



Appendix F

Noise and Vibration Analysis Technical Memorandum

TECHNICAL MEMORANDUM

To: Joseph Onyebuchi, Associate Planner, City of Burbank

From: Noemi Wyss AICP, Kimley-Horn and Associates, Inc.
Tanay Pradhan, Kimley-Horn and Associates, Inc.

Date: July 8, 2025

Subject: Burbank Soil Vapor Extraction System Upgrade Project – Noise and Vibration Analysis

1.0 Purpose

The purpose of this memorandum is to assess potential impacts due to noise and vibration associated with construction and operation of the Soil Vapor Extraction (SVE) System Upgrade Project (Project), proposed to be located in the City of Burbank (City), California.

2.0 Project Location and Description

Implementation of the Project would require development at 1234 North Victory Place and within the parking lots of the adjacent Burbank Empire Center (1501 North Victory Place, 1800 West Empire Avenue, and 1301 North Victory Place); see **Figure 1: Regional Vicinity Map**. The Project Site is generally surrounded by commercial and industrial uses bounded between the Metrolink Antelope Valley line railroad tracks and Interstate 5 (I-5); see **Figure 2: Local Vicinity Map**. The 1234 North Victory Place portion of the Project Site is currently improved with a building that contains the legacy SVE treatment system, and five parking spaces. The SVE well field is located within the parking lots of the Burbank Empire Center.

The Proposed Project would consist of four primary elements: 1) dismantling and removal of the existing legacy SVE treatment plant and associated structures; 2) installation of a new SVE treatment plant at 1234 Victory Place; 3) installation of 27 additional SVE wells beneath the Burbank Empire Center parking lots within the SVE well field; and 4) installation of an underground piping network to connect the new wells to the proposed SVE treatment system. The new SVE treatment system would be located on the northern portion of the SVE treatment plant property and would extract soil vapors containing concentrations of volatile organic compounds (VOCs) from beneath the SVE well field and treat the vapors prior to release to the atmosphere.

The 27 additional SVE wells would be installed to develop a focused SVE network for targeted VOC mass removal in source areas VMP-3 and VMP-5. The proposed wells would be drilled to a maximum depth of 145 feet and would be connected to underground conveyance piping that would convey vapors from the proposed wells to the proposed SVE treatment system. All but three of the proposed wells would be within the SVE well field; three of the proposed wells surrounding the VMP-5 source area would be in the City's right-of-way (ROW) for North Victory Place to the north.

The proposed SVE treatment plant would be accessed via the existing driveway off North Victory Place located in the adjacent parcel (APN 2462-017-032) west of the SVE treatment plant property of the Project Site. The Proposed Project would provide two parking places within the Project Site, for employees, visitors, and vendors performing periodic monitoring or other activities during operation of the SVE facility. The proposed SVE wells within the SVE well field would be accessed via the existing parking lots of the Burbank Empire Center.

Project construction is anticipated to start in early 2026 and conclude in the spring of 2027 (assumed to be up to 16 months). Project construction activities would consist of demolition of the existing legacy SVE treatment plant, Project Site grading, installation of new electrical infrastructure, and construction of the proposed SVE treatment system and associated wells and piping. Based on information provided by the applicant, construction of the proposed SVE Phase I C3 system would not overlap with construction of the proposed SVE wells and piping



SOURCE: Google Earth, 2024



FIGURE 2: Local Vicinity Map

SOIL VAPOR EXTRACTION SYSTEM UPGRADE PROJECT

3.0 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. Superimposed on this background noise is the sound from individual local sources. 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. For example, the equivalent continuous sound level (L_{eq}) is the total acoustic energy content of noise for a stated period of time; thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. 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.

4.0 Regulatory Setting

Federal Noise and Vibration Standards

There are no federal noise standards that directly regulate environmental noise related to the construction or operation of the Project. Under the Occupational Safety and Health Act of 1970 (29 United States Code [U.S.C.] Section 1919 et seq.), the Occupational Safety and Health Administration (OSHA) has adopted regulations designed to protect workers against the effects of occupational noise exposure. These regulations list permissible noise level exposure as a function of the amount of time during which the worker is exposed. The regulations further specify a hearing conservation program that involves monitoring the noise to which workers are exposed, ensuring that workers are made aware of overexposure to noise, and periodically testing the workers’ hearing to detect any degradation.

State of California Noise Standards

The State of California does not have standards for environmental noise, but the Governor’s Office of Planning and Research (OPR) has established general plan guidelines for evaluating the compatibility of various land uses as a function of community noise exposure.¹ The purpose of these guidelines is to maintain acceptable noise levels in a community setting for different land use types. Noise compatibility by different land use types is categorized into four general levels: “normally acceptable,” “conditionally acceptable,” “normally unacceptable,” and “clearly unacceptable.”

For instance, a noise environment ranging from 50 dBA CNEL to 60 dBA CNEL is considered to be “normally acceptable” for single-family residential uses, while a noise environment of 75 dBA CNEL or above for single-family residential uses is considered to be “clearly unacceptable”. In addition, California Government Code Section 65302(f) requires each county and city in the State to prepare and adopt a comprehensive long-range general plan for its physical development, with California Government Code Section 65302(f) requiring a noise element to be included in the general plan. The noise element must: (1) identify and appraise noise problems in the community; (2) recognize Office of Noise Control guidelines; and (3) analyze and quantify current and projected noise levels.

Groundborne Vibration

The California Department of Transportation’ (Caltrans’) *Transportation and Construction Vibration Manual* provides thresholds of vibration for building damage and human annoyance. Based on the Caltrans criteria, construction vibration impacts would be significant if vibration levels exceed 0.5 inches per second (in/sec) peak particle velocity (PPV) at older residential structures, which is the limit for potential building damage at these structures.² For human annoyance, construction vibration impacts would be significant if vibration levels exceed 0.25 in/sec PPV at the nearest structure.³

City of Burbank General Plan

The Burbank2035: General Plan Noise Element contains goals, policies, and best practices to protect City residents from severe noise levels, especially near noise-sensitive land uses. The following policies are applicable to the Project:

Noise Element

Goal 1: Noise Compatible Land Uses. Burbank’s diverse land use pattern is compatible with current and future noise levels.

¹ State of California Governor’s Office of Planning and Research, *General Plan Guidelines, Appendix D: Noise Element Guidelines*, 2017.

² Caltrans, *Transportation and Construction Vibration Guidance Manual*, 2020.

³ Ibid.

Policy 1.1: Ensure the noise compatibility of land uses when making land use planning decisions.

Policy 1.2: Provide spatial buffers in new development projects to separate excessive noise-generating uses from noise-sensitive uses.

Goal 3: Vehicular Traffic Noise. Burbank’s vehicular transportation network reduces noise levels affecting sensitive land uses.

Policy 3.1: Support noise-compatible land uses along existing and future roadways, highways, and freeways.

Policy 3.2: Encourage coordinated site planning and traffic management that minimize traffic noise affecting noise-sensitive land uses.

Goal 7: Construction, Maintenance, and Nuisance Noise. Construction, maintenance, and nuisance noise is reduced in residential areas and at noise-sensitive land uses.

Policy 7.1: Avoid scheduling city maintenance and construction projects during evening, nighttime, and early morning hours.

Policy 7.2: Require project applicants and contractors to minimize noise in construction activities and maintenance operations.

Policy 7.3: Limit the allowable hours of construction activities and maintenance operations located adjacent to noise-sensitive land uses.

Policy 7.4: Limit the allowable hours of operation for and deliveries to commercial, mixed-use, and industrial uses located adjacent to residential areas.

The General Plan also details land-use compatibility standards for use in evaluating planning and development decisions with regard to transportation sources (see [Table 1: Maximum Allowable Noise Exposure – Transportation Sources](#)) and stationary sources (see [Table 2: Maximum Allowable Noise Exposure – Stationary Sources](#)).

Table 1: Maximum Allowable Noise Exposure—Transportation Sources				
Land Use Category	Exterior Normally Acceptable ¹ (dBA CNEL/L _{dn})	Exterior Possibly Acceptable ² (dBA CNEL/L _{dn})	Exterior Normally Unacceptable ³ (dBA CNEL/L _{dn})	Interior Acceptable ⁴ (dBA CNEL/L _{dn} , except where noted)
Residential, single-family	≤ 60	61 – 70	≥ 71	45
Residential, multi-family	≤ 65	66 – 70	≥ 71	45
Residential, multi-family mixed-use	≤ 65	66 – 70	≥ 71	45
Transient lodging	≤ 65	66 – 70	≥ 71	45
Hospitals; nursing homes	≤ 60	61 – 70	≥ 71	45
Theaters; auditoriums; music halls	≤ 60	61 – 70	≥ 71	35 dBA L _{eq} ⁵
Churches; meeting halls	≤ 60	61 – 70	≥ 71	40 dBA L _{eq}
Playgrounds; neighborhood parks	≤ 70	71 – 75	≥ 75	-
Schools; libraries; museums	-	-	-	45 dBA L _{eq}
Offices	-	-	-	45 dBA L _{eq}
Retail/commercial	-	-	-	-
Industrial	-	-	-	-
1. Normally acceptable means that land uses may be established in areas with the stated ambient noise level, absent any unique noise circumstances 2. Possibly acceptable means that land uses should be established in areas with the stated ambient noise level only when exterior areas are omitted from the project or noise levels in exterior areas can be mitigated to the normally acceptable level. 3. Normally unacceptable means that land uses should generally not be established in areas with the stated ambient noise level. If the benefits of the project in addressing other Burbank2035 goals and policies outweigh concerns about noise, the use should be established only where exterior areas are omitted from the project or where exterior areas are located and shielded from noise sources to mitigate noise to the maximum extent feasible. 4. Interior acceptable means that the building must be constructed so that interior noise levels do not exceed the stated maximum, regardless of the exterior noise level. Stated maximums are as determined for a typical worst-case hour during periods of use. 5. dBA L_{eq} is as determined for a typical worst-case hour during periods of use.				
Source: Burbank2035: General Plan Noise Element Table N-3.				

Table 2: Maximum Allowable Noise Exposure – Stationary Noise Sources			
Noise Source	Noise Level Descriptor	Exterior Spaces – Daytime ² (7 a.m. to 10 p.m.)	Exterior Spaces – Nighttime ² (10 p.m. to 7 a.m.)
Typical	Hourly dBA L_{eq}	55 ¹	45 ¹
Tonal, impulsive, repetitive, or consisting primarily of speech or music	Hourly dBA L_{eq}	50 ¹	40 ¹
Any	dBA L_{max}	75	65
- The City may impose noise level standards that are more or less restrictive than those specified above based upon determination of existing low or high ambient noise levels. - Where the location of exterior spaces (i.e., outdoor activity areas) is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the exterior space.			
Source: Burbank2035: General Plan Noise Element Table N-4.			

The General Plan also provides the following guidelines for determining whether noise impacts are significant:

In addition to the maximum allowable noise level standards outlined in [Table 1 and Table 2], for analysis of noise impacts and determining appropriate mitigation under the California Environmental Quality Act (CEQA), an increase in ambient noise levels is assumed to be a significant noise impact if a project causes ambient noise levels to exceed the following:

- Where the existing ambient noise level is less than 60 dBA CNEL/ L_{dn} , a project-related permanent increase in ambient noise levels of 5 dBA CNEL/ L_{dn} or greater.
- Where the existing ambient noise level is greater than 60 dBA CNEL/ L_{dn} , a project-related permanent increase in ambient noise levels of 3 dBA CNEL/ L_{dn} or greater.

City of Burbank Municipal Code

The City of Burbank Municipal Code Title 9, Chapter 3 outlines noise requirements in Article 2: Noise Control. Section 9.3.208 sets the following relevant limits for machinery, equipment, fans, and air conditioning:

- Decibel Limit: No person shall operate any machinery, equipment, pump, fan, air conditioning apparatus, or similar mechanical device in such a manner as to cause the ambient noise level to be exceeded by more than five (5) decibels.
- Ambient Noise Base Level: For the purposes of this section only, all ambient noise measurements shall commence at the following ambient noise base levels in the zones and during the times shown [in Table 3: Ambient Noise Base Levels]:

Accordingly, and by way of illustration, the ambient noise level in commercial zones shall be deemed to be sixty five (65) dBA notwithstanding a lower reading; provided, however, that when the ambient noise base level for the property on which the machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device is located is higher than the ambient noise base level for adjacent property, the ambient noise base level for the adjacent property shall apply. Properties separated by a street shall be deemed to be adjacent to one another.

Table 3: Ambient Noise Base Levels		
Zone	Time	Base Levels (dBA)
Residential	Nighttime	45
	Daytime	55
Commercial	Anytime	65
All Other Zones	Anytime	70
Source: City of Burbank Municipal Code, Section 9.3.208.		

Burbank Municipal Code Title 9, Chapter 1 does not specifically set construction noise standards, but does restrict hours of construction to the following: Monday to Friday from 7 a.m. to 7 p.m., Saturday from 8 a.m. to 5 p.m., and no hours on Sunday/City Holidays.

5.0 Existing Environmental Setting

Mobile noise sources, especially cars, trucks, motorcycles, trains, and aircraft, are the City's most common and substantial noise sources. The existing mobile noise sources in the Project area are the motor vehicles traveling in the Burbank Empire Center shopping center, along North Victory Place, and along Interstate I-5, as well as trains operating on the Southern Pacific Railroad. The primary stationary noise sources in the Project vicinity are those associated with the surrounding industrial, commercial, and residential uses. Such stationary noise sources include mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] equipment and substation equipment), loading dock activities, parking lot noise, moving vehicles, music playing, and dogs barking. 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 a long-term (24-hour) measurement (LT) and three short-term (10-minute) measurements (ST) on April 30, 2024, and May 1, 2024 (see [Attachment A](#)). The noise measurement site was representative of typical existing noise exposure within and immediately adjacent to the Project Site. The measurements are summarized in [Table 4: Existing Noise Measurements](#), below. The sources of noise measured at each location are shown in [Exhibit 3: Noise Measurement Locations](#).

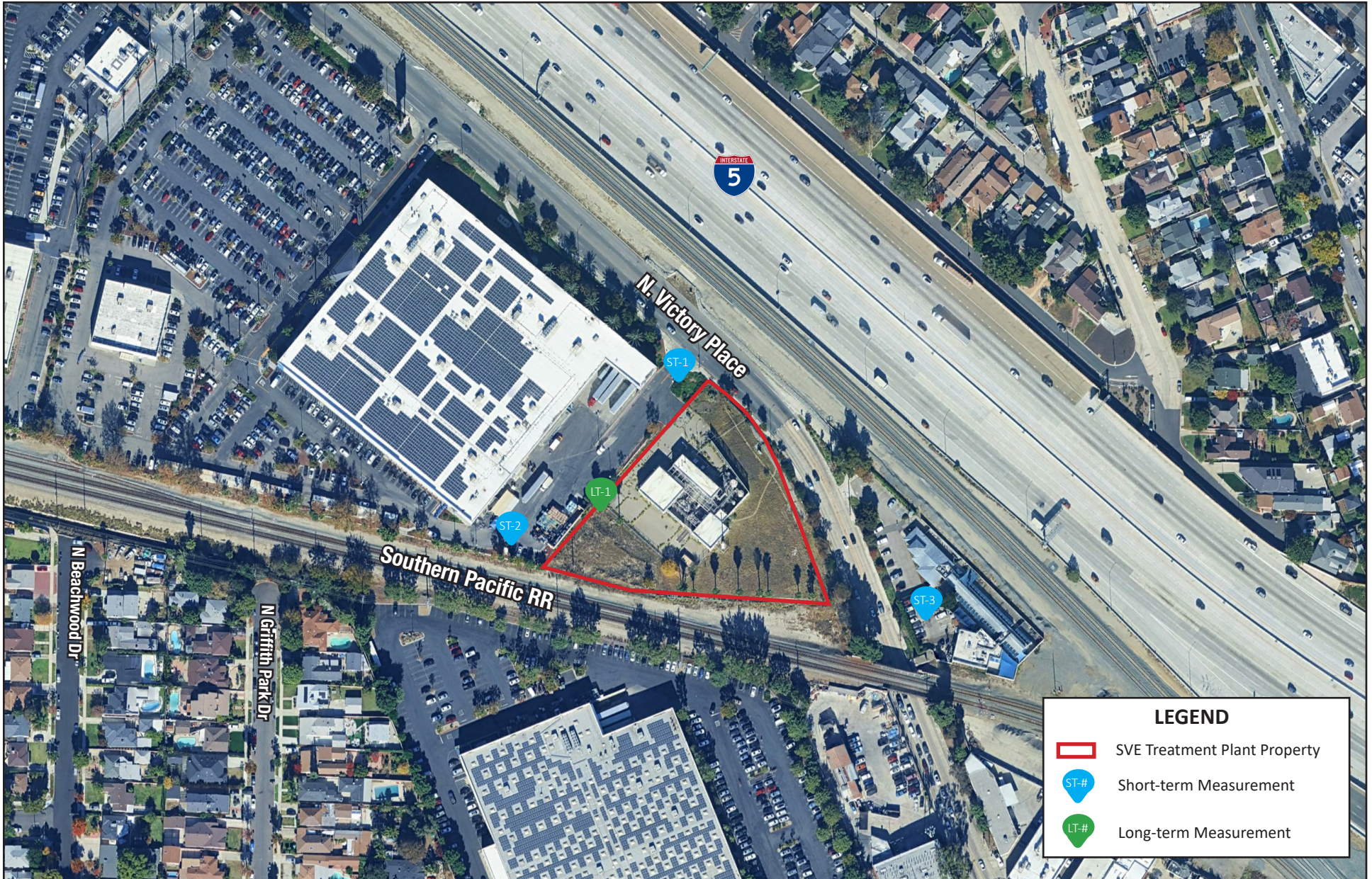
Table 4: Existing Noise Measurements					
Site	Location	L _{eq} (dBA)	L _{min} (dBA)	L _{max} (dBA)	CNEL (dBA)
ST-1	Eastern corner of Walmart, closest to the freeway	68.6	64.0	74.7	-
ST-2	Southern corner of Walmart, furthest from the freeway	64.5	58.0	77.8	-
ST-3	Animal shelter southeast of the Project site	64.0	56.8	72.4	-
LT-1	Project site	65.5	50.4	91.1	72.0
Source: Noise measurements taken by Kimley-Horn, April 30, 2024, and May 1, 2024.					

Receptor Locations

Noise exposure standards and guidelines for various types of land uses reflect varying noise sensitivities associated with uses. Land uses considered sensitive receptors include residences, hospitals, schools, childcare facilities, and places of assembly.⁴ As shown in [Table 5: Sensitive Receptor Locations](#), sensitive land uses surrounding the Project consist of mostly residential communities to the northeast and southwest of the Project Site. It should be noted that there are nearby commercial and industrial uses such as the nearby animal shelter. However, those land uses are not considered as sensitive uses and are, therefore, not included in the table below.

Table 5: Sensitive Receptor Locations	
Sensitive Receptor	Distance and Direction ¹
Single-Family Residences	440 feet northeast
Single-Family Residences	600 feet southwest
1. Distances are from edge of the Project Site to the sensitive receptor property line. Source: Nearmap 2024.	

⁴ Los Angeles County, *General Plan 2035 Chapter 11: Noise Element*, 2022.



SOURCE: Nearmaps, 2024



FIGURE 3: Noise Measurement Location Map

SOIL VAPOR EXTRACTION SYSTEM UPGRADE PROJECT

6.0 Impact Analysis

Threshold (a) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Construction Noise

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction. Noise generated by construction equipment can reach high levels. During construction, exterior noise levels could affect the noise-sensitive receptors near the construction site. Construction activities would include demolition, grading, infrastructure improvements, SVE well installation and piping, and treatment plant construction. Such activities may require excavators, loaders, and trucks during demolition; graders, tractors, and dozers during grading; excavators, cranes, and trucks during infrastructure improvements; drill rigs, excavators, and trucks during SVE well installation and piping; and excavators, tractors, loaders, compactors, forklifts, and trucks during treatment plant construction. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including dozers, excavators, loaders, forklifts, and drill rigs, can reach high levels. L_{max} is the maximum level of a noise source environment and is often used as a threshold value for typical noise levels of construction activities. Typical noise levels associated with individual construction equipment are listed in Table 6: Typical Construction Noise Levels.

Table 6: Typical Construction Noise Levels	
Equipment	Typical Noise Level (dBA L _{max}) at 50 feet from Source
Auger Drill Rig	84
Compactor	83
Crane, Mobile	81
Dozer	82
Forklift	75
Grader	85
Loader	79
Tractor	84
Truck	77
1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20\log(d_1/d_2)$ 2. Where: dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance.	
Source: Federal Highway Administration, <i>Roadway Construction Noise Model</i> , 2006.	

Daytime construction noise is not typically a concern for human health and is a common occurrence within the urban environment. Construction activity between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between 8:00 a.m. and 5:00 p.m. on Saturdays are exempt from the applicable noise standards. Although construction is not expected to occur outside of these times, a construction noise impact analysis is performed in accordance with the Federal Transit Administration (FTA) thresholds.

The Project's existing surroundings include both residential and commercial uses. Following the FTA methodology for quantitative construction noise assessments, FHWA's Roadway Construction Noise Model (RCNM) was used to predict construction noise. All construction equipment is assumed to operate at the main construction area of each phase during Project construction.⁵ During construction, equipment would be operating throughout the Project Site and not all equipment would

⁵ For the purposes of this analysis, the main construction activity areas during demolition, grading, infrastructure improvements, and treatment plant construction are defined as the anticipated SVE treatment plant construction area. The main construction activity area during SVE well installation and piping is defined as the location of VMP-5. Although some construction activities may occur at distances closer to the nearest properties, construction equipment would be dispersed throughout the Project Site during various construction activities. Therefore, main construction activity areas represent the most appropriate distance based on the sporadic nature of construction activities.

be operating at the point closest to the sensitive receptors. Refer to [Attachment A](#) for construction noise modeling results.

As mentioned previously, the City exempts construction noise from applicable noise standards when it occurs within the defined construction hours. Nonetheless, for informational purposes only, this analysis uses the FTA's criteria of 80 dBA L_{eq} for residential uses and 85 dBA L_{eq} for commercial uses to evaluate construction noise impacts at the nearest receptors.⁶

Table 7: Construction Noise Level shows the maximum noise levels for each individual construction phase, assuming simultaneous use of equipment assumed for each phase. The highest exterior noise level at the residential use located to the west of the Project Site is estimated to be 67.0 dBA L_{eq} , which would not exceed the FTA's criteria of 80 dBA L_{eq} for residential uses. At the nearest commercial use, the highest noise level would be 79.9 dBA L_{eq} , which would not exceed the FTA's criteria of 85 dBA L_{eq} for commercial uses.

Construction Phase	Receptor Location			Modeled Exterior Noise Level (dBA L_{eq}) ^{2,3}	Noise Threshold (dBA L_{eq}) ⁴	Exceeded?
	Land Use	Direction	Distance (feet) ¹			
Demolition	Residential	Northeast	440	62.7	80	No
Demolition	Commercial	West	100	75.6	85	No
Grading	Residential	Northeast	440	67.0	80	No
Grading	Commercial	West	100	79.9	85	No
Infrastructure Improvements	Residential	Northeast	440	60.3	80	No
Infrastructure Improvements	Commercial	West	100	73.2	85	No
SVE Well Installation and Piping	Residential	Northeast	800	56.7	80	No
SVE Well Installation and Piping	Commercial	South	80	76.7	85	No
Treatment Plant Construction	Residential	Northeast	440	65.3	80	No
Treatment Plant Construction	Commercial	West	100	78.2	85	No

⁶ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-3, page 179, September 2018.

Table 7: Construction Noise Levels						
Construction Phase	Receptor Location			Modeled Exterior Noise Level (dBA L _{eq}) ^{2,3}	Noise Threshold (dBA L _{eq}) ⁴	Exceeded?
	Land Use	Direction	Distance (feet) ¹			
1. Distance is from the nearest receptor to the main construction activity area of the construction phase. Not all equipment would operate at the closest distance to the receptor. 2. Modeled noise levels conservatively assume the simultaneous operation of all pieces of equipment. 3. The FTA Noise and Vibration Manual establishes construction noise standards of 80 dBA L_{eq(8-hour)} for residential uses and 85 dBA L_{eq(8-hour)} for commercial uses.						
Source: Federal Highway Administration, <i>Roadway Construction Noise Model</i> , 2006. Refer to <u>Attachment A</u> for noise modeling results.						

Although the noise generated by Project construction would be higher than ambient noise levels, construction would be temporary and cease once Project construction is completed. Construction activities would limit construction between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between 8:00 a.m. and 5:00 p.m. on Saturdays which exempts construction noise from the City's noise standards. While construction may cause short-term annoyance to adjacent uses, it would be temporary and restricted to the hours permitted by the City's noise element. In any case, the City exempts noise from construction activities from any noise level limits established. Therefore, construction noise impacts would be less than significant.

Operational Noise

Project implementation would introduce new noise sources in the Project vicinity. The Project's primary noise sources that could potentially impact nearby noise-sensitive land uses include, mechanical equipment (e.g., air blower and compressor) and loading/truck noise for waste removal.

As indicated above, the Burbank General Plan limits noise levels generated by mechanical equipment to 55 dBA L_{eq} and 75 dBA L_{max} during the daytime hours, and 45 dBA L_{eq} and 65 dBA L_{max} during the nighttime hours. Further, as shown in [Table 4](#), the ambient noise level by the Project site is above 65 dBA CNEL and therefore noise levels in the surrounding area must not increase by more than 3 dBA CNEL. Per the Burbank Municipal Code, the ambient noise level at the nearest residential zones is set to 45 dBA L_{eq} at night and 55 dBA L_{eq} during the day. The ambient noise level in commercial and industrial zones is 65 dBA L_{eq} and 70 dBA L_{eq} respectively. Noise levels generated by the Project should not cause the set ambient noise levels at these land uses to increase by more than five decibels.

Mechanical Equipment

Potential stationary noise sources related to long-term Project operations include mechanical equipment (e.g., blower and compressor). The Project's mechanical equipment was analyzed

assuming continuous operations of both pieces of equipment for 24 hours. The noise level generated by the blower and compressor is approximately 88.2 dBA L_{eq} at 1 meter and 83 dBA L_{eq} at 1 meter respectively.⁷ To model the mechanical equipment, the noise levels from both pieces of equipment were summed for a combined reference noise level of 89.3 dBA L_{eq} at 1 meter. When averaged over a 24-hour period, the reference noise level was 96 dBA CNEL at 1 meter. Refer to [Attachment A](#) for details. As indicated in [Table 8: Hourly Mechanical Equipment Noise Levels](#) and [Table 9: 24-Hour Mechanical Equipment Noise Levels](#), noise levels from the mechanical equipment would be below the ambient noise levels and would not exceed the City's General Plan and Municipal Code standards. Therefore, the Project would result in less than significant impacts concerning mechanical equipment noise levels.

Table 8: Hourly Mechanical Equipment Noise Levels						
Receptor	Project Operational Noise Level - Hourly (dBA L_{eq})	General Plan Stationary Noise Standard (dBA L_{eq}) ²	Exceed Standard?	Municipal Code Ambient Noise Base Level (dBA L_{eq}) ³	Increase over Ambient	Exceed Threshold?
Single Family Residences (Northeast)	37.6 ¹	55/45	No	45 ⁴	0.7	No
Commercial (Northwest)	61.6	-	-	65	1.6	No
Industrial (East)	48.8	-	-	70	0.0	No
1. A ten decibel reduction is taken due to noise attenuation from a retaining wall, intervening highway, and highway sound wall between the Project site and the nearest residences. 2. Per Table 2, the General Plan limits stationary noise levels at the nearest sensitive land uses to 55 dBA L_{eq} during the day and 45 dBA L_{eq} at night. 3. Per BMC Section 9.3.208, the generated noise levels must not exceed the median ambient noise level at the receptors or the measured ambient noise level, whichever is greater. 4. Per Table 3, the residential ambient noise base level is 45 dBA L_{eq} during the nighttime and 55 dBA L_{eq} during the daytime. Equipment noise levels are compared to the 45 dBA nighttime standard as compliance with the stricter nighttime noise standard would mean the noise generated would comply with the daytime noise standard.						

⁷ Noise levels found in equipment specification sheets provided by Lockheed Martin.

Table 9: 24-Hour Mechanical Equipment Noise Levels					
Receptor	Project Operational Noise Level – 24-Hour (dBA CNEL)	Ambient Noise Level (dBA CNEL)	Ambient Plus Project Noise Level (dBA CNEL)	Increase over Ambient ²	Exceed Threshold?
Single Family Residences (West)	44.3 ¹	72	72.0	0.0	No
Commercial (Northeast)	68.3	72	73.5	1.5	No
Industrial (Northwest)	55.5	72	72.1	0.1	No
1. A ten decibel reduction is taken due to noise attenuation from a retaining wall, intervening highway, and highway sound wall between the Project site and the nearest residences. 2. The General Plan limits the increase in existing ambient noise to 5 dBA CNEL when ambient noise levels are below 60 dBA CNEL and 3 dBA CNEL when ambient noise levels are above 60 dBA CNEL.					

Mobile Traffic Noise

The proposed SVE treatment system would be designed to operate autonomously 24 hours per day, 7 days per week, without an operator on-site. Proposed Project operations would not have continuous staffing or work shifts. Operation and maintenance visits would be made at least one day per week to collect operational data such as flow rates, temperatures, and pressures, and to monitor the influent and effluent VOC concentrations at the proposed SVE treatment plant. Further, other special treatment plant operations, such as restarting the system after shutdown or unscheduled maintenance, would necessitate an operator trip to the Project site. Since the Project would generate a minimal number of vehicle trips, mobile noise generated by the Project would not cause traffic noise to increase in the surrounding area. Thus, impacts related to mobile noise would be less than significant.

Threshold (b) Generate excessive groundborne vibration or groundborne noise levels.

Construction Vibration

Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Project construction could result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Construction activities could occur as close as 80 feet from the nearest structure. Table 10: Typical Construction Equipment Vibration Levels identifies vibration velocity levels at 25 feet and 80 feet for various types of equipment likely to operate at the Project Site during construction.

Table 10: Typical Construction Equipment Vibration Levels		
Equipment	Peak Particle Velocity at 25 feet (in/sec)	Peak Particle Velocity at 80 feet (in/sec)
Vibratory compactor/roller	0.210	0.037
Large Bulldozer	0.089	0.016
Loaded Trucks	0.076	0.013
Small Bulldozer	0.003	0.001
Source: Federal Transit Administration, <i>Transit Noise and Vibration Impact Assessment Manual</i> , 2018.		

The City has not adopted specific standards for vibration impacts during construction. Therefore, the Caltrans *Transportation and Construction Vibration Guidance Manual* (2020) is used to evaluate construction vibration impacts related to potential building damage. Based on the Caltrans criteria, construction vibration impacts would be significant if vibration levels exceed 0.25 in/sec PPV at the nearby structures, which is the distinctly perceptible threshold for humans and is below the limit for potential building damage at older structures. As shown in [Table 10](#), the vibration velocities at 80 feet from construction equipment could be up to 0.037 in/sec PPV at the nearest structure. Therefore, construction vibration would not exceed the 0.25 in/sec PPV threshold of perception and would be below the structural damage threshold for older structures. Thus, vibration impacts during Project construction would be less than significant.

Operational Vibration

The Project would not generate groundborne vibration during operations that could be felt at surrounding uses. Project operations would not involve railroads or substantial heavy truck operations and, therefore, would not result in vibration impacts at surrounding uses. As a result, impacts from vibration associated with Project operation would be less than significant.

Threshold (c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels?

The nearest airport to the Project Site is the Hollywood Burbank Airport located approximately 1.3 miles northwest of the Project site. The Project is not located within the current noise contours for the airport and would not be impacted by airport noise.⁸ Additionally, there are no private airstrips located within the Project vicinity. Therefore, the Project would not expose people residing or

⁸ Hollywood Burbank Airport, *Current Noise Contour*, August 2021. Available at <https://www.hollywoodburbankairport.com/wp-content/uploads/2022/05/Current-Noise-Contour.pdf>

working in the Project area to excessive airport- or airstrip-related noise levels and no mitigation is required.

7.0 Conclusion

The Project's construction and operational noise and vibration levels would not exceed applicable standards. The Project construction and operational noise and vibration impacts would be less than significant, and no mitigation is required.

8.0 References

1. California Department of Transportation, *Transportation and Construction Vibration Manual*, 2020.
2. City of Burbank, *Burbank2035: General Plan Noise Element*, 2013.
3. City of Burbank, *Municipal Code*, 2024.
4. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
5. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
6. Hollywood Burbank Airport, *Current Noise Contour*, 2021.
7. Los Angeles County, *General Plan 2035 Chapter 11: Noise Element*, 2022.
8. State of California Governor's Office of Planning and Research, *General Plan Guidelines, Appendix D: Noise Element Guidelines*, 2017.

Attachment A

Noise Data

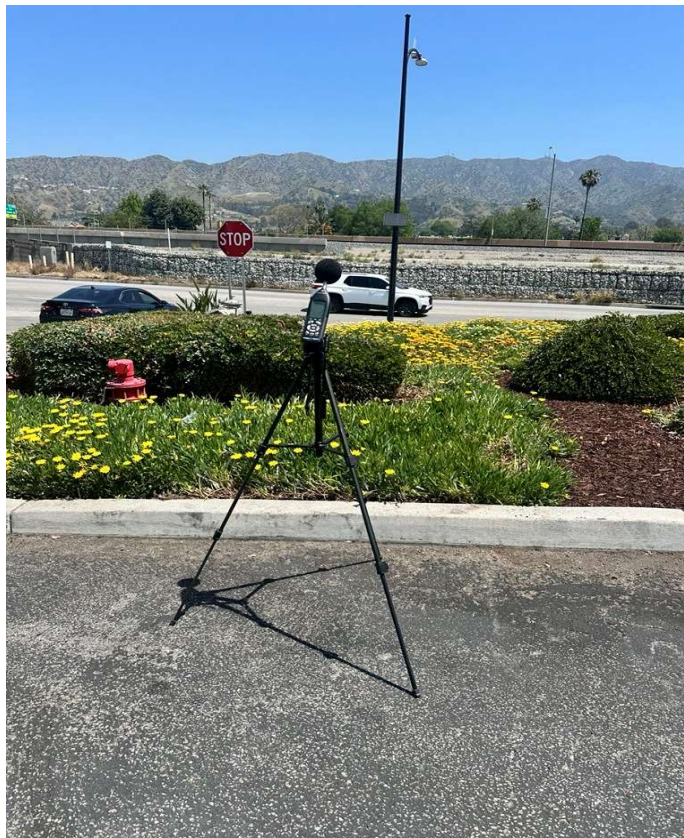
Noise Measurement Field Data

Project:	Burbank Lockheed	Job Number:		
Site No.:	ST-1	Date:	4/30/2024	
Analyst:	Kennedy & Sophia	Time:	11:53 a.m.	
Location:	Corner of Walmart, closest to the freeway			
Noise Sources:	Traffic, music from cars, and Metrolink			
Comments:	None			
Results (dBA):				
	Leq:	Lmin:	Lmax:	Peak:
	68.8	64.7	74.7	87.8

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

Weather	
Temp. (degrees F):	73
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.84
Humidity:	50%

Photo:



Measurement Report

Report Summary

Meter's File Name	ST_.027.s	Computer's File Name	LxTse_0005586-20240430 115315-ST_.ldbin		
Meter	LxT SE 0005586	Firmware	2.404		
User		Location			
Job Description					
Note					
Start Time	2024-04-30 11:53:15	Duration	0:10:00.0		
End Time	2024-04-30 12:03:15	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-04-08 13:59:10	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	68.8 dB		
LAE	96.6 dB	SEA	--- dB
EA	505.7 µPa²h		
LA _{peak}	87.8 dB	2024-04-30 11:59:43	
LAS _{max}	74.7 dB	2024-04-30 11:59:44	
LAS _{min}	64.7 dB	2024-04-30 11:55:05	
LA _{eq}	68.8 dB		
LC _{eq}	77.7 dB	LC _{eq} - LA _{eq}	8.9 dB
LA _{eq}	69.6 dB	LA _{eq} - LA _{eq}	0.8 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	L _{DN}	L _{Day}	L _{Night}	
	68.8 dB	68.8 dB	0.0 dB	
	L _{DEN}	L _{Day}	L _{Eve}	L _{Night}
	68.8 dB	68.8 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	68.8 dB		77.7 dB		--- dB	
L _{ξ(max)}	74.7 dB	2024-04-30 11:59:44	--- dB	None	--- dB	None
L _{ξ(min)}	64.7 dB	2024-04-30 11:55:05	--- dB	None	--- dB	None
L _{Peak(max)}	87.8 dB	2024-04-30 11:59:43	--- 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	70.9 dB
LAS 10.0	70.4 dB
LAS 33.3	69.2 dB
LAS 50.0	68.5 dB
LAS 66.6	67.8 dB
LAS 90.0	66.6 dB

Noise Measurement Field Data

Project:	Burbank Lockheed	Job Number:		
Site No.:	ST-2	Date:	4/30/2024	
Analyst:	Kennedy & Sophia	Time:	12:05 p.m.	
Location:	Corner of Walmart, furthest from the freeway			
Noise Sources:	Traffic, Walmart loading dock			
Comments:	None			
Results (dBA):				
	Leq:	Lmin:	Lmax:	Peak:
	64.5	58.0	77.8	99.1

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):	< 5
Sky:	Clear
Bar. Pressure:	29.83
Humidity:	49%

Photo:



Measurement Report

Report Summary

Meter's File Name	ST_.028.s	Computer's File Name	LxTse_0005586-20240430 120555-ST_.ldbin		
Meter	LxT SE 0005586	Firmware	2.404		
User		Location			
Job Description					
Note					
Start Time	2024-04-30 12:05:55	Duration	0:10:00.0		
End Time	2024-04-30 12:15:55	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-04-08 13:59:10	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	64.5 dB		
LAE	92.3 dB	SEA	--- dB
EA	187.9 µPa²h		
LA _{peak}	99.1 dB	2024-04-30 12:08:45	
LAS _{max}	77.8 dB	2024-04-30 12:08:46	
LAS _{min}	58.0 dB	2024-04-30 12:15:15	
LA _{eq}	64.5 dB		
LC _{eq}	73.8 dB	LC _{eq} - LA _{eq}	9.3 dB
LA _{eq}	68.5 dB	LA _{eq} - LA _{eq}	4.0 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

L _{DN}	L _{Day}	L _{Night}	
64.5 dB	64.5 dB	0.0 dB	
L _{DEN}	L _{Day}	L _{Eve}	L _{Night}
64.5 dB	64.5 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	64.5 dB		73.8 dB		--- dB	
L _{ξ(max)}	77.8 dB	2024-04-30 12:08:46	--- dB	None	--- dB	None
L _{ξ(min)}	58.0 dB	2024-04-30 12:15:15	--- dB	None	--- dB	None
L _{Peak(max)}	99.1 dB	2024-04-30 12:08:45	--- 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	68.2 dB
LAS 10.0	66.9 dB
LAS 33.3	64.4 dB
LAS 50.0	63.4 dB
LAS 66.6	62.1 dB
LAS 90.0	60.3 dB

Noise Measurement Field Data

Project:	Burbank Lockheed	Job Number:		
Site No.:	ST-3	Date:	4/30/2024	
Analyst:	Kennedy & Sophia	Time:	12:26 p.m.	
Location:	Animal Shelter			
Noise Sources:	Traffic, car music, dogs barking, keys jangling			
Comments:	None			
Results (dBA):				
	Leq:	Lmin:	Lmax:	Peak:
	64.0	56.8	72.4	92.4

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):	< 5
Sky:	Clear
Bar. Pressure:	29.83
Humidity:	48%

Photo:



Measurement Report

Report Summary

Meter's File Name	ST_.029.s	Computer's File Name	LxTse_0005586-20240430 122617-ST_.029.ldbin		
Meter	LxT SE 0005586	Firmware	2.404		
User		Location			
Job Description					
Note					
Start Time	2024-04-30 12:26:17	Duration	0:10:00.0		
End Time	2024-04-30 12:36:17	Run Time	0:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-04-08 13:59:10	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	64.0 dB		
LAE	91.8 dB	SEA	--- dB
EA	167.5 µPa²h		
LA _{peak}	92.4 dB	2024-04-30 12:34:20	
LAS _{max}	72.4 dB	2024-04-30 12:35:44	
LAS _{min}	56.8 dB	2024-04-30 12:32:53	
LA _{eq}	64.0 dB		
LC _{eq}	76.3 dB	LC _{eq} - LA _{eq}	12.3 dB
LA _{eq}	65.2 dB	LA _{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

L _{DN}	L _{Day}	L _{Night}	
64.0 dB	64.0 dB	0.0 dB	
L _{DEN}	L _{Day}	L _{Eve}	L _{Night}
64.0 dB	64.0 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	64.0 dB		76.3 dB		--- dB	
L _{ξ(max)}	72.4 dB	2024-04-30 12:35:44	--- dB	None	--- dB	None
L _{ξ(min)}	56.8 dB	2024-04-30 12:32:53	--- dB	None	--- dB	None
L _{Peak(max)}	92.4 dB	2024-04-30 12:34:20	--- 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	66.7 dB
LAS 10.0	65.7 dB
LAS 33.3	64.1 dB
LAS 50.0	63.4 dB
LAS 66.6	62.8 dB
LAS 90.0	61.7 dB

Noise Measurement Field Data

Project:	Burbank Lockheed	Job Number:	
Site No.:	LT-1	Date:	4/30/2024-5/1/2024
Analyst:	Kennedy & Sophia	Time:	1:02 p.m.
Location:	Project Site		
Noise Sources:	NA		
Comments:	None		

Results (dBA):				
	Leq:	Lmin:	Lmax:	Peak:
	65.5	50.4	91.1	108.9

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):	< 5
Sky:	Clear
Bar. Pressure:	29.83
Humidity:	48%

Photo:



Measurement Report

Report Summary

Meter's File Name	ST_.030.s	Computer's File Name	LxTse_0005586-20240430 130251-ST_.030.ldbin		
Meter	LxT SE 0005586	Firmware	2.404		
User		Location			
Job Description					
Note					
Start Time	2024-04-30 13:02:51	Duration	24:10:00.0		
End Time	2024-05-01 13:12:51	Run Time	24:10:00.0	Pause Time	0:00:00.0
Pre-Calibration	2024-04-08 13:59:10	Post-Calibration	None	Calibration Deviation	---

Results

Overall Metrics

LA _{eq}	65.5 dB		
LAE	114.9 dB	SEA	--- dB
EA	34.3 mPa²h		
LA _{peak}	108.9 dB		2024-04-30 13:03:19
LAS _{max}	91.1 dB		2024-05-01 02:09:03
LAS _{min}	50.4 dB		2024-05-01 03:35:53
LA _{eq}	65.5 dB		
LC _{eq}	76.0 dB	LC _{eq} - LA _{eq}	10.5 dB
LA _{eq}	66.5 dB	LA _{eq} - LA _{eq}	1.0 dB

Exceedances

	Count	Duration
--	-------	----------

LAS > 85.0 dB	1	0:00:08.7
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

L _{DN}	L _{Day}	L _{Night}	
71.6 dB	65.8 dB	0.0 dB	
L _{DEN}	L _{Day}	L _{Eve}	L _{Night}
72.0 dB	65.3 dB	67.5 dB	65.1 dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L _{eq}	65.5 dB		76.0 dB		--- dB	
L _{ξ(max)}	91.1 dB	2024-05-01 02:09:03	--- dB	None	--- dB	None
L _{ξ(min)}	50.4 dB	2024-05-01 03:35:53	--- dB	None	--- dB	None
L _{Peak(max)}	108.9 dB	2024-04-30 13:03:19	--- 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	68.9 dB
LAS 10.0	68.1 dB
LAS 33.3	66.0 dB
LAS 50.0	64.4 dB
LAS 66.6	62.6 dB
LAS 90.0	59.8 dB

Time History



Project: **Burbank Lockheed**
Construction Noise Impact on Sensitive Receptors

Parameters		
Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Average Distance (feet)	Distance to Property Line (feet)	Shielding	Direction
1	Residence	440	-	0	N
2	Commercial	100	-	0	S
3	Animal Shelter	350	-	0	E

Construction Noise Levels by Phase (Leq)					
			SVE	Treatment Plant	
Demolition	Site Grading	Infrastructure	Construction	Construction	
62.7	67.0	60.3	56.7	65.3	
75.6	79.9	73.2	76.7	78.2	
64.7	69.0	62.3	46.5	67.3	

Construction Phase	Equipment Type	No. of Equip.	Acoustical Usage Factor	Reference Noise Level at 50ft per Unit, Lmax
Demolition	Excavator	2	40%	81
	Front End Loader	1	40%	79
	Dump Truck	1	40%	77
	Combined LEQ			
Site Grading	Grader	1	40%	85
	Tractor	2	40%	84
	Dozer	1	40%	82
	Combined LEQ			
Infrastructure	Excavator	1	40%	81
	Crane	1	16%	81
	Dump Truck	1	40%	77
	Combined LEQ			
SVE Construction	Auger Drill Rig	1	20%	84
	Excavator	1	40%	81
	Dump Truck	1	40%	77
	Combined LEQ			
Treatment Plant Construction	Excavator	1	40%	81
	Tractor	1	40%	84
	Front End Loader	1	40%	79
	Compactor (ground)	1	20%	83
	Backhoe	1	40%	78
	Dump Truck	1	40%	77
	Combined LEQ			

Source for Ref. Noise Levels: RCNM, 2005

RECEPTOR 1			RECEPTOR 2			RECEPTOR 3		
Distance (feet)	Noise Level at Receptor 1, Lmax	Noise Level at Receptor 1, Leq	Distance (feet)	Noise Level at Receptor 2, Lmax	Noise Level at Receptor 2, Leq	Distance (feet)	Noise Level at Receptor 3, Lmax	Noise Level at Receptor 3, Leq
440	64.8	60.8	100.0	77.7	73.7	350.0	66.8	62.8
440	60.2	56.2	100.0	73.1	69.1	350.0	62.2	58.2
440	57.6	53.6	100.0	70.5	66.5	350.0	59.6	55.6
		62.7			75.6			64.7
440	66.1	62.1	100.0	79.0	75.0	350.0	68.1	64.1
440	68.1	64.1	100.0	81.0	77.0	350.0	70.1	66.1
440	62.8	58.8	100.0	75.7	71.7	350.0	64.8	60.8
		67.0			79.9			69.0
440	61.8	57.8	100.0	74.7	70.7	350.0	63.8	59.8
440	61.7	53.8	100.0	74.6	66.6	350.0	63.7	55.7
440	57.6	53.6	100.0	70.5	66.5	350.0	59.6	55.6
		60.3			73.2			62.3
800	60.3	53.3	80.0	80.3	73.3	2600.0	50.1	43.1
800	56.6	52.6	80.0	76.6	72.6	2600.0	46.4	42.4
800	52.4	48.4	80.0	72.4	68.4	2600.0	42.2	38.2
		56.7			76.7			46.5
440	61.8	57.8	100.0	74.7	70.7	350.0	63.8	59.8
440	65.1	61.1	100.0	78.0	74.0	350.0	67.1	63.1
440	60.2	56.2	100.0	73.1	69.1	350.0	62.2	58.2
440	64.3	57.3	100.0	77.2	70.2	350.0	66.3	59.3
440	58.7	54.7	100.0	71.6	67.6	350.0	60.7	56.7
440	57.6	53.6	100.0	70.5	66.5	350.0	59.6	55.6
		65.3			78.2			67.3