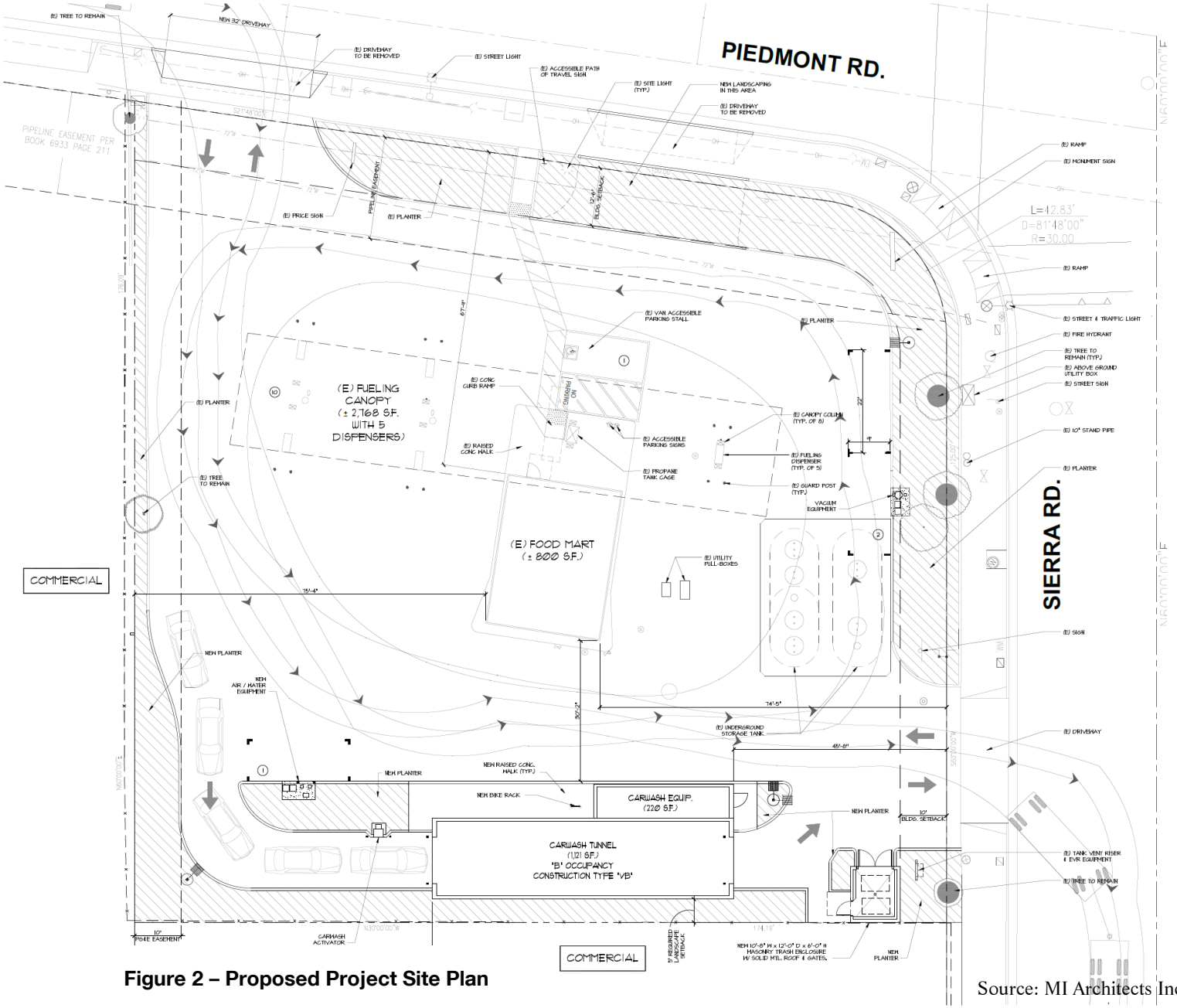
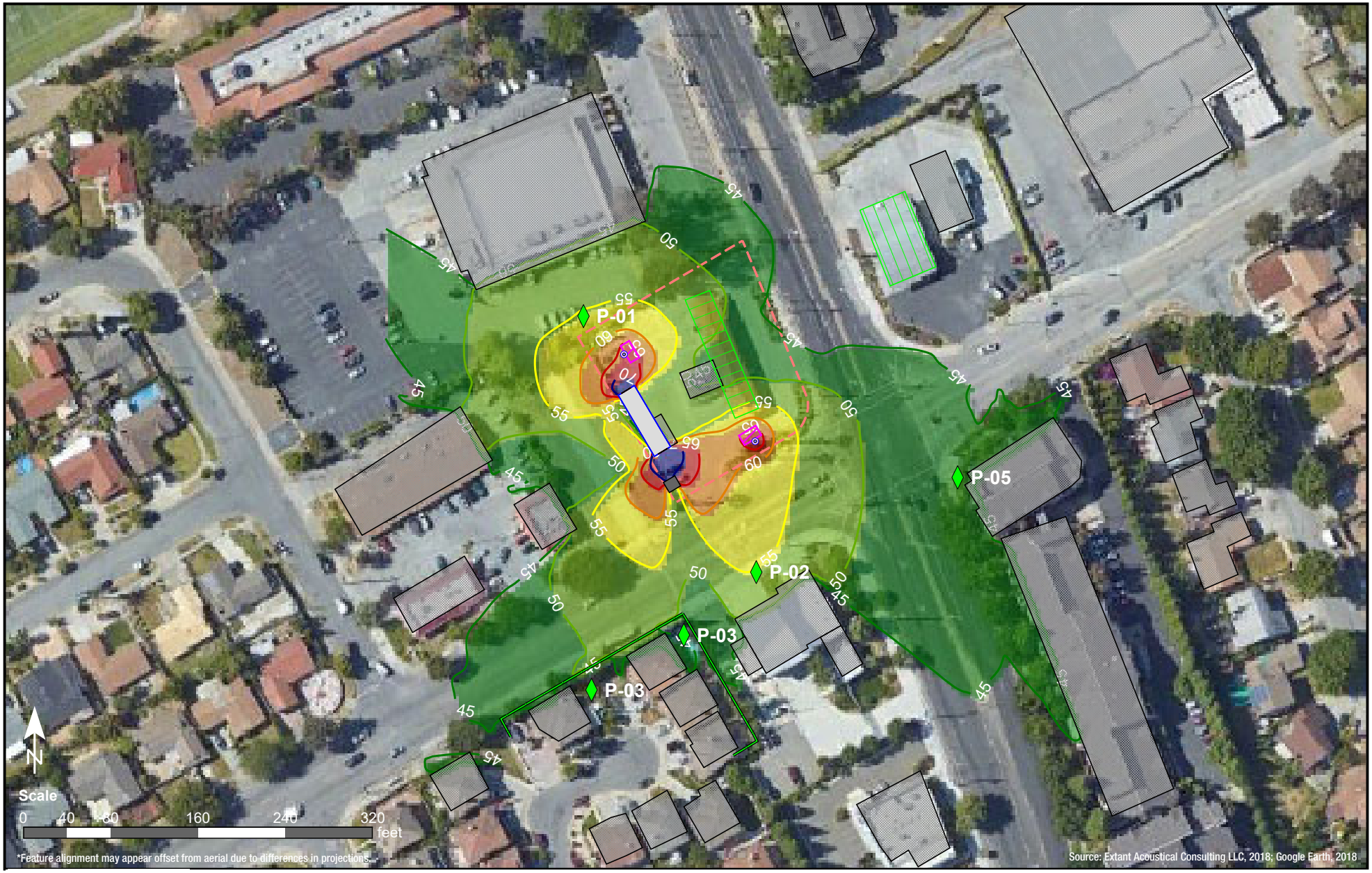


Figure 2 – Proposed Project Site Plan

Source: MI Architects Inc., 2019



Signs and Symbols

- Project Site
- Prediction Receiver
- Building
- Existing Wall
- Fueling Canopy
- Air/Water & Vacuum Station
- Car Wash Tunnel
- Trash Enclosure

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 3

Modeled Project Noise Levels

Overall Project (with vacuum) Operational Noise Level Contours, dBA Ldn
Representative Prediction Recievers

AU Energy

Shell Gas Station and Car Wash
1299 Piedmont
Santa Rosa, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 8/5/2019
Engineer: MJC

Works Cited

California Department of Transportation (Caltrans). (2013, September). Technical Noise Supplement. Sacramento, CA: California Department of Transportation. Prepared by ICF Jones & Stokes.

City of San Jose. (2011, November 1). Envision San Jose 2040, General Plan. San Jose, CA. Retrieved 2017, from sanjose.gov.

City of San Jose. (2018). *Average Daily Traffic Volumes 2005 - 2015*. Retrieved 2017, from sanjose.gov: http://data.sanjoseca.gov/dataviews/226261/average-daily-traffic-volume-2005-2015/

Federal Highway Administration. (1978, December). FHWA Highway Traffic Noise Prediction Model. *FHWA-RD-77-108*. (J. A. Reagan, & T. M. Barry, Compilers) Federal Highway Administration.

Federal Highway Administration. (2006, January). Roadway Construction Noise Model. Washington, DC.

Federal Transit Administration. (2006, May). Transit Nosie and Vibration Impact Assessment. Burlington, MA: Prepared by Harris Miller Miller & Hanson Inc. .

Ryko. (n.d.). Ryko 3-Fan SlimLine Dryer. Iowa: Ryko - National Carwash Solutions.

Ver, I. L., & Beranek, L. L. (2006). Noise and Vibration Control Engineering, Principles and Applications. In I. L. Ver, & L. L. Beranek. Hoboken, New Jersy: John Wiley & Sons.

Appendix A Description of Noise Metrics

This Appendix describes the noise terminology and metrics used in this report.

A.1 A-weighted Sound Level, dBA

Loudness is a subjective quantity that enables a listener to order the magnitude of different sounds on a scale from soft to loud. Although the perceived loudness of a sound is based somewhat on its frequency and duration, chiefly it depends upon the sound pressure level. Sound pressure level is a measure of the sound pressure at a point relative to a standard reference value; sound pressure level is always expressed in decibels (dB), a logarithmic quantity.

Another important characteristic of sound is its frequency, or "pitch." This is the rate of repetition of sound pressure oscillations as they reach our ears. Frequency is expressed in units known as Hertz (abbreviated "Hz" and equivalent to one cycle per second). Sounds heard in the environment usually consist of a range of frequencies. The distribution of sound energy as a function of frequency is termed the "frequency spectrum." The frequency spectrum of sound is often represented as the sum of the sound energy in frequency bands that are one octave or 1/3-octave wide. An octave represents a doubling of frequency.

The human ear does not respond equally to identical noise levels at different frequencies. Although the normal frequency range of hearing for most people extends from a low of about 20 Hz to a high of 10,000 Hz to 20,000 Hz, people are most sensitive to sounds in the voice range, between about 500 Hz to 2,000 Hz. Therefore, to correlate the amplitude of a sound with its level as perceived by people, the sound energy spectrum is adjusted, or "weighted."

The weighting system most commonly used to correlate with people's response to noise is "A-weighting" (or the "A-filter") and the resultant noise level is called the "A-weighted noise level" (dBA). A-weighting significantly de-emphasizes those parts of the frequency spectrum from a noise source that occurs both at lower frequencies (those below about 500 Hz) and at very high frequencies (above 10,000 Hz) where we do not hear as well. The filter has very little effect, or is nearly "flat," in the middle range of frequencies between 500 and 10,000 Hz. A-weighted sound levels have been found to correlate better than other weighting networks with human perception of "noisiness." One of the primary reasons for this is that the A-weighting network emphasizes the frequency range where human speech occurs, and noise in this range interferes with speech communication. The figure below shows common indoor and outdoor A-weighted sound levels and the environments or sources that produce them.

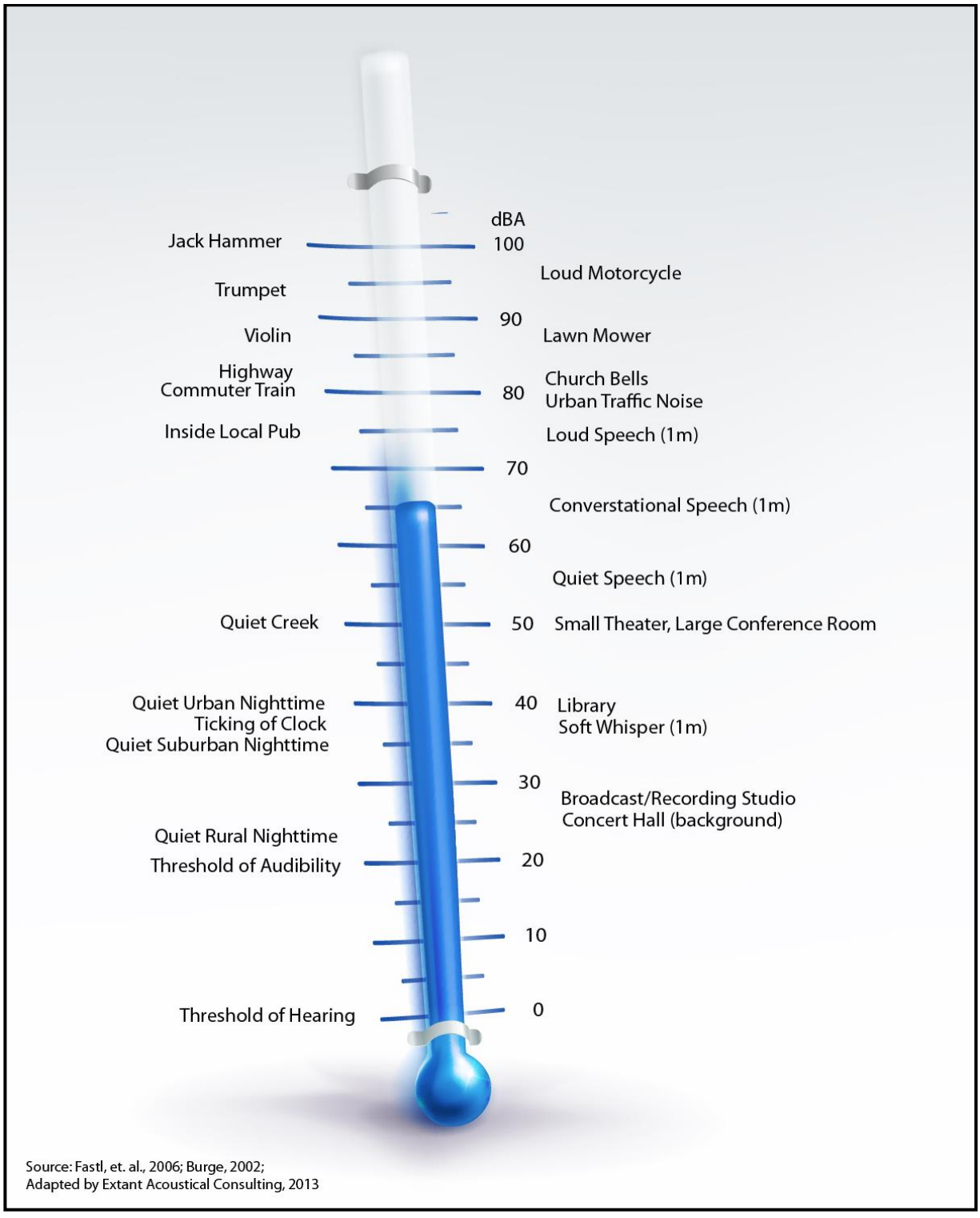


Exhibit A.1 – Common Noise Levels

A.2 Equivalent Sound Level, Leq

The Equivalent Sound Level, abbreviated L_{eq}, is a measure of the total exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest -- for example, an hour, an 8-hour school day, nighttime, or a full 24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example L_{eq1h}, or $L_{eq\ (24)}$.

L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as (is "equivalent" to) the actual time-varying sound level with its normal peaks and valleys. It is important to recognize, however, that the two signals (the constant one and the time-varying one) would sound very different from each other. Also, the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged" sound level. Thus, the loudest events may dominate the noise environment described by the metric, depending on the relative loudness of the events.

A.3 Statistical Sound Level Descriptors

Statistical descriptors of the time-varying sound level are often used instead of, or in addition to L_{eq} to provide more information about how the sound level varied during the time period of interest. The descriptor includes a subscript that indicates the percentage of time the sound level is exceeded during the period. The L_{50} is an example, which represents the sound level exceeded 50 percent of the time, and equals the median sound level. Another commonly used descriptor is the L_{10}, which represents the sound level exceeded 10 percent of the measurement period and describes the sound level during the louder portions of the period. The L_{90} is often used to describe the quieter background sound levels that occurred, since it represents the level exceeded 90 percent of the period.

A.4 DNL (Day-Night Noise Level)

The 24-hour L_{eq} with a 10 dB "penalty" applied during nighttime noise-sensitive hours, 10:00 p.m. through 7:00 a.m. The DNL attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.

A.5 CNEL (Community Noise Equivalent Level)

The CNEL is similar to the DNL described above, but with an additional 5 dB "penalty" for the noise-sensitive hours between 7:00 p.m. to 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the CNEL is typically 0.5 dB higher than the DNL.

A.6 SEL (Sound Exposure Level)

The SEL describes the cumulative exposure to sound energy over a stated period of time; typically reference to one (1) second.

Appendix B Long-Term Noise Monitoring Data

Appendix B-1
Long-Term 24 Hour Continuous Noise Monitoring

Project: 1299 Piedmont San Jose, CA
Date: Thursday December 14, 2017 to Friday December 15, 2017
Site:

Hour	Leq	Lmax	L50	L90
13:00	59.0	79.0	55.0	51.2
14:00	57.8	77.0	56.0	52.3
15:00	59.7	84.0	56.9	52.6
16:00	58.1	77.5	56.1	52.3
17:00	57.7	72.1	56.5	53.7
18:00	58.8	78.4	57.1	53.7
19:00	64.6	93.6	55.3	52.0
20:00	56.5	74.8	55.0	51.6
21:00	56.1	76.6	53.9	50.9
22:00	54.7	75.4	51.9	47.2
23:00	54.9	79.6	51.2	46.5
0:00	53.1	75.8	48.7	45.3
1:00	49.2	64.5	45.9	42.9
2:00	51.8	69.6	48.5	45.1
3:00	49.5	63.6	47.4	45.2
4:00	52.6	71.1	49.9	47.1
5:00	56.6	85.6	52.1	48.7
6:00	58.0	79.2	55.5	52.0
7:00	59.3	68.7	59.0	56.7
8:00	59.8	76.8	58.6	55.3
9:00	60.5	88.7	55.9	52.5
10:00	58.9	79.6	55.8	51.9
11:00	60.1	72.3	56.6	52.4
12:00	58.5	78.2	54.8	51.3

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	56.1	68.7	53.9	50.9
Nighttime (10 p.m. - 7 a.m.)	49.2	63.6	45.9	42.9

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	59.5	78.5	56.2	52.7
Nighttime (10 p.m. - 7 a.m.)	54.3	73.8	50.1	46.7

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	64.6	93.6	59.0	56.7
Nighttime (10 p.m. - 7 a.m.)	58.0	85.6	55.5	52.0

Energy Distribution

Daytime	85%
Nighttime	15%

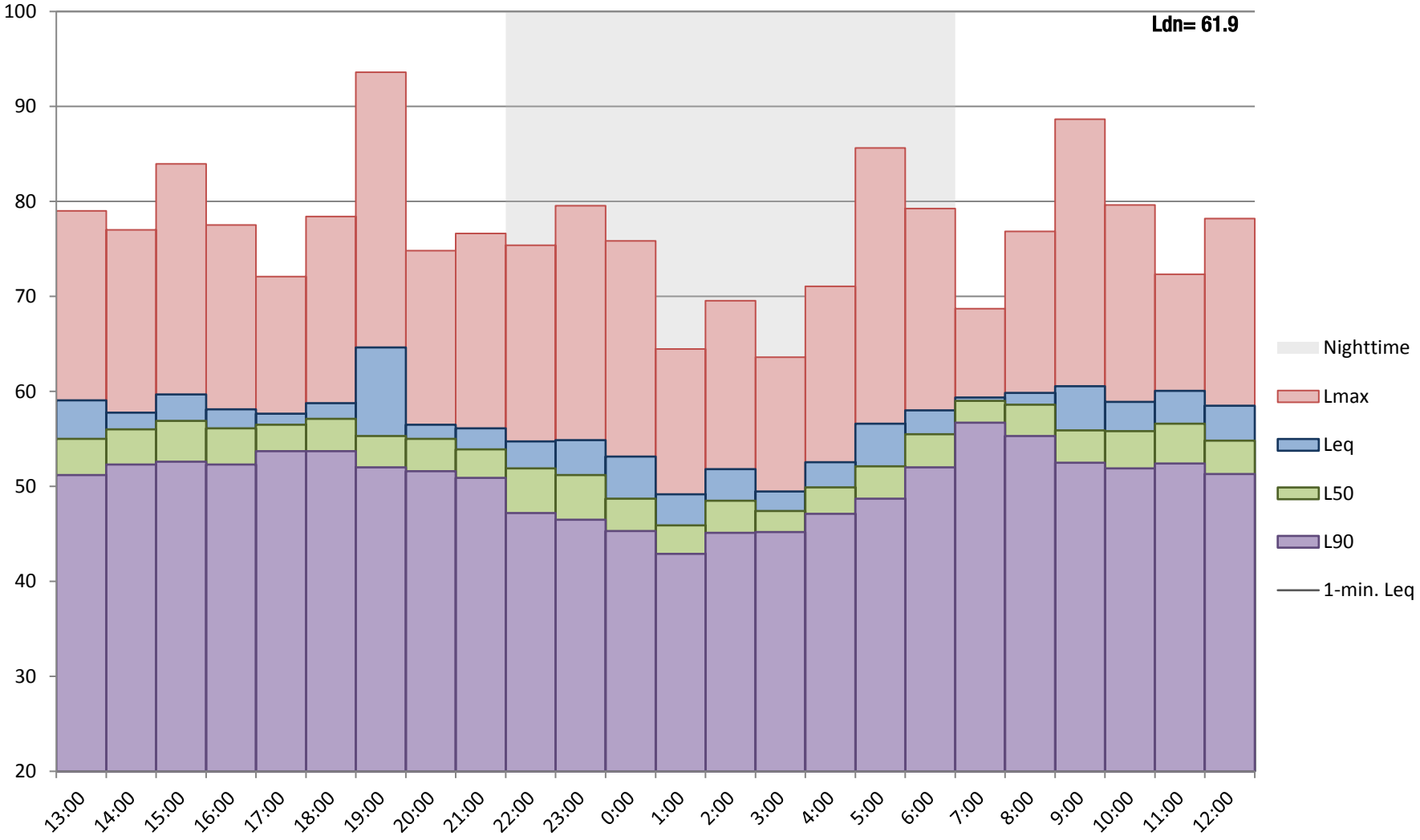
Calculated L_{dn}, dBA

61.9

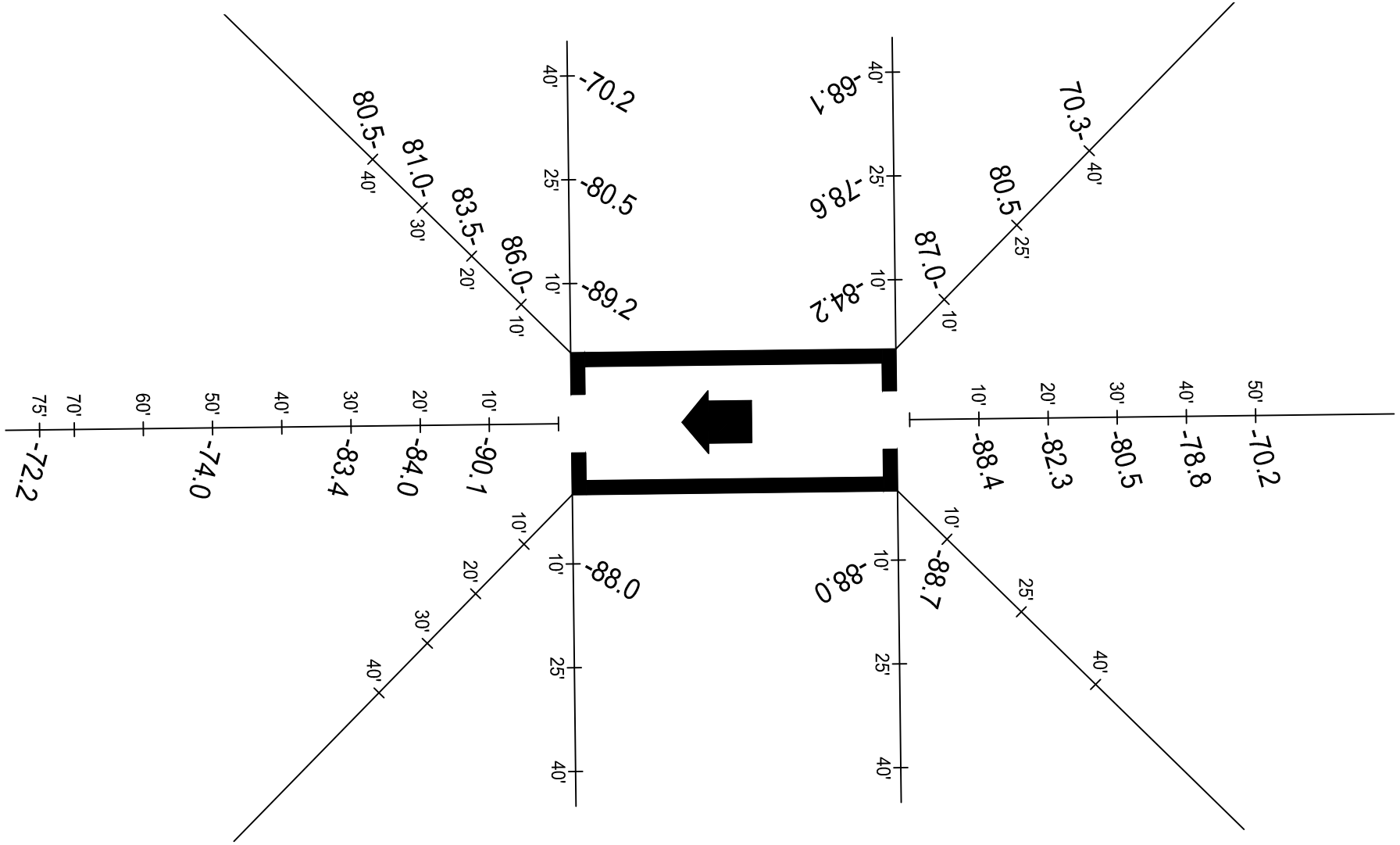
Appendix B-1

1299 Piedmont San Jose, CA -

Thursday December 14, 2017 to Friday December 15, 2017

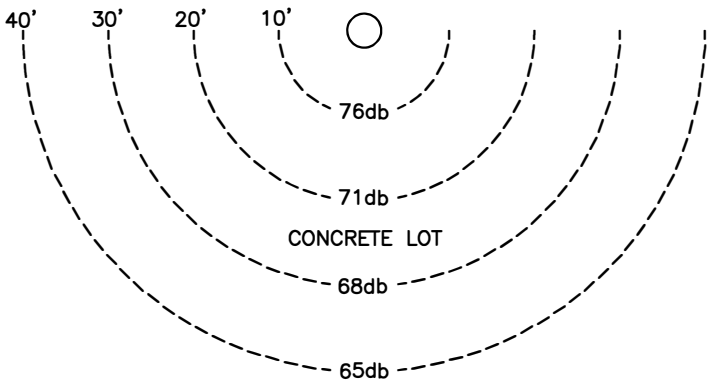


Appendix C Manufacturer Sound Level Data

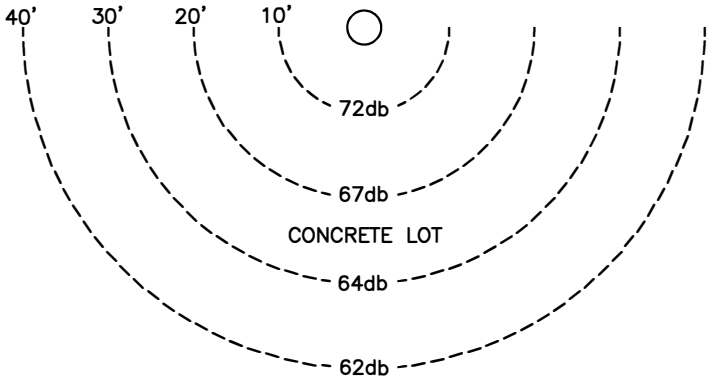


Ryko Solutions 3-Fan SlimLine Dryer

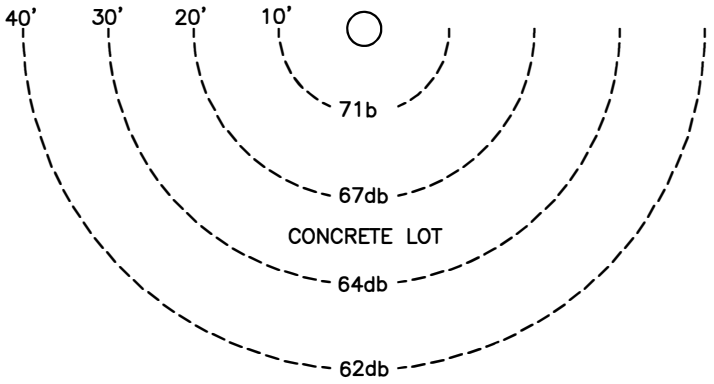
Sound Readings Taken 4/4/2016 at Toyota of Des Moines



REGULAR VAC MOTOR (2)
PLASTIC DOME



REGULAR VAC MOTOR (2)
STEEL INSULATED DOME



QUIET VAC MOTOR (2)
STEEL INSULATED DOME