
Appendix 1-N
Residual VCS Operations Noise

MEMORANDUM

To: SoCalGas
From: Mark Storm, INCE Bd. Cert. (Dudek)
Subject: Ventura Compressor Station Modernization Project
Residual Ventura Compressor Station Operations – Noise Technical Memorandum
Date: October 9, 2025
cc: Ronnelle Candia (Dudek), Kristin Starbird (Dudek)
Attachments: Figure 1 – Proximity of Noise-Sensitive Receivers within 1,000 Feet of Project Site
Figure 2 – Predicted Stationary Source Operation Noise from Ventura Compressor Station
Attachment A – Locations of Baseline Outdoor Ambient Sound Level Survey
Attachment B – Operation Noise Prediction Model Inputs

To support the predictive noise assessment of Ventura Compressor Station Modernization (Project) Site Alternatives, Dudek has developed an outdoor noise propagation model (with commercially available DataKustik CadnaA software, which is based upon relevant International Organization for Standardization 9613-2 methodology) for the existing SoCal Gas® Ventura Compressor Station (VCS) site, from which operation noise levels representing "future" residual VCS operation conditions are anticipated—if indeed a compressor station site alternative is built and operates. The contents and organization of this memorandum are as follows: Executive Summary, Assessment Framework, Approach and Methodology, Results, and References Cited.

1 Executive Summary

Should a Site Alternative be selected (from among “Avocado,” “Devils’ Canyon,” or “Ventura Steel” options, each of which is studied under separate cover) upon which a new compressor station would be built and operated, aggregate noise emission from residual on-site VCS electromechanical systems (standby generator, air compressor, and meter run system) would not be expected to cause exceedances of local City of Ventura exterior noise thresholds or cause a substantial increase in existing outdoor ambient sound levels. On the contrary, future VCS site noise emission levels are predicted to be several decibels (dB) less than that of the existing measurable background sound environment.

2 Assessment Framework

2.1 Acoustical Fundamentals

The following subsections provide the reader a summary of acoustical terminology and concepts that the subsequent analyses would use to evaluate potential noise and vibration impacts associated with the Project.

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (μPa). One μPa is approximately one hundred billionth (0.0000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 μPa to 100,000,000 μPa . Because of this huge range of values, sound is rarely expressed in terms of μPa . Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of dB. The threshold of hearing for young people is about 0 dB, which corresponds to 20 μPa .

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000 Hz to 8,000 Hz and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an “A-weighted” sound level (expressed in units of dBA [A-weighted decibels]) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise. Noise levels for environmental noise reports are typically reported in terms of dBA. Table 1 describes typical A-weighted noise levels for various noise sources.

Table 1. Typical A-Weighted Noise Levels for Common Indoor and Outdoor Sources

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Diesel truck at 50 feet at 50 mph	85	Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime	75	—
Gas lawn mower, 100 feet	70	Vacuum cleaner at 10 feet
Commercial area	65	Normal speech at 3 feet
Heavy traffic at 300 feet	60	—
	55	Large business office
Quiet urban daytime	50	Dishwasher next room
	45	—
Quiet urban nighttime	40	Theater, large conference room (background)
Quiet suburban nighttime	35	—
	30	Library
Quiet rural nighttime	25	Bedroom at night, concert hall (background)

Source: Caltrans 2013.

Note: dBA = A-weighted decibels.

Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness would usually be different from what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dB changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz to 8,000 Hz) range (Caltrans 2013). In typical noisy environments, changes in noise of 1 dB to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness (Caltrans 2013). Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3 dB increase in sound, would generally be perceived as barely detectable by average healthy human hearing.

Noise Descriptors

Noise in our daily environment fluctuates over time at varying rates. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors utilized in this analysis.

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an energy average of the sound level occurring over a specified period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a 1-hour period and is the basis for noise abatement criteria used by Caltrans and the Federal Highway Administration. Note that L_{eq} is not an arithmetic average of varying dB levels over a period of time; L_{eq} uses a logarithmic equation for averaging of the energy levels and therefore accounts for greater sound energy represented by higher decibel contributions.
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10 percent of the time, and L_{90} is the sound level exceeded 90 percent of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to each of the A-weighted hourly sound levels ($L_{eq[h]}$) occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn} , CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to each of the A-weighted hourly sound levels ($L_{eq[h]}$) occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5 dB penalty applied to each of the A-weighted hourly sound levels ($L_{eq[h]}$) occurring during evening hours between 7 p.m. and 10 p.m.

Outdoor Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

- **Geometric Spreading:** Sound from a localized source (i.e., an ideal point source) propagates uniformly outward in a spherical pattern (or hemispherical when near a surface). The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Roadways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.
- **Ground Absorption:** The propagation path of noise from a sound emission source to a receptor is usually horizontal and proximate to the ground. Under these conditions, noise attenuation from ground absorption

and reflective wave canceling can add to the attenuation associated with geometric spreading. For acoustically “hard” paths over which sound may traverse (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or “soft” sites (i.e., those sites with an absorptive ground surface between the source and the receptor, such as fresh-fallen snow, soft dirt, or dense vegetative ground cover), an additional ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to cylindrical spreading for line source sound propagation, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance.

- **Atmospheric Effects:** Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound pressure levels can also be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects when distances between a source and receptor are large.
- **Shielding by Natural or Human-Made Features:** A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor would typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. While a line of trees may visually occlude the direct line between a source and a receptor, its actual noise-reducing effect is usually negligible because it does not create a solid barrier. Deep expanses of dense wooded areas, on the other hand, can offer noise reduction under the right conditions.

2.2 Environmental Setting

Noise Sensitive Land Uses

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas typically are considered noise- and vibration-sensitive receptors and may warrant unique measures for protection from intruding noise.

As described in Section 5.13.1 of the *Ventura Compressor Station Modernization Project Proponent's Environmental Assessment*, the VCS site (Assessor's Parcel Number 068-0-142-030) is located at 1555 North Olive Street in the City of Ventura (City), slightly east of State Route 33 (CPUC 2023). The VCS site and adjoining commercial or industrial uses to the north, west, and south are all on Industrial zoned land per the City zoning map (City of Ventura 2020) and would not be considered noise-sensitive land uses. However, there is an existing residence at 1675 North Olive Street on an M-2 zoned parcel that adjoins the northeast corner of the Project Site. Additionally, the following is a list of nearest noise-sensitive receivers, all on R- 1-1AC zoned land, with brief descriptions:

- 186 Forbes Lane (an existing single-family residence)
- 181 West McFarlane Drive (an existing single-family residence)
- E.P. Foster Elementary School (western edge of the property adjoins North Olive Street)

There are other single-family homes on the south side of Forbes Lane and other residential receptors that are farther away from the VCS site, which are depicted in Figure 1, Proximity of Noise-Sensitive Receivers within 1,000 Feet of Project Site. However, Project-attributed noise exposure levels at these more distant locations would tend to be less than those studied at the above five positions on the basis of acoustical principles: sound attenuates with distance-dependent factors that include geometric divergence, air absorption, and ground absorption.

Measured Outdoor Ambient Sound

Outdoor ambient sound levels in the vicinity of the Project Site were monitored over a 7-week period from June 21, 2021, to August 9, 2021 (Survey), using two American National Standards Institute (ANSI) Type 2 sound level meters (SLM). These were SoftdB “Piccolo II” model SLMs (last four digits of serial numbers: 2101 and 2203) placed within the Project Site near the northern access gate along North Olive Street and the southwest corner of the Project Site.¹ Ambient sound data were collected when on-site construction work unrelated to the Project and permitted by the City of Ventura (permit COMP-2-21-74946 for a new communication shelter, microwave tower, foundation for temporary office and storage containers) (site improvements) was taking place. The existing on-site gas compression system was operating normally while construction activities occurred. Sound level monitors collected data continually so that when construction activities were not occurring, ambient operating noise levels could be collected and assessed, establishing baseline operational noise conditions. Attachment A, Locations of Baseline Outdoor Ambient Sound Level Survey, includes summarized data collection from the first week of this Survey, a plot plan, and a detailed description of the technical approach to distinguish generally steady Ventura Compressor Station operation noise from the background sound environment and noise from these temporary and intermittent on-site construction activities.

Table 2 shows the range of hourly L_{eq} , L_{max} , L_{min} , L_{10} , L_{50} , and L_{90} values derived from the collected data at both SLM positions during the first 7 sampled days (June 21, 2021, to June 28, 2021). The highest hourly levels in Table 2 reflects the influence of on-site construction activities and other outdoor acoustical contributors (e.g., vehicle traffic on nearby roadways, non-Project commercial and industrial activities) that varied with time of day. The lower values of the ranges reflect periods of normal gas compression system operation and at hours (e.g., evening and nighttime) when construction was not in progress and other background acoustical contributors would be minimized. In other words, the lower values for L_{eq} , L_{50} , and L_{90} shown in Table 2 are likely representative of only existing gas compression system operation noise under current typical and steady-state conditions, and can thus be used in subsequent comparisons with predicted operation noise levels associated with the Project.²

At the northern SLM position, the measured “low” hourly L_{eq} and statistical L_{50} and L_{90} values fall within a narrow 56–57 dBA range over the displayed 7-day period in Table 2. This similarity of noise magnitudes strongly supports a correlation of the measured outdoor sound with steady-state operation of the nearby existing compressor station. At the southern survey position, measured “low” hourly L_{eq} values fall within a 53–54 dBA range over the displayed 7-day period in Table 2.

¹ Documented GPS coordinates for June 23, 2021, at the northern SLM deployment were latitude 34.297927, longitude -119.299038.

² L_{50} and L_{90} are statistical values indicating what dBA was exceeded for 50% and 90% of the measurement period, respectively.

Table 2. Summary of Baseline Outdoor Ambient Sample Sound Levels

Sampling Period End Date	Measured Hourly Levels and Statistical Values (dBA) June 21, 2021, to June 28, 2021											
	Leq		Lmax		Lmin		L10		L50		L90	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Northern Access Gate Sound Level Meter												
06/22/2021	63	56	84	64	56	53	65	56	59	56	57	55
06/23/2021	63	57	85	69	57	54	65	58	61	57	60	56
06/24/2021	64	57	92	69	58	55	66	57	62	57	60	56
06/25/2021	75	57	91	70	62	55	75	57	73	57	71	56
06/26/2021	76	57	90	71	61	53	77	58	75	56	73	56
06/27/2021	71	57	94	70	58	54	69	58	67	57	66	56
06/28/2021	70	57	86	70	65	54	71	57	69	56	68	55
Southwestern Corner Sound Level Meter												
06/22/2021	64	53	82	63	52	48	64	53	60	53	58	51
06/23/2021	64	54	87	65	53	47	64	54	59	53	56	51
06/24/2021	61	54	88	67	53	49	64	55	59	53	57	52
06/25/2021	63	54	88	66	53	48	64	55	59	53	57	51
06/26/2021	66	54	86	68	55	46	68	54	65	52	63	50
06/27/2021	63	54	93	67	52	46	62	54	57	51	55	49
06/28/2021	62	53	82	68	52	45	64	54	59	52	56	50

Notes: dBA = A-weighted decibel; Leq = energy-equivalent sound level; Lmax = maximum measured sound level; Lmin = minimum measured sound level; L10, L50, and L90 are statistical values indicating what dBA was exceeded for a cumulative period of time representing 10%, 50%, and 90% of the measuring period, respectively.

The operation status of the Ventura Compressor Station during the surveyed 7-day period from June 21 to June 28, 2021, was generally two of the three compressor systems activated and operating at nearly full load (on average, 87% of full load). However, the Ventura Compressor Station can and does operate with all three compressor systems active, with each at similar nearly full-load conditions averaging 91%. Under such conditions that would better represent “full load” or maximum operating capacity, and hence the most noise emission due to steady operation of the existing Ventura Compressor Station, the expected noise levels at the baseline noise level monitoring positions would be slightly greater, by approximately 2 decibels (dB). Therefore, for purposes of Project operation noise assessment that uses these greatest potential baseline sound levels, the northern monitoring location Leq value would be 58 dBA (i.e., 56 dBA associated with two operating compressors as shown in Table 2, plus 2 dB for adding the third, equaling 58 dBA). Similarly, the Leq value for assessment at the southern monitoring location would be 55 dBA (the sum of 53 dBA, shown in Table 2, plus 2 dB for the third operating compressor system, equaling 55 dBA).

Anticipated Peak Noise Event

Gas venting events involving release through the emergency shutdown (ESD) system are uncommon but may be necessary for reliable and safe operation of the facility. These venting events are temporary and short-duration noise-producing events and are typically characterized as one of the loudest events at the compressor station.

Planned system testing allows natural gas to be vented into on-site piping that feeds into SoCalGas's local distribution system. However, unplanned venting may occur through the emergency blowdown stack causing noise.

By way of example, on July 2, 2021, at approximately 3:44 p.m., there was an unplanned release through the ESD that lasted about 2 minutes. Sound level meters picked up the sound from the ESD. This on-site noise-producing event measured 63.4 dBA L_{eq} over the 5-minute interval between 3:40 p.m. and 3:45 p.m., and 78 dBA L_{max} during the same interval at the southern SLM position. However, the L_{eq} and L_{max} values for the interval preceding the blowdown were 59.9 dBA and 69.3 dBA, respectively. Hence, while exhibiting a nearly 9 dB louder L_{max} value, the measured interval containing the blowdown event appeared to only cause a 3.4 dB increase in the 5-minute L_{eq} value.

At the northern access gate survey position, where the successive measurement intervals were one-minute in duration, 66.8 dBA L_{eq} and 79.8 dBA L_{max} were recorded during the 3:44 p.m. to 3:45 p.m. interval. Compared to the 62.7 dBA L_{eq} and 68.2 dBA L_{max} values measured in the immediately preceding 3:43 p.m. to 3:44 p.m. interval, the blowdown event caused an L_{max} value that was more than 11 dB greater, but an L_{eq} value that was only 4.1 dB greater during the one-minute interval.

Although these on-site measurements indicate that a venting occurrence could be a loud event compared to normal compressor station operations, the effect of such a relatively short-duration event (i.e., approximately 2 minutes) on the hourly L_{eq} value is minimal and consistent with acoustical principles: the sound energy of the 2-minute venting event is diluted over the entirety of a 60-minute measurement period.

2.3 Regulatory Setting

Federal Regulations and Guidance

There are no noise regulations at the federal level that would apply to the VCS site with regard to environmental noise assessment of its residual operations after a new compressor station site is built (at one of the three considered Site Alternatives, studied under separate cover) and begins operation.

State Guidance

There are no noise regulations at the state level that would apply to the Project with regard to its environmental noise assessment.

Local Regulations and Guidance

CPUC decisions, as well as California courts, have confirmed CPUC's preemptory powers over matters of statewide concern, including utility project siting. General Order 177 was adopted in December 2022, reaffirming preemption of local authority. As such, no local discretionary permits would be required because CPUC has preemptive jurisdiction over the siting, construction, maintenance, and operation of natural gas facilities in California. As discussed in Section 2.2, Environmental Setting, the VCS site is entirely within the City. This "Local" section of the Regulatory Setting identifies City regulations specific to noise for informational purposes and to assist with environmental review, although the Project is not subject to local discretionary permitting..

City of Ventura Municipal Code

Unnecessary, excessive, or annoying noise in Ventura is prohibited by Section 10.650 of the City of Ventura Noise Ordinance (Noise Ordinance; City of Ventura 2025). Exterior noise limits quantified by the Noise Ordinance include the following from Section 10.650.130.B for each of four “noise zones”:

- Noise Zone I (noise-sensitive properties) – 50 dBA (7 a.m.–10 p.m.); 45 dBA (10 p.m.–7 a.m.)
- Noise Zone II (residential properties) – 50 dBA (7 a.m.–10 p.m.); 45 dBA (10 p.m.–7 a.m.)
- Noise Zone III (commercial properties) – 60 dBA (7 a.m.–10 p.m.); 55 dBA (10 p.m.–7 a.m.)
- Noise Zone IV (industrial and agricultural properties) – 70 dBA (anytime)

These noise standards above apply to any noise-generating activity that exceeds the applicable level for a cumulative period of more than 30 minutes in any hour. For noise levels of less duration, Section 10.650.130.B.2 allows dB increments of the threshold, but no more than a 20 dB increase for sound less than a minute within the given hour.

City of Ventura General Plan

Chapter 7 of the City’s 2005 Ventura General Plan describes policies and expected actions with respect to new residential developments and includes consistency with the California Building Code requirement of 45 dBA CNEL for inhabited rooms. However, the Project consists of an upgrade of an existing industrial facility on M-2 zoned land; therefore, there are no General Plan expectations directly applicable to the Project.

2.4 Analyzed Limits

The analysis in this memo is based on the local policies and regulations described in Section 2.3, and are listed below.

- **Project-attributed Stationary Source Noise Emission to the Community:** As received by the nearest off-site noise-sensitive receptors, which are either residences (Noise Zone II) or schools and hospitals (Noise Zone I), the City’s exterior noise level limits of 50 dBA from 7 a.m. to 10 p.m. and 45 dBA from 10 p.m. to 7 a.m. would apply per Section 10.650.130.B of the its noise ordinance.
- **Exposure of Project Workers or Visitors to Excessive Aviation Noise:** Typically, project areas where outdoor workers or visitors may be present that intersects the 65 dBA CNEL aviation noise contour of a public or private airport would be considered a potentially significant noise impact.

3 Approach and Methodology

Prediction of aggregate noise exposure levels at the nearest representative noise-sensitive receiver attributed to normal operation of anticipated VCS site noise-producing stationary sources involves usage of the Datakustik CadnaA (Computer Aided Noise Abatement) sound propagation model. CadnaA is a commercially available software program for the calculation, presentation, assessment, and prediction of environmental noise based on algorithms and reference data per International Organization of Standardization Standard 9613-2, “Attenuation of Sound During Propagation Outdoors, Part 2: General Method of Calculation” (ISO 2024). Expected sources of noise

emission from within the boundary of the VCS site include a variety of on-site electromechanical equipment. These sources are detailed in Attachment B, Operation Noise Prediction Model Inputs, but can be summarized as follows:

- **Standby generator** – 63 dBA at 23 feet;
- **Air compressor** – 68 dBA at 3.28 feet; and
- **Meter run system** – 85 dBA at 3 feet;

Figure 2, Predicted Stationary Source Operation Noise from the Ventura Compressor Station, illustrates (with purple-filled callouts) the approximate geographic on-site locations of these above-listed outdoor sources. In addition to the above-described sound sources, the following assumptions, features, and parameters are included in this CadnaA-supported stationary noise source assessment:

- All noise sources are assumed to operate concurrently and in a steady-state or otherwise continuous manner for a full hour so that the predicted energy-equivalent level (L_{eq}) may be compared directly with an L_{eq} standard value for daytime or nighttime periods. Note that if actual VCS site equipment operation was less than an hour during actual operation, its sound energy would be “diluted” across a full hour of time and result in a lower L_{eq} value. By way of example, and consistent with acoustical principles, if for some reason the Project only operated for half of a full hour, the resulting hourly L_{eq} value would be 3 dB less than that of the L_{eq} representing a full hour of steady-state operation.
- A ground effect acoustical absorption coefficient equal to 0.5 is assumed, which represents a balanced mix of ground types over which Project sound would travel across and beyond the VCS site. Ground types may range from some acoustically absorptive “soft” vegetated ground cover and loose granular aggregate to acoustically “hard” or reflective surfaces such as pavement, hard-packed dirt, or smooth concrete.
- A reflection order of 1 is assumed, which allows for a single reflection of sound paths on encountered structural surfaces such as the new office and warehouse buildings.
- Given the relatively flat terrain of the VCS site and its surroundings, and apart from afore-mentioned ground effect acoustical absorption, the model neglects topographic effects.
- The model includes a representation of existing noise-occluding solid walls and acoustically porous chain-link fencing along current extents of the VCS site boundary.
- Calm meteorological conditions (i.e., no wind) were observed, at 68 degrees Fahrenheit and 50 percent relative humidity.

4 Results

Table 3 tabulates the predicted noise exposure levels attributed to anticipated steady-state operation of the residual VCS site sound-emitting sources at the four nearest off-site receptor positions as shown in Figure 2, Predicted Stationary Source Operation Noise from Ventura Compressor Station. The offsite receptor (OR) positions listed in Table 3 are the same as those tagged in the set of modeled receptors appearing in Table 5.13-6 of the VCS Modernization Project Proponent’s Environmental Assessment (PEA).

Table 3. Predicted Project Operational Noise Levels (All Four Compressors)

Modeled Receptor (Figure 2 tagged)	Hourly L_{eq} (dBA)
OR1 = 186 Forbes Lane (existing single-family home)	33.1

Table 3. Predicted Project Operational Noise Levels (All Four Compressors)

Modeled Receptor (Figure 2 tagged)	Hourly L_{eq} (dBA)
OR2 = E.P. Foster Elementary School western boundary	38.9
OR3 = 181 West McFarlane Drive (existing single-family home)	36.9
OR7 = 1675 N. Olive St. (residence)	35.6

Notes: L_{eq} = energy-equivalent sound level; dBA = A-weighted decibel; OR = off-site receptor.
All listed receptor points are assumed to be 5 feet above local grade.

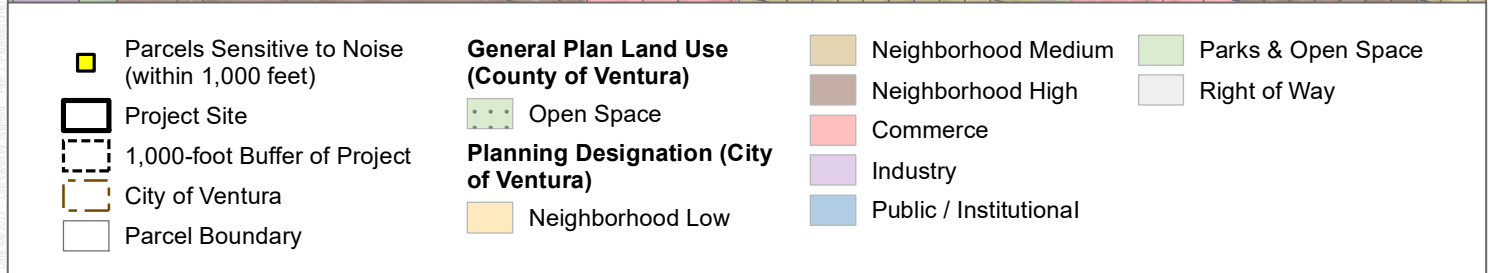
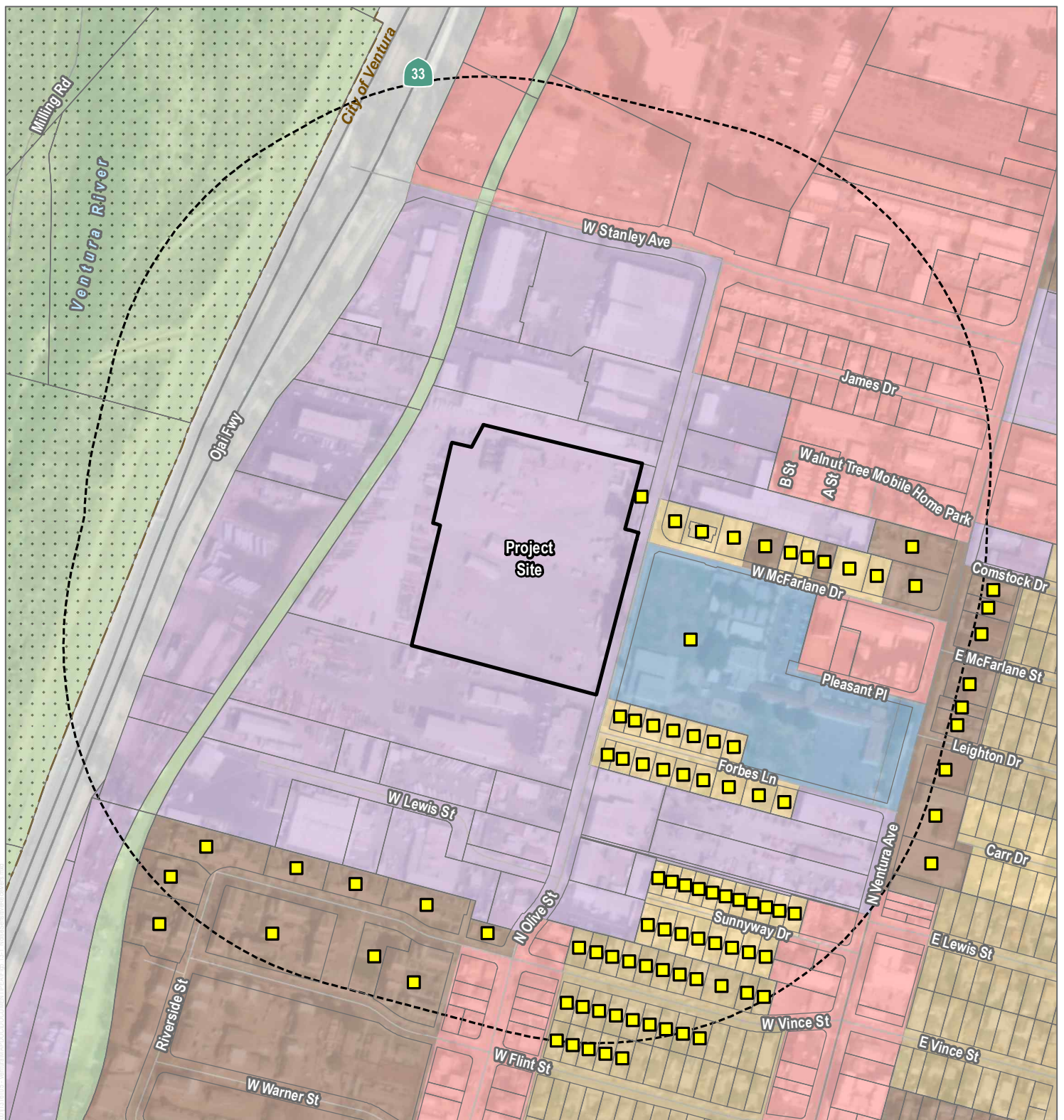
The predicted noise levels appearing in Table 3 are well below 60 dBA and therefore expected to satisfy both daytime and nighttime conditions of City Noise Ordinance Section 10.650.130.B. A color-coded plot of predicted Project operational sound emission appears in Figure 2, Predicted Stationary Source Operation Noise from Ventura Compressor Station.

Compared to the lowest L_{90} sound level, 49 dBA, measured during the 24-hour period on 06/27/2021 at the southern SLM baseline monitoring position and that would contain contribution from steady-state or continuous acoustical sources that may include current VCS operation, the future VCS site operation noise levels in Table 3 are several dB lower and may—under the right conditions—be masked (i.e., rendered indistinct) by other noise components of the outdoor ambient environment.

Given their on-site positions and distances to the nearest off-site sensitive receptors, groundborne vibration attributed to operation of remnant VCS site systems would not propagate substantial groundborne vibration magnitudes beyond the property line. In addition, there are no public airports or private airfields within 2 miles of the Project Site, and the Project Site is distant from a mapped aviation traffic noise contour greater than 65 dBA CNEL associated with public airports in the region.

5 References Cited

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SOURCE: Esri and Digital Globe, Open Street Map

FIGURE 1
Proximity of Noise-Sensitive Receivers within 1,000 Feet of Project Site
Residual Ventura Compressor Station Operations - Noise Technical Memorandum



SOURCE: Dudek 2025

DUDEK



0 101 202 Feet

FIGURE 2
Predicted Stationary Source Operation Noise from Ventura Compressor Station (if Alternative Site selected for Modernization)

SoCal Gas - Ventura Compressor Station Modernization Project - Alternative Sites Studies (13161.08)

Attachment A

Baseline Sound Level Data Collection



SOURCE: Google 2023; Dudek 2023

DUDEK



0 102.5 205 Feet

Attachment A

Locations of Baseline Outdoor Ambient Sound Level Survey

SoCal Gas - Ventura Compressor Station Modernization Project PEA

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
15:40	D9	D9	61	81	53	63	59	57	0 N1
16:40	D10	D10	60	82	55	62	58	57	1 N2
17:40	D11	D11	60	77	55	62	58	57	2 N3
18:40	D12	D12	59	74	53	61	56	55	3 N4
19:40	E1	D13	58	75	54	60	56	56	4 N5
20:40	E2	D14	59	82	55	61	58	57	5 N6
21:40	E3	D15	59	84	55	59	57	56	6 N7
22:40	N8	N8	58	69	55	59	57	56	7 D1
23:40	N9	N9	57	70	56	58	57	56	8 D2
00:40	N1	N1	57	76	55	57	57	56	9 D3
01:40	N2	N2	56	64	54	56	56	55	10 D4
02:40	N3	N3	57	72	55	57	56	56	11 D5
03:40	N4	N4	57	69	55	57	57	56	12 D6
04:40	N5	N5	58	70	55	59	57	56	13 D7
05:40	N6	N6	60	79	55	62	57	57	14 D8
06:40	N7	N7	61	75	56	64	58	57	15 D9
07:40	D1	D1	61	77	56	62	59	57	16 D10
08:40	D2	D2	63	76	56	65	59	57	17 D11
00:00	N1	N1	57	76	56	58	57	56	18 D12
00:00	N1	N1	57	76	56	58	57	56	19 E1
00:00	N1	N1	57	76	56	58	57	56	20 E2
00:00	N1	N1	57	76	56	58	57	56	21 E3
00:00	N1	N1	57	76	56	58	57	56	22 N8
00:00	N1	N1	57	76	56	58	57	56	23 N9
largest			63	84	56	65	59	57	
smallest			56	64	53	56	56	55	
24-hour			59	84	53	60	57	56	
Leq day	D		#N/A						
Leq eve	E		59						
Leq night	N		58						
CNEL			#N/A						
Leq day	D		#N/A						
Leq night	N		58						
LDN			#N/A						

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
10:00	D4	D4	61	83	55	62	58	57	0 N1
11:00	D5	D5	61	77	56	62	59	58	1 N2
12:00	D6	D6	60	75	55	62	58	57	2 N3
13:00	D7	D7	62	84	55	64	60	58	3 N4
14:00	D8	D8	62	85	54	63	59	57	4 N5
15:00	D9	D9	61	76	54	63	58	57	5 N6
16:00	D10	D10	60	77	56	62	59	58	6 N7
17:00	D11	D11	61	77	55	63	59	57	7 D1
18:00	D12	D12	60	76	55	63	58	57	8 D2
19:00	E1	D13	60	77	55	61	58	56	9 D3
20:00	E2	D14	59	70	54	60	57	57	10 D4
21:00	E3	D15	59	76	56	61	58	57	11 D5
22:00	N8	N8	58	73	55	59	57	57	12 D6
23:00	N9	N9	59	83	56	59	57	57	13 D7
00:00	N1	N1	58	69	56	58	57	57	14 D8
01:00	N2	N2	57	71	56	58	57	57	15 D9
02:00	N3	N3	57	70	56	58	57	57	16 D10
03:00	N4	N4	58	78	56	58	57	57	17 D11
04:00	N5	N5	58	72	56	58	57	57	18 D12
05:00	N6	N6	59	72	56	60	58	57	19 E1
06:00	N7	N7	61	73	57	64	59	58	20 E2
07:00	D1	D1	63	76	57	65	61	59	21 E3
08:00	D2	D2	63	79	57	65	61	60	22 N8
00:00	N1	N1	58	69	56	58	57	57	23 N9
		largest	63	85	57	65	61	60	
		smallest	57	69	54	58	57	56	
24-hour			60	85	54	61	58	57	
Leq day	D		#N/A						
Leq eve	E		59						
Leq night	N		59						
CNEL			#N/A						
Leq day	D		#N/A						
Leq night	N		59						
LDN			#N/A						

		LAeq	ASmax	LA5min	LA10	LA50	LA90		
	CNEL	DNL						CNEL	DNL
10:00	D4	D4	62	75	56	64	60	59	0 N1 N1
11:00	D5	D5	63	82	55	64	60	58	1 N2 N2
12:00	D6	D6	61	83	55	62	58	57	2 N3 N3
13:00	D7	D7	64	92	58	65	61	60	3 N4 N4
14:00	D8	D8	63	79	57	65	61	60	4 N5 N5
15:00	D9	D9	62	76	55	64	60	58	5 N6 N6
16:00	D10	D10	64	84	56	66	62	59	6 N7 N7
17:00	D11	D11	63	81	57	65	62	60	7 D1 D1
18:00	D12	D12	63	88	56	65	60	58	8 D2 D2
19:00	E1	D13	61	83	55	63	58	57	9 D3 D3
20:00	E2	D14	59	77	55	61	58	57	10 D4 D4
21:00	E3	D15	59	71	55	60	57	57	11 D5 D5
22:00	N8	N8	58	73	55	59	57	56	12 D6 D6
23:00	N9	N9	58	74	56	59	57	57	13 D7 D7
00:00	N1	N1	57	69	55	58	57	56	14 D8 D8
01:00	N2	N2	57	72	56	57	57	56	15 D9 D9
02:00	N3	N3	57	70	56	57	57	56	16 D10 D10
03:00	N4	N4	57	71	56	57	57	56	17 D11 D11
04:00	N5	N5	57	72	55	58	57	56	18 D12 D12
05:00	N6	N6	59	79	56	60	57	57	19 E1 D13
06:00	N7	N7	62	81	56	64	59	57	20 E2 D14
07:00	D1	D1	62	78	56	64	59	58	21 E3 D15
08:00	D2	D2	64	77	56	65	61	59	22 N8 N8
00:00	N1	N1	57	69	55	58	57	56	23 N9 N9
		largest	64	92	58	66	62	60	
		smallest	57	69	55	57	57	56	
1									
24-hour			61	92	55	62	59	58	
Leq day	D	#N/A							
Leq eve	E	60							
Leq night	N	58							
CNEL		#N/A							
Leq day	D	#N/A							
Leq night	N	58							
LDN		#N/A							

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
09:06	D3	D3	71	84	57	71	69	68	0 N1
10:06	D4	D4	72	85	60	72	70	68	1 N2
11:06	D5	D5	70	87	59	70	68	67	2 N3
12:06	D6	D6	67	86	56	66	63	61	3 N4
13:06	D7	D7	71	91	61	72	69	68	4 N5
14:06	D8	D8	71	82	56	72	69	68	5 N6
15:06	D9	D9	70	85	56	70	67	66	6 N7
16:06	D10	D10	64	76	56	66	61	59	7 D1
17:06	D11	D11	63	77	57	65	62	60	8 D2
18:06	D12	D12	64	83	56	66	62	60	9 D3
19:06	E1	D13	60	76	55	62	57	57	10 D4
20:06	E2	D14	59	72	56	62	57	56	11 D5
21:06	E3	D15	59	75	56	60	58	57	12 D6
22:06	N8	N8	59	73	56	59	57	57	13 D7
23:06	N9	N9	58	77	56	59	57	57	14 D8
00:06	N1	N1	58	80	56	58	57	57	15 D9
01:06	N2	N2	57	70	56	57	57	56	16 D10
02:06	N3	N3	57	71	56	57	57	56	17 D11
03:06	N4	N4	58	72	56	58	57	57	18 D12
04:06	N5	N5	58	71	56	59	57	57	19 E1
05:06	N6	N6	60	78	56	61	58	57	20 E2
06:06	N7	N7	65	77	57	66	62	60	21 E3
07:06	D1	D1	72	86	62	73	70	69	22 N8
08:06	D2	D2	75	89	57	75	73	71	23 N9
		largest	75	91	62	75	73	71	
		smallest	57	70	55	57	57	56	
24-hour			68	91	55	65	62	61	
Leq day	D		71						
Leq eve	E		59						
Leq night	N		60						
CNEL			70						
Leq day	D		70						
Leq night	N		60						
LDN			70						

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
09:11	D3	D3	74	89	58	72	70	68	0 N1
10:11	D4	D4	76	87	61	76	74	72	1 N2
11:11	D5	D5	73	89	57	70	67	65	2 N3
12:11	D6	D6	73	90	56	69	66	65	3 N4
13:11	D7	D7	72	88	55	70	66	64	4 N5
14:11	D8	D8	73	88	57	72	68	67	5 N6
15:11	D9	D9	75	89	59	74	71	70	6 N7
16:11	D10	D10	73	89	56	71	67	66	7 D1
17:11	D11	D11	74	90	57	72	69	68	8 D2
18:11	D12	D12	67	81	55	67	62	60	9 D3
19:11	E1	D13	60	73	55	62	58	57	10 D4
20:11	E2	D14	61	87	56	63	58	57	11 D5
21:11	E3	D15	59	72	56	61	58	57	12 D6
22:11	N8	N8	59	77	55	60	57	56	13 D7
23:11	N9	N9	58	71	56	59	57	56	14 D8
00:11	N1	N1	58	75	54	58	56	56	15 D9
01:11	N2	N2	57	78	53	58	56	56	16 D10
02:11	N3	N3	58	71	56	58	57	57	17 D11
03:11	N4	N4	57	71	56	58	57	56	18 D12
04:11	N5	N5	58	71	56	58	57	57	19 E1
05:11	N6	N6	59	74	56	60	58	57	20 E2
06:11	N7	N7	61	76	56	63	59	58	21 E3
07:11	D1	D1	76	88	59	77	75	73	22 N8
08:11	D2	D2	76	88	57	76	74	73	23 N9
		largest	76	90	61	77	75	73	
		smallest	57	71	53	58	56	56	
24-hour			71	90	53	66	63	62	
Leq day		D	74						
Leq eve		E	60						
Leq night		N	58						
CNEL			72						
Leq day		D	73						
Leq night		N	58						
LDN			72						

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
09:05	D3	D3	71	86	55	69	66	65	0 N1
10:05	D4	D4	65	81	56	66	64	62	1 N2
11:05	D5	D5	64	77	55	65	62	60	2 N3
12:05	D6	D6	61	76	54	63	58	56	3 N4
13:05	D7	D7	66	79	58	68	64	62	4 N5
14:05	D8	D8	64	78	55	66	63	61	5 N6
15:05	D9	D9	62	83	54	63	59	58	6 N7
16:05	D10	D10	61	78	55	63	59	58	7 D1
17:05	D11	D11	64	75	54	65	62	60	8 D2
18:05	D12	D12	62	83	54	64	59	57	9 D3
19:05	E1	D13	59	75	54	61	57	56	10 D4
20:05	E2	D14	59	78	55	61	57	56	11 D5
21:05	E3	D15	64	94	56	61	58	57	12 D6
22:05	N8	N8	59	73	56	61	58	57	13 D7
23:05	N9	N9	58	71	55	59	57	57	14 D8
00:05	N1	N1	58	76	55	58	57	56	15 D9
01:05	N2	N2	57	70	55	58	57	56	16 D10
02:05	N3	N3	57	71	56	58	57	57	17 D11
03:05	N4	N4	57	70	56	58	57	57	18 D12
04:05	N5	N5	57	72	56	58	57	57	19 E1
05:05	N6	N6	58	71	56	59	57	57	20 E2
06:05	N7	N7	59	78	56	60	58	57	21 E3
07:05	D1	D1	65	82	57	66	63	61	22 N8
08:05	D2	D2	70	88	57	69	67	66	23 N9
		largest	71	94	58	69	67	66	
		smallest	57	70	54	58	57	56	
24-hour			64	94	54	62	60	59	
Leq day	D		66						
Leq eve	E		61						
Leq night	N		58						
CNEL			67						
Leq day	D		65						
Leq night	N		58						
LDN			67						

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
14:45	D8	D8	61	80	51	62	58	55	0 N1
15:45	D9	D9	58	79	48	61	56	53	1 N2
16:45	D10	D10	58	82	50	60	55	53	2 N3
17:45	D11	D11	57	69	50	60	54	52	3 N4
18:45	D12	D12	57	79	49	59	53	51	4 N5
19:45	E1	D13	56	70	50	58	53	52	5 N6
20:45	E2	D14	57	82	51	59	53	52	6 N7
21:45	E3	D15	56	75	51	58	53	53	7 D1
22:45	N8	N8	54	69	51	56	53	52	8 D2
23:45	N9	N9	55	75	52	56	54	53	9 D3
00:45	N1	N1	54	66	52	54	53	53	10 D4
01:45	N2	N2	53	63	50	53	53	52	11 D5
02:45	N3	N3	54	75	51	55	53	53	12 D6
03:45	N4	N4	54	67	52	55	53	53	13 D7
04:45	N5	N5	56	69	52	57	54	53	14 D8
05:45	N6	N6	58	69	52	61	56	54	15 D9
06:45	N7	N7	60	80	52	63	57	55	16 D10
07:45	D1	D1	59	71	51	61	56	54	17 D11
08:45	D2	D2	58	75	50	61	54	52	18 D12
09:45	D3	D3	60	79	49	61	55	53	19 E1
10:45	D4	D4	64	80	51	64	60	58	20 E2
11:45	D5	D5	59	81	49	61	55	52	21 E3
12:45	D6	D6	60	79	49	62	55	53	22 N8
13:45	D7	D7	60	78	49	62	57	54	23 N9
largest			64	82	52	64	60	58	
smallest			53	63	48	53	53	51	
24-hour			58	82	48	59	55	53	
Leq day	D		60						
Leq eve	E		56						
Leq night	N		56						
CNEL			63						
Leq day	D		59						
Leq night	N		56						
LDN			63						

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL								
16:52	D10	D10	58	71	50	61	56	53	0 N1 N1
17:52	D11	D11	59	78	49	62	56	52	1 N2 N2
18:52	D12	D12	58	72	50	61	55	53	2 N3 N3
19:52	E1	D13	56	72	48	58	53	52	3 N4 N4
20:52	E2	D14	56	69	51	58	53	53	4 N5 N5
21:52	E3	D15	55	68	51	57	53	53	5 N6 N6
22:52	N8	N8	55	77	52	56	54	53	6 N7 N7
23:52	N9	N9	54	66	52	55	54	54	7 D1 D1
00:52	N1	N1	56	70	52	56	55	55	8 D2 D2
01:52	N2	N2	54	65	52	54	54	53	9 D3 D3
02:52	N3	N3	55	72	52	55	54	54	10 D4 D4
03:52	N4	N4	55	73	52	56	53	53	11 D5 D5
04:52	N5	N5	56	70	52	58	54	54	12 D6 D6
05:52	N6	N6	61	82	53	62	57	55	13 D7 D7
06:52	N7	N7	60	77	52	63	57	55	14 D8 D8
07:52	D1	D1	59	76	49	61	56	53	15 D9 D9
08:52	D2	D2	57	73	48	59	54	51	16 D10 D10
09:52	D3	D3	57	78	48	60	54	51	17 D11 D11
10:52	D4	D4	59	80	47	61	54	51	18 D12 D12
11:52	D5	D5	57	70	48	60	55	52	19 E1 D13
12:52	D6	D6	62	78	51	63	59	56	20 E2 D14
13:52	D7	D7	59	74	53	61	58	56	21 E3 D15
14:52	D8	D8	60	73	50	62	58	55	22 N8 N8
15:52	D9	D9	64	87	50	64	59	56	23 N9 N9
largest			64	87	53	64	59	56	
smallest			54	65	47	54	53	51	
24-hour			58	87	47	59	55	53	
Leq day	D		60						
Leq eve	E		56						
Leq night	N		57						
CNEL			64						
Leq day	D		59						
Leq night	N		57						
LDN			64						

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL							CNEL	DNL
17:37	D11	D11	61	88	52	62	58	56	0 N1
18:37	D12	D12	58	75	51	61	56	54	1 N2
19:37	E1	D13	57	74	52	60	55	53	2 N3
20:37	E2	D14	56	69	50	58	53	52	3 N4
21:37	E3	D15	56	77	50	57	53	52	4 N5
22:37	N8	N8	55	67	51	57	54	53	5 N6
23:37	N9	N9	56	75	52	56	54	54	6 N7
00:37	N1	N1	55	69	53	56	55	54	7 D1
01:37	N2	N2	55	67	52	55	54	54	8 D2
02:37	N3	N3	55	73	52	55	54	53	9 D3
03:37	N4	N4	54	73	51	55	53	52	10 D4
04:37	N5	N5	56	77	52	57	53	53	11 D5
05:37	N6	N6	58	71	52	61	56	54	12 D6
06:37	N7	N7	61	82	52	64	58	55	13 D7
07:37	D1	D1	61	77	51	63	57	54	14 D8
08:37	D2	D2	60	72	51	62	58	56	15 D9
09:37	D3	D3	61	75	51	63	58	56	16 D10
10:37	D4	D4	60	78	52	62	58	55	17 D11
11:37	D5	D5	58	72	50	60	56	53	18 D12
12:37	D6	D6	60	75	50	62	57	55	19 E1
13:37	D7	D7	60	83	50	62	57	54	20 E2
14:37	D8	D8	60	79	49	62	57	54	21 E3
15:37	D9	D9	61	73	52	63	59	57	22 N8
16:37	D10	D10	59	68	51	62	58	55	23 N9
largest			61	88	53	64	59	57	
smallest			54	67	49	55	53	52	
24-hour			59	88	49	60	56	54	
Leq day	D		60						
Leq eve	E		56						
Leq night	N		57						
CNEL			64						
Leq day	D		59						
Leq night	N		57						
LDN			64						

		LAeq	ASmax	LA5min	LA10	LA50	LA90			
CNEL	DNL							CNEL	DNL	
17:09	D11	D11	60	75	53	62	59	57	0 N1	N1
18:15	D12	D12	63	82	52	64	59	57	1 N2	N2
19:15	E1	D13	57	76	48	60	54	52	2 N3	N3
20:15	E2	D14	56	70	49	59	53	51	3 N4	N4
21:15	E3	D15	56	71	50	58	53	52	4 N5	N5
22:15	N8	N8	56	72	50	57	53	53	5 N6	N6
23:15	N9	N9	59	88	53	57	54	54	6 N7	N7
00:15	N1	N1	55	70	52	56	54	54	7 D1	D1
01:15	N2	N2	54	66	52	55	54	54	8 D2	D2
02:15	N3	N3	54	74	52	55	54	53	9 D3	D3
03:15	N4	N4	56	74	52	57	55	55	10 D4	D4
04:15	N5	N5	56	71	52	57	55	54	11 D5	D5
05:15	N6	N6	61	88	53	61	56	55	12 D6	D6
06:15	N7	N7	61	82	52	63	58	56	13 D7	D7
07:15	D1	D1	60	73	49	62	58	55	14 D8	D8
08:15	D2	D2	61	72	53	63	59	57	15 D9	D9
09:15	D3	D3	59	73	49	60	56	54	16 D10	D10
10:15	D4	D4	58	73	48	61	56	53	17 D11	D11
11:15	D5	D5	58	69	50	60	56	53	18 D12	D12
12:15	D6	D6	61	80	50	62	58	56	19 E1	D13
13:15	D7	D7	59	75	48	61	56	52	20 E2	D14
14:15	D8	D8	61	78	49	62	58	55	21 E3	D15
15:15	D9	D9	61	81	52	64	59	56	22 N8	N8
16:15	D10	D10	59	71	50	62	57	54	23 N9	N9
		largest	63	88	53	64	59	57		
		smallest	54	66	48	55	53	51		
24-hour			59	88	48	60	56	54		
Leq day	D		60							
Leq eve	E		56							
Leq night	N		58							
CNEL			65							
Leq day		D	60							
Leq night		N	58							
LDN			64							

		LAeq	ASmax	LASmin	LA10	LA50	LA90			
	CNEL	DNL						CNEL	DNL	
16:58	D10	D10	59	76	49	61	56	54	0 N1	N1
17:58	D11	D11	58	73	48	61	55	52	1 N2	N2
18:58	D12	D12	56	74	47	59	53	50	2 N3	N3
19:58	E1	D13	56	71	49	59	53	51	3 N4	N4
20:58	E2	D14	56	75	50	59	53	51	4 N5	N5
21:58	E3	D15	56	79	51	58	54	53	5 N6	N6
22:58	N8	N8	55	70	51	56	53	53	6 N7	N7
23:58	N9	N9	55	71	51	57	54	53	7 D1	D1
00:58	N1	N1	54	72	48	55	52	51	8 D2	D2
01:58	N2	N2	54	68	49	55	53	52	9 D3	D3
02:58	N3	N3	54	69	51	54	53	52	10 D4	D4
03:58	N4	N4	55	74	52	55	53	53	11 D5	D5
04:58	N5	N5	57	77	52	58	54	53	12 D6	D6
05:58	N6	N6	61	86	52	61	56	55	13 D7	D7
07:01	D1	D1	66	76	55	68	65	63	14 D8	D8
08:01	D2	D2	64	78	55	65	62	60	15 D9	D9
09:01	D3	D3	58	81	46	60	54	52	16 D10	D10
10:01	D4	D4	58	76	48	60	55	52	17 D11	D11
11:01	D5	D5	56	69	48	59	53	51	18 D12	D12
12:01	D6	D6	57	73	47	60	54	51	19 E1	D13
13:01	D7	D7	58	72	49	61	56	53	20 E2	D14
14:01	D8	D8	58	77	49	60	54	52	21 E3	D15
15:01	D9	D9	57	75	46	60	53	50	22 N8	N8
16:01	D10	D10	57	74	47	60	54	51	23 N9	N9
			largest	66	86	55	68	65	63	
			smallest	54	68	46	54	52	50	
24-hour			59	86	46	59	55	53		
Leq day	D		60							
Leq eve	E		56							
Leq night	N		#N/A							
CNEL			#N/A							
Leq day	D		59							
Leq night	N		#N/A							
LDN			#N/A							

		LAeq	ASmax	LASmin	LA10	LA50	LA90		
CNEL	DNL								
16:56	D10	D10	57	69	47	60	54	51	0 N1 N1
17:56	D11	D11	58	72	47	61	55	52	1 N2 N2
18:56	D12	D12	56	79	47	59	51	49	2 N3 N3
19:56	E1	D13	57	76	47	60	53	50	3 N4 N4
20:56	E2	D14	63	93	49	59	53	52	4 N5 N5
21:56	E3	D15	57	76	51	59	54	53	5 N6 N6
22:56	N8	N8	55	69	51	57	53	52	6 N7 N7
23:56	N9	N9	57	85	52	57	54	53	7 D1 D1
00:56	N1	N1	55	73	51	55	53	53	8 D2 D2
01:56	N2	N2	54	70	52	55	53	53	9 D3 D3
02:56	N3	N3	54	67	51	54	53	53	10 D4 D4
03:56	N4	N4	54	70	52	54	53	53	11 D5 D5
04:56	N5	N5	55	72	51	56	53	53	12 D6 D6
05:56	N6	N6	56	69	51	57	54	53	13 D7 D7
06:56	N7	N7	61	79	52	62	57	55	14 D8 D8
07:56	D1	D1	60	77	48	61	56	54	15 D9 D9
08:56	D2	D2	58	75	46	60	55	52	16 D10 D10
09:56	D3	D3	57	73	46	59	53	51	17 D11 D11
10:56	D4	D4	58	75	48	60	55	52	18 D12 D12
11:56	D5	D5	57	73	49	60	55	52	19 E1 D13
12:56	D6	D6	57	72	49	60	54	52	20 E2 D14
13:56	D7	D7	58	75	49	60	55	52	21 E3 D15
14:56	D8	D8	58	77	46	60	54	51	22 N8 N8
15:56	D9	D9	59	82	46	61	55	52	23 N9 N9
largest			63	93	52	62	57	55	
smallest			54	67	46	54	51	49	
24-hour			58	93	46	59	54	52	
Leq day	D		58						
Leq eve	E		60						
Leq night	N		56						
CNEL			64						
Leq day	D		58						
Leq night	N		56						
LDN			63						

MEMORANDUM

SUBJECT: VENTURA COMPRESSOR STATION MODERNIZATION PROJECT – ATTACHMENT A, RESIDUAL VENTURA COMPRESSOR STATION OPERATIONS

Baseline Noise Level Methodology

Outdoor Ambient Sound Level Survey

Outdoor ambient sound pressure levels (SPL) were collected at successive one-minute intervals with a deployed stationary American National Standards Institute (ANSI) Type 2 sound level meter (SLM) at each of two Ventura Compressor Station (VCS) onsite locations as depicted in Figure M-1. The SLM at the northern monitoring location (NML) was a SoftdB “Piccolo II” model integrating SLM (with last four digits of serial number [SN] = 2101); and, the SLM at the southern monitoring location (SML) was also a Piccolo II model (SN=2203). Exhibit M-5.1 displays a sample photograph of the SLM deployed at the NML position.



Exhibit 1 – Sample photograph, looking north, of the deployed sound level meter (encircled with yellow dashes) at the northern monitoring location (NML) onsite near the Ventura Compressor Station (VCS) access gate during the June 2021 field survey

The collection of SPL data, with its corresponding acoustical metrics (e.g., L_{eq} , L_{max} , L_{min}) and statistical values (e.g., L_{10} , L_{50} , L_{90} , etc.), was performed at one-minute intervals to help provide analysis granularity and help

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identify particular noise-producing events, such as distinguishing a short-duration onsite operational valve blowdown from onsite construction activities. Values from these intervals were then mathematically consolidated to arrive at hourly values as depicted in the summarized data tables appearing in this Appendix M. These tables present the hourly results (the aforementioned three acoustical metrics and three statistical values) of the identified 24-hour period that was monitored, as well as largest and smallest values of each.

Because onsite construction activity did not occur during nighttime hours, the smallest hourly L_{eq} value over the course of a monitored 24-hour period, typically occurring a nighttime hour (i.e., associated with a timeframe tagged as one of the nine nighttime hours “N1” through “N9” in the summary table), would identify a period of time during which generally steady-state or continuous operation noise from the Ventura Compressor Station compressor systems would be—in the absence of construction noise and roadway traffic noise that reflects heavier volumes during daytime hours—the dominant contributor to the measurable outdoor ambient sound environment. Such L_{eq} values during these nighttime hours are also, within 3 dB or less and as shown in Table 5.13-1 of the PEA, very comparable to the “low” L_{90} values, which further supports that these low L_{eq} values during these nighttime periods indeed represent operating VCS compressor systems. In other words, small differences between L_{eq} and L_{90} values mean that measured noise varies only slightly over a period of time, which is characteristic of a steady-state or continuously operating electro-mechanical equipment such as the compressors.

Correction to Full Load Operations

Compressor load data was provided by SoCal Gas at hourly intervals for each of the three operating compressors during the June 21, 2021 through June 28, 2021 baseline outdoor ambient sound level survey. During this period, only up to two of the three compressors were active at any one time during the 192 successive hours and each active compressor operated at a load averaging at 87%. Aside from only two hours on June 24th (12 noon to 2 p.m.) when just one compressor was active, and thirteen hours on June 28th (11 a.m. to 12 a.m.) when no compressors were active, two compressors were active and operating at these 87% average loads for a total of 177 hours (or 92% of the survey period).

SoCal Gas also provided data for a more recent operation period, two years after that of the preceding survey: June 21, 2023 to June 28, 2023. During this later time, it was documented that up to all three compressors were operating and each at a load averaging 91%. Aside from nine hours when only two compressors were active, three hours when just one compressor was active, and three hours when no compressors were active, three compressors were active and operating at these 91% average loads for a total of 177 hours (or 92% of the survey period).

The preceding subsection has established that low measured L_{eq} values during nighttime hours that are comparable to statistically low L_{90} values from the outdoor ambient sound level survey measurement data represent existing VCS operations noise. Therefore, since compressor activity logs during the survey period indicate that only two of three VCS compressors were operating at nearly full load, then one would reasonably expect that operation of all three VCS compressors at similar load conditions would result in higher L_{eq} values at the survey locations and offsite as sound propagates beyond the VCS boundary into the surrounding commercial and residential neighborhoods. This higher L_{eq} value can be reasonably estimated based on the following acoustical principles and mathematical derivation:

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- Operation noise generated by a VCS compressor includes not only the compressor machinery housed within the existing station building but associated indoor and outdoor acoustical contributors such as air intakes, exhausts, and so on that in aggregate represents a noise-producing system. The aggregate noise level from such an operating compressor system would thus depend on its load conditions, resulting in some net sound level “X” dBA associated with that load condition.
- If there are two operating compressor systems sharing the same equipment and other features, and are operating under comparable load conditions, then one can reasonably conclude that each system would yield X dBA. In acoustical combination and with respect to a receiver position in the same direction and distance from these two sound-emitting systems, the result would be X+3 dBA on the basis of logarithmically adding two identical sound sources: $X+10*\text{LOG}(2)$.
- Since the L_{eq} values represent the noise level of two VCS compressors operating at nearly full load conditions and thus with a net noise level of X+3 dBA, one can estimate the effect of logarithmically adding noise of a third compressor system, which has the same features as the other two and operating at comparable load conditions, with the following expressions:
 - Noise level from two compressors = $X+10*\text{LOG}(2) = X+3$
 - Noise level from three compressors = $X+10*\text{LOG}(3) = X+4.8$
 - The dB difference between three operating compressors and two operating compressors is thus $4.8-3 = 1.8$ dB.

Hence, to accurately estimate the L_{eq} value for three operating existing VCS compressor systems, and thus better represent “full load” operating conditions from the facility, one adds 1.8 dB to the empirically based result for two operating systems. This upward adjustment is reflected in PEA Section 5.13 and informs the noise assessment.

Attachment B

Operation Noise Prediction Model Inputs

Ventura Compressor Station Modernization Project

Residual Ventura Compressor Station Operations – Noise Technical Memorandum

Attachment B -- Operation Noise Prediction Model Inputs

Point Sources

Name	Sel.	M.	ID	Result: PWL			Lw / Li Type	Value	norm. dB(A)	Correction			Sound Reduction R	Area (ft²)	Attenuatio Operating Time			K0 (dB)	Freq. (Hz)	Direct. (none)	Height (ft)	Coordinates		
				Day (dBA)	Evening (dBA)	Night (dBA)				Day dB(A)	Evening dB(A)	Night dB(A)			Day (min)	Special (min)	Night (min)					X (ft)	Y (ft)	Z (ft)
Standby Generator (63 dBA at 23ft)			SG	89.1	89.1	89.1	SET											0		(none)	6	1316.47	848.82	6
Air Compressor (68 dBA at 1m)			AC	76	76	76	SET											0		(none)	5	1129.76	1115.84	5
Meter Run System (85 dBA at 3ft)			MRS	93	93	93	SET											0		(none)	4	1266.4	1138.79	4

Barriers

Name	Sel.	M.	ID	Absorption		Z-Ext. (ft)	Cantilever horz. (ft)	vert. (ft)	Height Begin (ft)	End (ft)
				left	right					
existing north wall 10ft			ENW10	0.1	0.1				10	r
existing north wall 8ft			ENW8	0.1	0.1				8	r
existing east wall 12ft			EEW12						12	r
existing east wall 8ft north leg			EEW8NL						8	r
existing east wall 8ft central leg			EEW8CL						8	r
existing east wall 8ft south leg			EEW8SL						8	r