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ATTACHMENT DR NOISE-1

Revised Noise and Vibration Analysis

Goodman Energy Park Vernon
Data Center and Backup Generating Facility

Vernon, CA

ENVIRONMENTAL NOISE AND VIBRATION ASSESSMENT REVISED TECHNICAL BACKGROUND REPORT

11 August 2025

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Salter Project #25-0036

INTRODUCTION

The Goodman Energy Park project is located in Vernon, CA. It consists of two new data center buildings comprising the Goodman Energy Park Data Center (GEP) and the Vernon Backup Generation Facility (VBGF). This technical background report presents the results of our noise and vibration impact assessment. It summarizes the policies and standards applicable to the Project, noise data obtained from acoustical measurements on-site, and noise and vibration reduction strategies that should be implemented as feasible. Those readers not familiar with the fundamental concepts of environmental noise may refer to Appendix A. Our report has been revised to address the CEC Data Request Set 1.

SUMMARY

- Operational Traffic Noise: Increases in traffic noise on nearby roadways are projected to be minor for local roadways and within the applicable standards.
- Aircraft Noise: The project is not located in the vicinity of a private airstrip or an airport land use plan or within two miles of a public airport or public-use airport, and it is not expected to expose people working in the project area to excessive noise levels.
- Operational Equipment: We expect that operational noise sources of the Project would be able to meet the limits of the City Code. With industry standard vibration isolation measures, equipment vibration is not expected to result in disturbance at the nearest sensitive land-uses. Generators are to be spring isolated to meet the City Code vibration limit.
- Construction Activity: Construction activities are expected to increase noise and vibration at nearby properties above existing ambient levels. Therefore, we are proposing techniques to reduce noise, as feasible.

PROJECT DESCRIPTION

The proposed GEP site will accommodate two buildings (3163 and 3049 East Vernon Avenue). The property is currently zoned “General Industrial with “Commercial-1” and “Slaughtering” overlays. The site formly included a portion of the Smithfield Packaged Meats Corporation warehouses and packaging facilities (now demolished).

The GEP project will consist of construction of two three-story data center buildings of approximately 283,836 square feet each, a utility substation, two backup electrical generator equipment yards (the VBGF), surface parking and landscaping, and related site improvements. The data center buildings will house computer servers for private clients in a secure and environmentally controlled structure. The project will include rooftop HVAC equipment, screening walls, and outdoor back-up power generators that will be supplied with factory sound-attenuation enclosures.

APPLICABLE CRITERIA

State - CEQA Guidelines and Impact Criteria

The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of noise and vibration attributable to a proposed Project, primarily equipment and construction noise. CEQA asks the following applicable questions related to noise (CEQA Guidelines Appendix G).

- Would the Project result in generation of 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, noise ordinance, or applicable standards of other agencies.
- Would the Project result in generation of excessive groundborne vibration or noise levels.
- 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, would the project expose people residing or working in the project area to excessive noise levels?

The site is not located near an airport or exposed to substantial aircraft noise; thus, the last item would not be applicable to the site.

City – Noise Criteria

Vernon General Plan

The Noise Element of the City of Vernon General Plan sets forth noise and land use compatibility standards for proposed land uses (Noise Element Figure N-3 included below). In summary, the City establishes the following outdoor noise levels as the upper end of the range considered "Clearly" and "Normally Compatible" for each land-use near the Project.

	"Clearly Compatible"	"Normally Compatible"
• Residential:	CNEL 60 dB[1]	CNEL 75 dB
• Office/Professional:	CNEL 65 dB	CNEL 75 dB
• Commercial Retail:	CNEL 70 dB	CNEL 80 dB
• Manufacturing/Utilities:	CNEL 70 dB	CNEL 85 dB

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[1] DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn}.

CNEL (Community Noise Equivalent Level) – A descriptor for a 24-hour A-weighted average noise level. CNEL accounts for the increased acoustical sensitivity of people to noise during the evening and nighttime hours. CNEL penalizes sound levels by 5 dB during the hours from 7 PM to 10 PM and by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the CNEL and DNL are usually interchangeable.

Figure N-3: Community Noise Standards

Land Use Category	CNEL, dB						
	50	55	60	65	70	75	80
Residential - Multi-family, Duplex	A	A	B	B	B	C	C
Schools, Churches	A	A	B	C	C	C	D
Office Building, Research & Development, Professional Offices, City Office Building	A	A	A	B	B	C	C
Commercial Retail, Banks, Restaurants	A	A	A	A	B	B	C
Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Agriculture	A	A	A	A	A	A	A

A — **CLEARLY COMPATIBLE**
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional contruction without any special noise insulation requirements.

B — **NORMALLY COMPATIBLE**
New construction or development should be undertaken only after detailed analysis of the noise reduction requirements is made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

C — **NORMALLY INCOMPATIBLE**
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.

D — **CLEARLY INCOMPATIBLE**
New construction or development should generally not be undertaken.

Applicable noise goals and policies contained in the Noise Element are as follows:

- GOAL N-2: Incorporate noise and vibration considerations into land use planning decisions.
  - POLICY N-2.1: Consider the noise levels likely to be produced by any new businesses or substantially expanded business activities locating near existing noise-sensitive uses such as schools, community facilities, and residences, as well as adjacent to established businesses involving vibration-sensitive activities.
  - POLICY N-2.2: Encourage acoustical design in all new construction.
- GOAL N-3: Develop measures to control non-transportation noise and similar impacts.

- POLICY N-3.1: Continue to enforce the noise and vibration performance standards in the City Code to mitigate conflicts among neighboring uses.

Applicable action items contained in the General Plan Implementation Plan are as follows:

- Action N-1: Noise Regulations. Continue to enforce City noise regulations contained in the Zoning Ordinance to protect residents and school children from excessive noise levels associated with stationary noise sources. Periodically evaluate regulations for adequacy and revise, as needed, to address community needs and changes in legislation and technology.
- Action N-2: Siting of New Businesses near Noise-sensitive Land Uses. Review development proposals at properties to determine whether the proposed use has the potential to exceed City one-hour noise standards. As appropriate, require acoustical analyses for all proposed activities that have the potential to exceed the standards, and require mitigation measures if noise analyses show an increase in noise levels beyond the City standards.

Vernon Municipal Code

The City's Zoning Code states the following for sites within the General Industry Zone:

17.22.070 Part B.2

Noise. Upon a change of use or the occurrence of an event described in Table 7.64.030, Right to Continue Nonconforming Uses and Buildings, that requires compliance with the development standards, all of the businesses located on the lot shall be operated in compliance with the following noise standards:

a. *The following noise standards, unless otherwise specifically indicated, shall apply to all lots within the designated noise zones, measured cumulatively with existing noise from all businesses on the lot:*

Table 17.22.070 Noise Standards

Noise Zone	Time Interval	Allowable Exterior Noise
Lots located within 1/10 of a mile of any residence or school located in Vernon or abutting communities	10:00 p.m. to 7:00 a.m.	60 dBA
	7:00 a.m. to 10:00 p.m.	65 dBA
All other lots	Any time	75 dBA

b. *No person, in any location within the City, shall create any noise, or allow the creation of noise, on any lot owned, leased, occupied or otherwise controlled by such person which causes the cumulative noise level when measured at any point along the lot line of the lot on which the source of the noise is located to exceed:*
   i. *The applicable noise standard for a cumulative period of more than 30 minutes in any hour; or*

- *ii. The applicable noise standard plus five dBA for a cumulative period of more than 15 minutes in any one hour; or*
- *iii. The applicable noise standard plus 10 dBA for a cumulative period of more than five minutes in any hour; or*
- *iv. The applicable noise standard plus 15 dBA for a cumulative period of more than one minute in any hour.*

c. In the event the ambient noise level exceeds any of the noise limit categories set forth in subsection (B)(2)(b) of this section, the cumulative period applicable to such category shall be increased to reflect the ambient noise level, plus five dBA.

d. If a lot is located on a boundary between two different noise zones, the noise level standard applicable to the quieter noise zone shall apply.

e. If the noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be determined, the measured noise level obtained while the source is in operation shall be compared directly to the lot's designated noise zone for the time of day the noise level is measured.

f. Any noise source in excess of the standards set forth herein shall be permitted only with a Conditional Use Permit.

Since there is no exception for backup generators in the City Code, we understand that regular testing of backup generators is expected to meet the Zoning Code noise standard of Table 17.22.070. Furthermore, in light of Item 17.22.070.B.2.d, related parts of Sections 17.28.040 and 17.32.050 also apply the noise standards of Table 17.22.070 to the neighboring properties in the Commercial-1 and Commercial-2 zoning overlays.

City – Vibration Criteria

Vernon Municipal Code

Section 17.22.070 Part B.1 of the City Code states the following.

Vibration. Upon a change of use or the occurrence of an event described in Table 17.64.030, Right to Continue Nonconforming Uses and Buildings, that requires compliance with the development standards, all of the businesses located on the lot shall be operated so that, cumulatively with existing vibrations of all new and existing equipment of all businesses on the lot, the steady ground vibration inherently and recurrently generated shall not exceed four hundredths of one inch per second particle velocity when measured at any point along the lot line of the lot on which the source of the vibration is located. The cumulative effect of vibrations in excess of four hundredths of one inch measured at any point along the lot line on which the source of the vibration is located shall be permitted only with a Conditional Use Permit.

Additional Criteria for Construction Vibration

CEQA does not define vibration levels that are considered excessive, and the City does not appear to have vibration limits for temporary activities, such as construction. Therefore, we used significance criteria based on information published by the State and our experience. The Caltrans "Transportation and Construction Vibration Guidance Manual" (September 2013) includes guidelines for the assessment of construction vibration. We are referencing these for the evaluation of vibration levels measured during Project construction activities. They relate to both potential building damage and human perception. **Tables 1 and 2** below are excerpts from the Caltrans manual with applicable thresholds highlighted, which range between 0.3 to 1.0 PPV (in/sec) for potential damage to residential structures and 0.01 to 0.25 PPV (in/sec) for human perception (PPV is 'peak particle velocity').

Table 1: Guideline Vibration Damage Potential Threshold Criteria (Maximum PPV, in/sec)

Structure and Condition	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12 PPV	0.08 PPV
Fragile buildings	0.2 PPV	0.1 PPV
Historic and some old buildings	0.5 PPV	0.25 PPV
Older residential structures	0.5 PPV	0.3 PPV
New residential structures	1.0 PPV	0.5 PPV
Modern industrial/commercial buildings	**2.0 PPV**	**0.5 PPV**

Table 2: Guideline Vibration Annoyance Potential Criteria (Maximum PPV, in/sec)

Subjective Effect	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04 PPV	0.01 PPV
Distinctly perceptible	**0.25 PPV**	**0.04 PPV**
Strongly perceptible	0.9 PPV	0.1 PPV
Severe	2.0 PPV	0.4 PPV

To address the qualitative vibration standards described in CEQA and the City municipal code, we propose that the following threshold limits (shown in **bold in Tables 1 and 2**) be applied:

<u>For nearby structures (Per Table 1):</u>

- Transient sources – 2.0 PPV, in/sec
- Continuous sources – 0.5 PPV, in/sec

<u>For human perception (Per Table 2):</u>

- Transient sources – 0.25 PPV, in/sec
- Continuous sources – 0.04 PPV, in/sec

For reference, the City limit for permanent/operational vibration is 0.04 PPV, in/sec

EXISTING NOISE AND VIBRATION-SENSITIVE RECEPTORS

The properties surrounding the site are zoned as General Industry (I). Areas along S Soto Street are also within the Commercial-1 and Commercial-2 zoning overlays. In summary, the GEP project equipment noise cannot generate a noise level above 75 dBA at the boundary of the GEP property (unless ambient noise levels exceed this standard).

EXISTING (AMBIENT) NOISE ENVIRONMENT

To quantify the ambient noise levels around the site, we focused on the L50[2] metric which is consistent with the City Code for noise that could occur for a "cumulative period of more than 30 minutes in any hour." Noise levels were measured from 31 January to 3 February 2025 at the site. Tables 3 and 4 and **Figure 1** summarize the measured noise levels and measurement locations. The ambient noise levels at the neighboring properties are below the limits set in the City Code. Therefore, the City Code noise standards cannot be adjusted higher as described in the Code. For hourly data of the long-term measurement locations see **Appendix B**.

Table 3: Comparison of City Code Limits to Measured Ambient Noise Levels

Location	Measured Ambient Noise Levels (Hourly, Leq)	Measured Ambient Noise Levels (Hourly, L50)	City Code Noise Limit	Comment
LT-1: West S Soto Street	69 to 78 dBA	60 to 71 dBA	75 dBA	City Code noise standard cannot be adjusted higher
LT-2: South E Vernon Avenue	62 to 71 dBA	56 to 65 dBA	75 dBA	
ST-1: North Bandini Blvd	68 to 77 dBA	59 to 70 dBA*	75 dBA	

Table 4: Measured Ambient Noise Levels, per City General Plan Community Noise Standards

Location	Measured Ambient Noise Levels (dBA)
LT-1: West (S Soto Street)	CNEL 77 dB to CNEL 82 dB
LT-2: South (E Vernon Avenue)	CNEL 70 dB to CNEL 74 dB
ST-1: North (Bandini Blvd)	CNEL 76 dB to CNEL 81 dB*

*Note: Range of noise levels at an "ST" location is estimated based on a simultaneous short-term measurement at the "ST" location and other nearby long-term measurements.

2 L_n – The sound level exceeded for a stated percentage (n) of a specified measurement period as described in ASTM E1686. L_{10}, L_{50}, and L_{90} are the levels exceeded 10, 50, and 90 percent of the time, respectively.

FIGURE 1: Site ambient noise measurement locations.

Ambient noise measurements indicate that the site is exposed to noise that would be considered "Normally Compatible" with such a land-use. At "Normally Compatible" sites, new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features in the design are determined. Though CEQA noise impact assessment does not include the evaluation of existing community noise onto the project, we note that outdoor noise intrusion to occupied office areas of the project would need to be addressed in the building construction to confirm that interior noise levels in occupied areas would be attenuated to meet the standards of CALGreen Code Section 5.507.4.

ANALYSIS/METHODOLOGY

The project includes revised use of the site, construction of new buildings, and related site work and future operational noise and vibration sources. The impact analysis addresses the following potential sources of noise and vibration:

- Additional vehicular traffic noise associated with the project
- Operational noise and vibration from HVAC equipment

- Operational noise and vibration from backup generator equipment
- Construction noise and vibration

A summary of our analysis methodology is listed below:

- Traffic noise analysis is based on the expected increase traffic noise on local roadways as a result of the project. An increase in traffic noise would be considered significant if it is 3 dB or more.
- Expected operational noise is compared to the City of Vernon General Plan CNEL standards. Noise levels within the “Clearly Acceptable” category are considered to be less than significant. Noise levels within the “Normally Acceptable” category are considered less than significant if they are also within the limits of the City Municipal Code. Separately, expected noise levels are considered less than significant if they are within the limits of the City Municipal Code.
- The City of Vernon does not appear to limit construction noise. Construction is to occur during City-approved hours. Expected construction noise levels are disclosed below. In addition to several noise control measures listed below, it is proposed that construction noise be reduced to a maximum of 90 dBA at nearby occupied areas.
- Operational and construction vibration is compared to the criteria proposed above.

ANALYSIS AND MITIGATION – OPERATIONAL NOISE AND VIBRATION

Operational – Vehicular Traffic Noise

Existing noise levels at the site are in-line with the City standards for “Normally Compatible” noise levels. The project is not expected to substantially increase traffic on neighboring roadways compared to previous conditions. The project is projected to result in 110 staff vehicular trips and 50 visitor trips per day. This is far below the existing traffic volumes on nearby roadways. For reference, the project would need to roughly double the traffic volume on nearby roadways in order to cause a significant increase in ambient noise levels of 3 dB or greater.

Vehicular activity on-site at drive paths and parking lots is not expected to be significantly different than previous activities at portions of the site and neighboring land-uses. This activity is also not expected to exceed the land-use compatibility standards of neighboring receptors.

Summary: If project-related traffic increases noise along nearby roadways the amounts would be minimal and far below the levels that could cause a 3 dB increase.

Operational – Building HVAC Equipment

Mechanical equipment associated with data center includes rooftop chillers and packaged AC units. Based on equipment sound data provided for the equipment, normalized sound levels at a distance of 50 feet are provided below to characterize the source equipment. The project is to include 36 chillers and 2 DOAS RTU (dedicated outside air supply rooftop unit), one MAU RTU (make-up air) and 57 split-system condensing units (CU).

- Air Cooled Chiller: 75 dBA
- Rooftop RTU (DOAS): 67 dBA
- Rooftop RTU (MAU): 58 dBA
- Split-System CU: 20 dBA

Based on these sound levels and the current plans, we calculated noise levels at each nearest neighboring property in each direction. Our analysis accounts for the acoustical shielding expected from the parapet wall for a receiver at grade (height of 5 feet). Projected noise levels account for receiver locations at the property line and at a neighboring property that is across the street from the project (whichever location would be louder, to be conservative).

The results of our analysis are summarized in **Table 5A** below which shows that building HVAC systems can meet the City Code noise limits. The hourly L_{50} is expected to be similar to the hourly Leq. A graphical noise contour map illustrating the sound levels of Table 5 is included in **Appendix C** as **Map 1**. The receiver locations evaluated in Table 5 are identified on the site plan, as shown in **Figure 2**.

Table 5A: Rooftop HVAC Equipment Analysis Results Summary – Per City Code

Direction	Calculated HVAC Equipment Noise Level	City Code Noise Limit
South (along E Vernon)	67 to 71 dBA	75 dBA
West (along S Soto)	64 dBA	
North (adjacent property)	64 to 67 dBA	
East (adjacent property)	70 dBA	

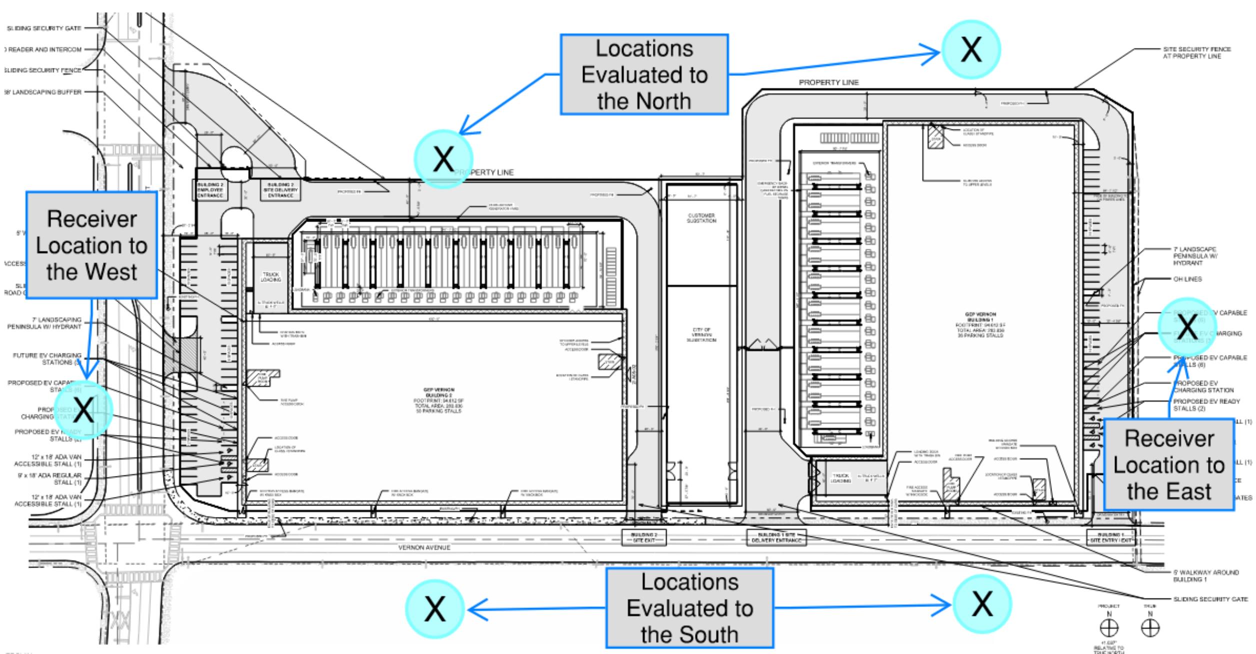


FIGURE 2: Receiver locations evaluated for building HVAC equipment.

Table 5B below is similar but shows that building HVAC system noise is expected to be within the City General Plan "Normally Compatible" noise standard. These A-weighted CNEL noise levels are calculated with the conservative assumption that all proposed rooftop HVAC equipment is operating at full load for 24 hours. Though the noise levels to the immediate south and east properties are expected to exceed the City General Plan "Clearly Compatible" noise standard, we found that the noise is also expected to meet the City Code noise limits.

Table 5B: Rooftop HVAC Equipment Analysis Results Summary – Per City General Plan

Direction	Calculated HVAC Equipment Noise Level	City General Plan "Normally Compatible" Noise Standard
South (along E Vernon)	CNEL 77 dB	CNEL 80 to 85 dB
West (along S Soto)	CNEL 71 dB	
North (adjacent property)	CNEL 74 dB	
East (adjacent property)	CNEL 77 dB	

Summary: Mechanical systems can be selected and designed to meet City Code noise limits. The noise levels would also be within the City General Plan "Normally Compatible" noise standard. Though the currently scheduled equipment noise is expected to meet these standards, a noise study report should be prepared during the final design phase of the project to confirm noise would be adequately reduced if the design is revised prior to construction. A qualified professional should be involved to perform this final noise analysis.

Operational – Building Backup Generator

Backup generators are used in emergency scenarios and must also be tested occasionally. We understand that the noise limits do not apply to backup generators when operating in an emergency scenario. However, we assume that short-term testing of generators is to meet the City noise limits. Each building is expected to have 19 large 3 MW generators and 1 smaller 1 MW generator. We based our analysis of generator noise on the currently selected system and enclosure that is rated to generate a sound level of 70 dBA at a distance of 23 feet (7 m). The results of our analysis are summarized in **Tables 6, 7, and 8**.

For reference, **Table 6** lists the calculated noise levels from simultaneous operation of the building HVAC systems and one (1) backup generator during a regular testing scenario. The receiver locations evaluated in Table 6 are identified on the site plan, as shown in **Figure 3**.

Table 6: GENERATOR Analysis Results Summary – One Generator alone (70 dBA at 23 ft)

Direction	Calculated Generator Noise Level	City Noise Limit
South (along E Vernon)	56 dBA	75 dBA
West (along S Soto)	54 dBA	
North (adjacent property)	62 dBA	
East (adjacent property)	37 dBA	

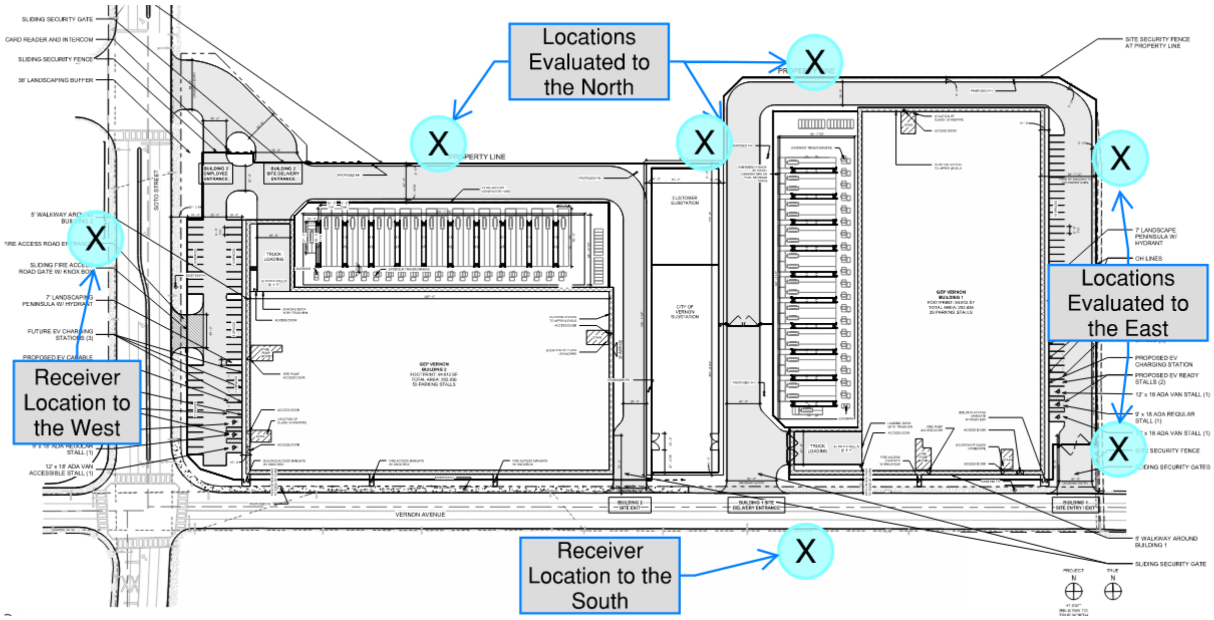


FIGURE 3: Receiver locations evaluated for backup generator equipment.

Table 7A lists the calculated noise levels from simultaneous operation of the building HVAC systems and one (1) backup generator during a regular testing scenario. These results are most representative of the maximum anticipated noise levels during regular generator testing. One generator would be notably quieter than building HVAC. In fact, with one generator being tested at a time, the City noise limit could be met with an alternate generator rated up to 80 dB at a distance of 23 feet. A graphical noise contour map illustrating the sound levels of **Table 7** is included in **Appendix C** as **Map 2**. The receiver locations evaluated in Table 7 are identified on the site plan, as shown in **Figure 2** above.

Table 7A: GENERATOR Analysis Results Summary – Cumulative One Generator and Building HVAC Per City Municipal Code

Direction	Calculated Equipment Noise Level	City Code Noise Limit
South (along E Vernon)	71 dBA	75 dBA
West (along S Soto)	65 dBA	
North (adjacent property)	68 dBA	
East (adjacent property)	70 dBA	

Table 7B below is similar but shows that cumulative building HVAC and generator testing noise is expected to be within the City General Plan "Normally Compatible" noise standard. These A-weighted CNEL noise levels are calculated with the assumption that all proposed rooftop HVAC equipment is operating at full load for 24 hours and generators are each tested in succession during daytime hours. Though the noise levels to the immediate south and east properties are expected to exceed the City General Plan "Clearly Compatible" noise standard, we found that the noise is also expected to meet the City Code noise limits.

Table 7B: GENERATOR Analysis Results Summary – Cumulative One Generator and Building HVAC Per City General Plan

Direction	Calculated HVAC Equipment Noise Level	City General Plan "Normally Compatible" Noise Standard
South (along E Vernon)	CNEL 77 dB	CNEL 80 to 85 dB
West (along S Soto)	CNEL 71 dB	
North (adjacent property)	CNEL 74 dB	
East (adjacent property)	CNEL 77 dB	

Table 8 lists the calculated noise levels from all backup generators operating simultaneously. These data are provided for reference even though this condition is not expected to regularly occur. However, with the current generator model being proposed, noise would still comply with the City noise limit. The receiver locations evaluated in Table 8 are identified on the site plan, as shown in **Figure 3** above.

Table 8: GENERATOR Analysis Results Summary – All Generators Running Simultaneously

Direction	Calculated Generator Noise Level	City Noise Limit
South (along E Vernon)	69 dBA	75 dBA
West (along S Soto)	67 dBA	
North (adjacent property)	74 dBA	
East (adjacent property)	50 dBA	

Summary: Building systems can be selected and designed to meet City Code noise limits. Cumulative noise of rooftop HVAC systems along with generator testing would be within the City General Plan "Normally Compatible" noise standard. With one generator (rated at 70 dB at 23 feet) being tested at a time, the cumulative noise from the generator and building HVAC systems is calculated to comply with the limit. In fact, cumulative noise would still comply with the City noise limit even if an alternative generator rated as high as 80 dB at 23 feet were to be selected. In an alternative generator system is ultimately selected, a noise study report should be prepared during the final design phase of the project to confirm any necessary attenuation measures. A qualified professional should be involved to perform this final noise analysis.

Operational – Equipment Vibration

Vibrating equipment has the potential to generate vibration at neighboring properties. The backup-generators are located at grade foundations and as close as 55 feet from the property line. Assuming that the regular monthly testing of the generators must meet the 0.04 PPV inch/second limit at adjacent properties, vibration isolation of the generators is expected to be necessary. The generators should be vibration isolated with spring mounts selected to have a minimum 1-inch static deflection. Seismic restraints, as needed, should be provided and installed/adjusted such that they do not compromise the vibration isolation performance.

HVAC equipment inside the building and on the roof is expected to be vibration isolated per industry standard measures (e.g., per ASHRAE guidelines). Therefore, the equipment is not expected generate significant vibration levels beyond the immediate vicinity of the equipment.

Summary: Backup generators are to be installed on spring vibration isolation mounts to reduce operational vibration at the property lines to meet the City Code vibration limit. HVAC equipment is to be vibration isolated per ASHRAE guidelines (contained in the most recent HVAC Applications Handbook).

ANALYSIS AND MITIGATION – CONSTRUCTION NOISE AND VIBRATION

Construction Phases and Equipment

Based on experience with similar projects, Table 9 summarizes the equipment expected to be used in each phase of construction.

Table 9: Expected Construction Equipment per Phase

	Concrete	Auger Cast Piles	Paving	Grading	Utilities	Steel Erection	Bldg. Envelope	Finishes
Rubber Tired Dozers	X	X		X	X		X	
Excavators				X	X			
Loaders/Backhoes	X	X		X	X		X	X
Cranes	X	X				X	X	
Drill Rig		X						
Forklifts	X	X		X		X	X	X
Generator Sets						X		
Welders						X		
Pavers			X	X				
Vibratory Compactor			X	X				
Concrete Pump	X	X						
Air Compressors		X						

Concrete pump, air compressor, drill rig, forklifts, loaders, backhoes, excavators, dozers

Construction Equipment Noise - General

Tables 10 and 11 summarizes the typical construction noise levels[3] expected per construction phase at nearby receptors (based on the types of equipment to be used). **Table 10** lists the range of maximum noise levels (Lmax) to be expected from each of a variety of planned equipment. **Table 11** lists the typical aggregate noise levels (Leq) expected per phase based on concurrent operation of all equipment and "usage factors" published by FHWA and Caltrans (i.e., between 20% and 50% operation per hour) for each activity. The levels listed are thus the highest hourly average noise levels expected during each phase. The calculation distances are increased to account for the spatial spreading of equipment around the project site. Noise levels might be further reduced by any temporary fencing or structures that are not included in our analysis (to be conservative). A graphical noise contour map illustrating the highest expected noise levels (Leq) of **Table 11** is included in **Appendix C** as **Map 3**.

3 Sources: US DOT Federal Highway Administration (FHWA) "Construction Noise Handbook" (2006), the US DOT Federal Transit Administration (FTA) "Transit Noise and Vibration Impact Assessment Manual" (September 2018), and CALTrans "Technical Noise Supplement to the Traffic Noise Analysis Protocol" (September 2013)

Table 10: Range of Maximum Noise Levels (Lmax) from Various Construction Equipment, at distance beyond property line

Construction Phase	Equipment	Noise at 50 ft (dBA)	Noise at 100 ft (dBA)	Noise at 200 ft (dBA)
Grading, Site Work, Utilities	Pavers, compactors, forklifts, loaders, backhoes, excavators, dozers	74 to 89	68 to 83	62 to 77
Foundations & Concrete	Concrete pump, air compressor, drill rig, forklifts, loaders, backhoes, excavators, dozers	79 to 85	73 to 79	67 to 73
Building Construction	Cranes, Forklifts, Generator, Tractors, Loaders, Backhoes, Welders	73 to 85	67 to 79	61 to 73

Table 11: Typical Average Construction Equipment Noise Levels (Leq) (aggregate of all equipment per construction phase), at distance beyond property line

Construction Phase	Noise at 50 ft (dBA)	Noise at 100 ft (dBA)	Noise at 200 ft (dBA)
Grading, Site Work, Utilities	83	80	75
Foundations & Concrete	82	79	74
Building Construction	80	77	72

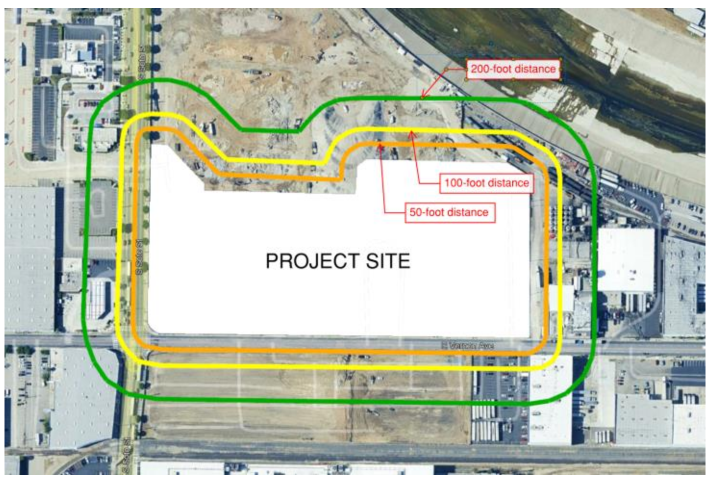


FIGURE 4: Illustrated distances for construction noise analysis above

Construction noise levels are expected to be below 90 dBA at the nearest property receptors. These are industrial land-uses. The City of Vernon does not expressly limit construction noise. Construction will occur within the allowable hours where applicable. Nonetheless, noise-generating activities over the construction period, though temporary, could increase ambient noise levels at neighboring land-uses. Reasonable measures to manage construction activities should be implemented to reduce the potential noise impact, as feasible. We understand that impact pile driving will not be required for this project.

1. Require posted signs at the construction site that include permitted construction days and hours, a day and evening contact number for the job site and a day and evening contact number for the City in the event of problems.
2. Notify the City and neighbors within 300 feet in advance of the schedule for each major phase of construction and expected loud activities.
3. When feasible, locate noisy stationary equipment (e.g., generators, pumps, compressors) and material unloading and staging areas away from the sensitive adjacent uses (school and residences).
4. Provide temporary noise barrier fences for heavy impact equipment used during demolition that has the potential to generate very high noise levels, above 90 dBA at 50 feet.
5. Require that all construction equipment be in good working order and that mufflers are inspected to be functioning properly. If feasible, impact tools shall be shrouded or shielded with intake and exhaust port mufflers when used near noise-sensitive receptors.
6. Avoid unnecessary idling of equipment and engines and to a maximum of 15 minutes near noise-sensitive receptors.
7. Consider means to reduce the use of heavy impact tools and locate these activities away from the property line as feasible.
8. Use hydraulic or electric-powered tools wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools
9. Minimize drop height when loading excavated materials onto trucks.
10. Minimize drop height when unloading or moving materials on-site.
11. House air compressors, generators, and other loud stationary equipment in a sound-attenuating enclosure whenever located near sensitive receptors.
12. Utilize temporary power service from the utility company instead of mobile generators whenever feasible.

Construction Equipment Vibration - General

Table 12 presents typical vibration levels[4] that could be expected from construction equipment at the setbacks of nearby sensitive receptors (75 and 100 feet). Note that exact vibration levels will vary depending on soil conditions, construction methods, and equipment used at the site.

[4] Sources: Caltrans "Transportation and Construction Vibration Guidance Manual" (April 2020) and the US DOT FTA "Transit Noise and Vibration Impact Assessment Manual" (September 2018). Estimated levels are calculated per the Caltrans published formula $PPVequipment = PPVref (25/D)^n$, where PPVref is the reference PPV at 25 feet, D is the distance from the equipment to the receiver (in feet), and n is a reference value of 1.1.

Table 12: Expected Construction Vibration Levels Compared to Recommended Thresholds

Location	Nearest Receptors	Other Receptors	Human Perception Thresholds	Building Damage Thresholds
Equipment	**PPV at 50 ft. (in/sec)**	**PPV at 100 ft. (in/sec)**	**PPV (in/sec)**	**PPV (in/sec)**
Rubber Tired Dozers	0.05	0.01	0.04 for continuous sources 0.25 for transient sources	0.5 for continuous sources 2.0 for transient sources
Excavators	0.05	0.01		
Impactor	0.05	0.01		
Tractors/Loaders/Backhoes	0.05	0.01		
Concrete/Industrial Saws	0.05	0.01		
Bore/Drill Rigs	0.05	0.01		
Graders	0.05	0.01		
Cranes	0.03	0.01		
Forklifts	0.00	0.00		
Generator Sets	N/A	N/A		
Welders	N/A	N/A		
Pavers	0.05	0.01		
Cement and Mortar Mixers	0.03	0.01		
Vibratory Rollers	**0.10**	0.02		

Most construction activities are expected to generate maximum vibration levels that are below standard thresholds building damage and in the acceptable range for human perception at nearby sensitive receptors, with the exception of vibratory rollers. Vibration from vibratory rollers would exceed the threshold of 0.04 PPV (in/sec) up to a distance of approximately 120 feet. However, there are no residential receptors at such a close distance. Therefore, we find that no additional vibration reduction methods are needed.

* * *

Please let us know if you have any questions.

APPENDIX A – FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL NOISE

This section provides background information to aid in understanding the technical aspects of this report. Three dimensions of environmental noise are important in determining subjective response. These are:

- The intensity or level of the sound
- The frequency spectrum of the sound
- The time-varying character of the sound

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing. The "frequency" of a sound refers to the number of complete pressure fluctuations per second in the sound. The unit of measurement is the cycle per second (cps) or hertz (Hz). Most of the sounds, which we hear in the environment, do not consist of a single frequency, but of a broad band of frequencies, differing in level. The name of the frequency and level content of a sound is its sound spectrum. A sound spectrum for engineering purposes is typically described in terms of octave bands, which separate the audible frequency range (from about 20 to 20,000 Hz) into ten segments.

Many rating methods have been devised to permit comparisons of sounds having quite different spectra. Surprisingly, the simplest method correlates with human response practically as well as the more complex methods. This method consists of evaluating all of the frequencies of a sound in accordance with a weighting that progressively de-emphasizes the importance of frequency components below 1000 Hz and above 5000 Hz. This frequency weighting reflects the fact that human hearing is less sensitive at low frequencies and at extreme high frequencies relative to the mid-range.

The weighting system described above is called "A"-weighting, and the level so measured is called the "A-weighted sound level" or "A-weighted noise level." The unit of A-weighted sound level is sometimes abbreviated "dBA." In practice, the sound level is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting characteristic. All U.S. and international standard sound level meters include such a filter. Typical sound levels found in the environment and in industry are shown in **Figure A**.

Although a single sound level value may adequately describe environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise is a conglomeration of distant noise sources, which results in a relatively steady background noise having no identifiable source. These distant sources may include traffic, wind in trees, industrial activities, etc. and are relatively constant from moment to moment. As natural forces change or as human activity follows its daily cycle, the sound level may vary slowly from hour to hour. Superimposed on this slowly varying background is a succession of identifiable noisy events of brief duration. These may include nearby activities such as single vehicle pass-bys, aircraft flyovers, etc. which cause the environmental noise level to vary from instant to instant.

To describe the time-varying character of environmental noise, statistical noise descriptors were developed. "L10" is the A-weighted sound level equaled or exceeded during 10 percent of a stated time period. The L10 is considered a good measure of the maximum sound levels caused by discrete noise events. "L50" is the A-weighted sound level that is equaled or exceeded 50 percent of a stated time period; it represents the median sound level. The "L90" is the A-weighted sound level equaled or exceeded during 90 percent of a stated time period and is used to describe the background noise.

As it is often cumbersome to quantify the noise environment with a set of statistical descriptors, a single number called the average sound level or "L_{eq}" is now widely used. The term "L_{eq}" originated from the concept of a so-called equivalent sound level which contains the same acoustical energy as a varying sound level during the same time period. In simple but accurate technical language, the L_{eq} is the average A-weighted sound level in a stated time period. The L_{eq} is particularly useful in describing the subjective change in an environment where the source of noise remains the same but there is change in the level of activity. Widening roads and/or increasing traffic are examples of this kind of situation.

In determining the daily measure of environmental noise, it is important to account for the different response of people to daytime and nighttime noise. During the nighttime, exterior background noise levels are generally lower than in the daytime; however, most household noise also decreases at night, thus exterior noise intrusions again become noticeable. Further, most people trying to sleep at night are more sensitive to noise. To account for human sensitivity to nighttime noise levels, a special descriptor was developed. The descriptor is called the L_{dn} (Day/Night Average Sound Level), which represents the 24-hour average sound level with a penalty for noise occurring at night. The L_{dn} computation divides the 24-hour day into two periods: daytime (7:00 am to 10:00 pm); and nighttime (10:00 pm to 7:00 am). The nighttime sound levels are assigned a 10 dB penalty prior to averaging with daytime hourly sound levels.

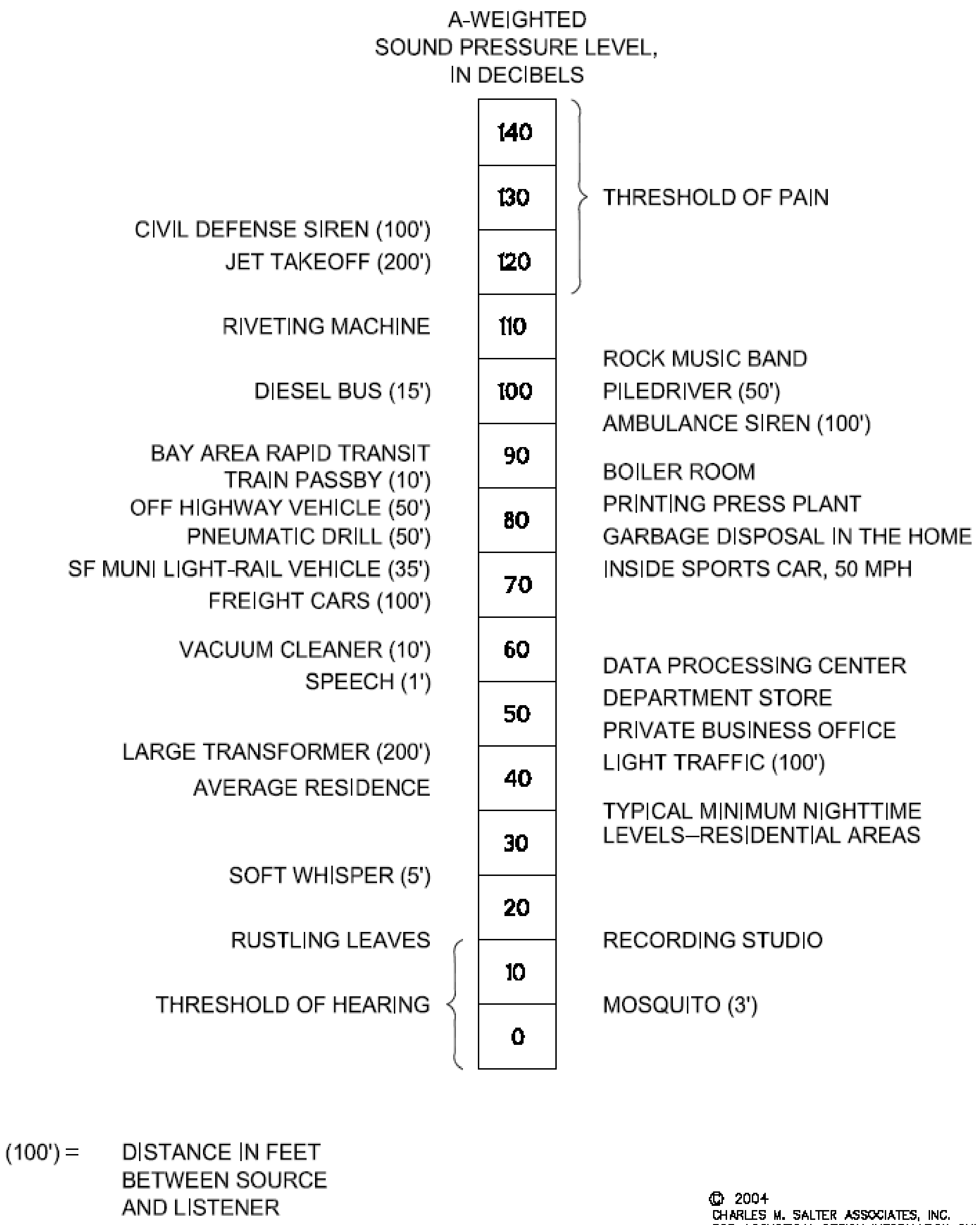
The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as startle, hearing loss

The sound levels associated with environmental noise usually produce effects only in the first two categories. Unfortunately, there has never been a completely predictable measure for the subjective effects of noise nor of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over time.

Thus, an important factor in assessing a person's subjective reaction is to compare the new noise environment to the existing noise environment. In general, the more a new noise exceeds the existing, the less acceptable the new noise will be judged.

With regard to increases in noise level, knowledge of the following relationships will be helpful in understanding the quantitative sections of this report. Except in carefully controlled laboratory experiments, a change of only 1 dB in sound level cannot be perceived. Outside of the laboratory, a 3 dB change is considered a just-noticeable difference. A change in level of at least 5 dB is required before any noticeable change in community response would be expected. A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse community response.



TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

FIGURE A

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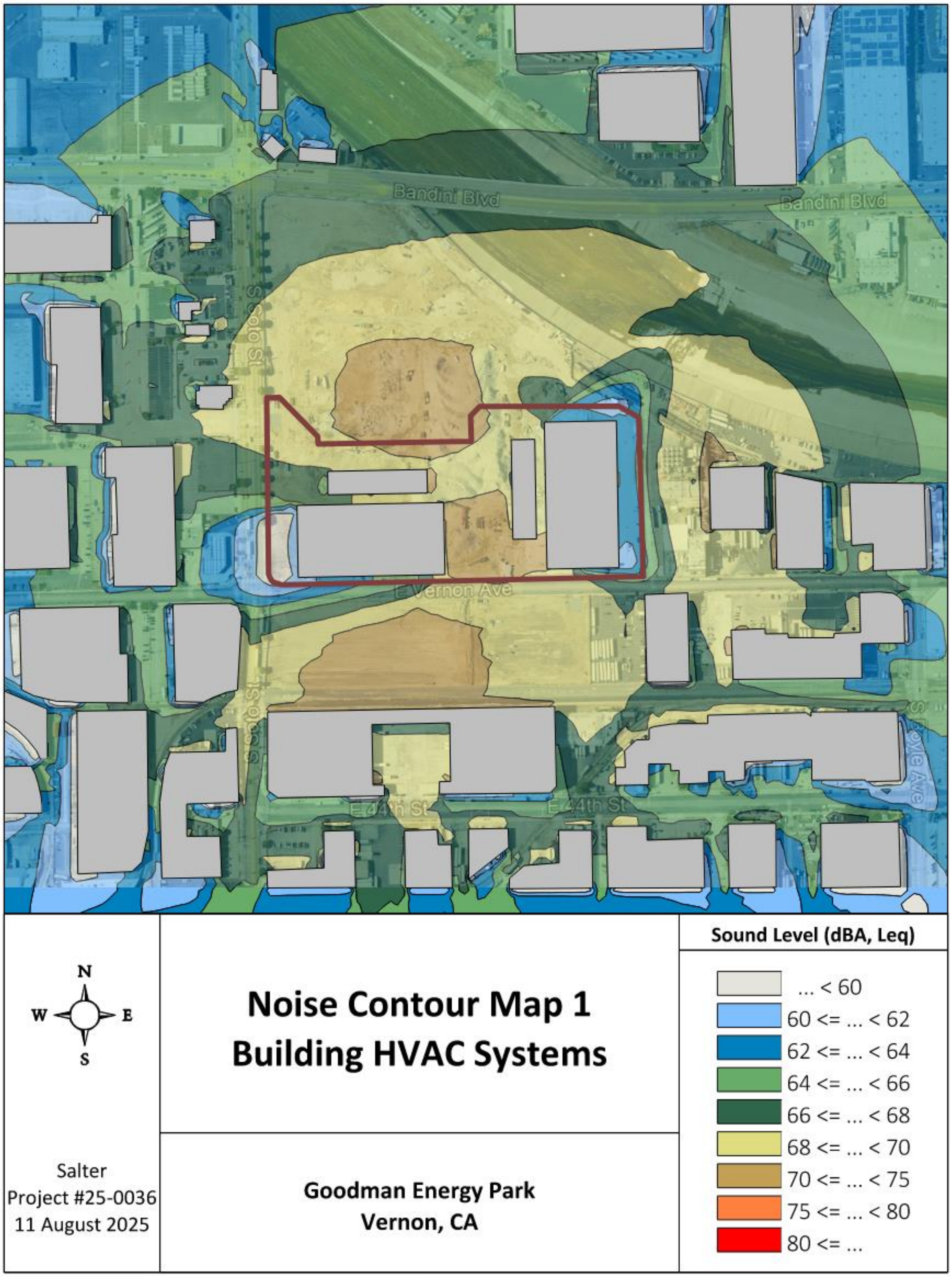
APPENDIX B – MEASURED HOURLY AMBIENT NOISE LEVELS

Ambient noise levels were measured from 31 January to 3 February 2025 at the site. The range of typical ambient noise levels listed in Table 3 above is provided below with hourly detail. Each hourly data point is the arithmetic average of the levels measured during that hour over the course of the 4-day measurement period.

Table B-1: Typical Hourly Ambient Noise Levels (dBA)

Hour	Location LT-1 (S Soto St)		Location LT-2 (E Vernon Ave)	
	Leq	L50	Leq	L50
0:00	70	62	62	56
1:00	69	60	62	56
2:00	70	61	64	56
3:00	70	61	65	57
4:00	71	63	65	58
5:00	73	66	67	59
6:00	78	68	69	60
7:00	74	69	69	61
8:00	76	69	70	62
9:00	74	70	70	62
10:00	75	70	70	61
11:00	75	70	69	61
12:00	75	70	70	62
13:00	76	71	70	63
14:00	75	71	70	63
15:00	76	71	70	64
16:00	75	71	71	65
17:00	75	71	69	63
18:00	75	71	68	61
19:00	74	70	67	60
20:00	74	68	65	58
21:00	74	67	64	58
22:00	72	66	64	57
23:00	71	64	63	57

APPENDIX C – NOISE CONTOUR MAPS



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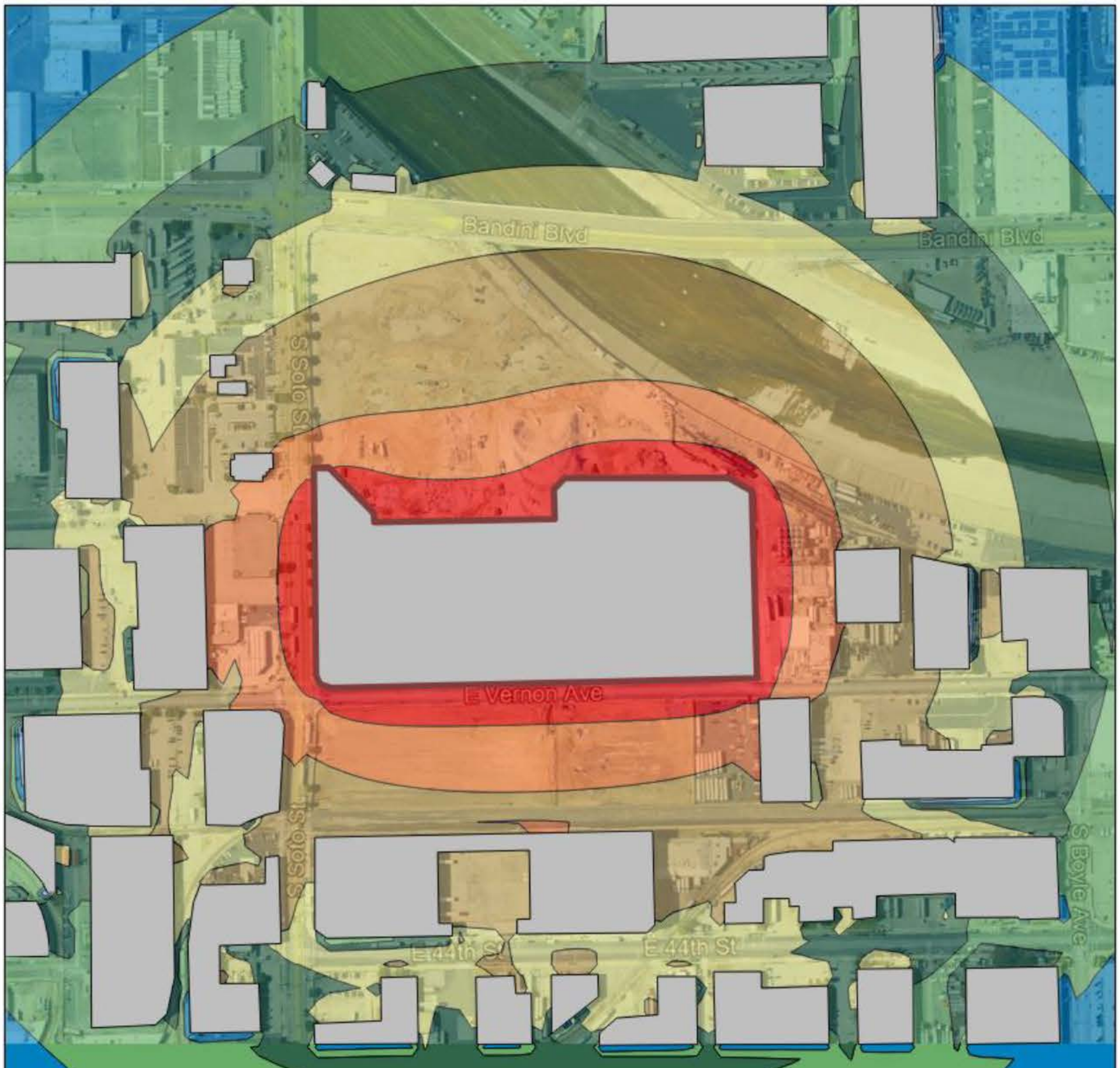
Project #25-0036
11 August 2025

Noise Contour Map 2
Building HVAC and
Backup Generator Testing

Goodman Energy Park
Vernon, CA

Sound Level (dBA, Leq)

	... < 60
	60 <= ... < 62
	62 <= ... < 64
	64 <= ... < 66
	66 <= ... < 68
	68 <= ... < 70
	70 <= ... < 75
	75 <= ... < 80
	80 <= ...



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Project #25-0036
11 August 2025

Noise Contour Map 3
Construction Noise

Goodman Energy Park
Vernon, CA

Sound Level (dBA, Leq)
... < 60
60 <= ... < 62
62 <= ... < 64
64 <= ... < 66
66 <= ... < 68
68 <= ... < 70
70 <= ... < 75
75 <= ... < 80
80 <= ...