Padre Associates Carpinteria Noise Management Plan

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Prepared for:

Padre Associates
1861 Knoll Drive
Ventura, CA 93003

Prepared by:

Behrens and Associates, Inc.
13806 Inglewood Avenue
Hawthorne California, 90250

Carol Colby
Acoustical Engineer

Jason Peetz
Engineering Manager

1. Introduction

1.1 Purpose and Scope

The purpose of this study is to assess potential noise impacts associated with the demolition and remediation of the Carpinteria Oil and Gas Processing Facilities. The plant is located at 5675 and 5663 Carpinteria Avenue in Carpinteria, California. The assessment was conducted to evaluate whether the predicted noise levels of the demolition activities will impact the adjacent properties and provide mitigation recommendations, if necessary, to reduce demolition noise levels at the surrounding properties.

The following is provided in this report:

- A brief description of noise fundamentals
- A description of the project noise standards
- Documentation of measured ambient noise levels in the project area
- An analysis of the potential noise impacts of the demolition activities associated with the decommissioning of the Carpinteria Plant.

Figure 1-1 shows the project site.

Figure 1-1 Carpinteria Plant Project Site

2. Noise Fundamentals

Sound is most commonly experienced by people as pressure waves passing through air. These rapid fluctuations in air pressure are processed by the human auditory system to produce the sensation of sound. The rate at which sound pressure changes occur is called the frequency. Frequency is usually measured as the number of oscillations per second or Hertz (Hz). Frequencies that can be heard by a healthy human ear range from approximately 20 Hz to 20,000 Hz. Toward the lower end of this range are low-pitched sounds, including those that might be described as a "rumble" or "boom". At the higher end of the range are high-pitched sounds that might be described as a "screech" or "hiss".

Environmental noise generally derives, in part, from a combination of distant noise sources. Such sources may include common experiences such as distant traffic, wind in trees, and distant industrial or farming activities. These distant sources create a low-level "background noise" in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment, but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle.

Superimposed on this low-level, slowly varying background noise is a succession of identifiable noisy events of relatively brief duration. These events may include the passing of single-vehicles, aircraft flyovers, screeching of brakes, and other short-term events. The presence of these short-term events causes the noise level to fluctuate. Typical indoor and outdoor A-weighted sound levels are shown in Figure 2-1. Detailed acoustical definitions have been provided in Appendix A.

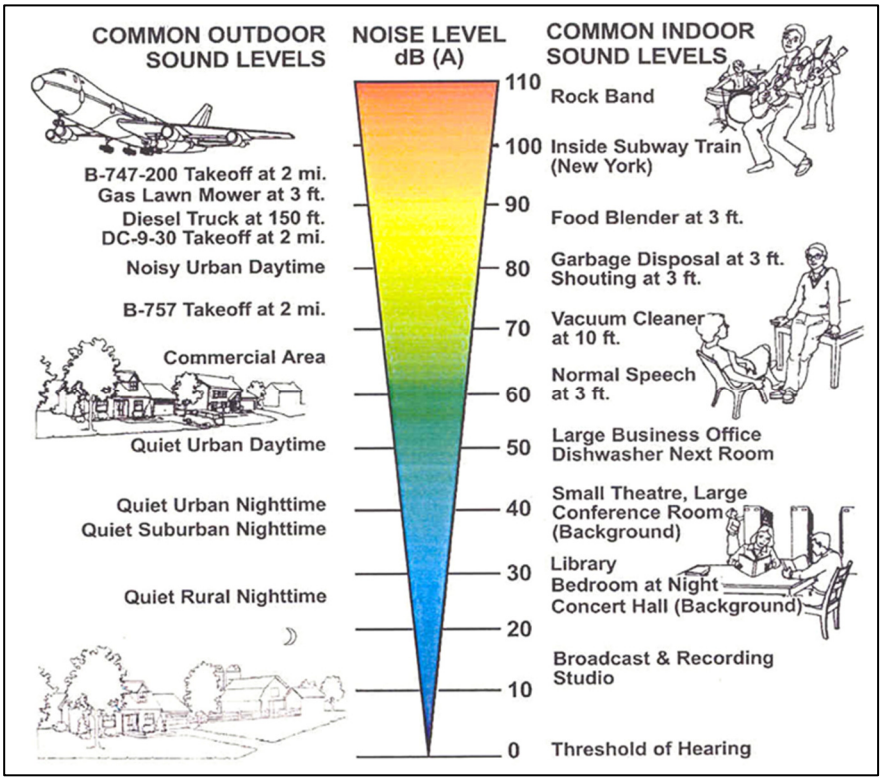


Figure 2-1 Typical Indoor and Outdoor A-Weighted Sound Levels

3. Noise Standards

The City of Carpinteria has "Environmental Review Guidelines" for "Temporary Construction Noise" that states:

> "Temporary construction noise which exceeds 75 dB(A) CNEL for 12 hours within a 24-hour period at residences would be considered significant. Additionally, where temporary construction noise would substantially interfere with normal business communication, or affect sensitive receptors, such as day care facilities, hospitals or schools, temporary impacts would be considered significant.
>
> For the noise level analysis, an increase in noise would be considered significant if any of the following conditions occurred for an extended period of time:
>
> - An increase in noise levels of 10 dB(A) if the existing noise levels are below 55 dB(A) (creates a potential significant nuisance effect);
> - An increase in noise levels that exceeds noise level standards if the existing noise levels are between 55 and 60 dB(A) (Violates existing regulatory requirement); or
> - An increase in noise levels of 5 dB(A) if the existing noise levels are above 60 dB(A) (violates or worsens a violation of an existing regulatory requirement).
>
> …Project noise impacts are significant if they raise existing (ambient) levels from below to above the applicable criterion or if noise resulting from the project increases average ambient levels which are already above the applicable criterion or if noise resulting from the project increases average ambient levels which are already above the applicable criterion by more than three dB, or if project-generated noise results in a five dB increase and the resulting level remains below the maximum considered normally acceptable. These criteria for significance recognize (1) the threshold levels of acceptability established by the local government agencies; (2) that once the threshold level has been passed, any noticeable change above that level (a three dB increase) results in a further degradation of the noise environment; and (3) that a clearly noticeable change (a five dB increase) in the noise environment, even though the threshold has been reached, is also a significant impact, because people respond to changes in noise level regardless of the absolute level of the noise."

The noise level assessment of the proposed demolition activities will be evaluated using the increase in noise level thresholds detailed in the "Environmental Review Guidelines" along with the City of Carpinteria Code of Ordinance and General Plan as defined below.

The City of Carpinteria Code of Ordinances and General Plan define acceptable noise levels for noise impact assessment of the project activities.

Noise Section 14.20.110 of the Code of Ordinances states:

> "The noise level emanating from any commercial use or operation shall not exceed five (5) decibels above the ambient level of the area."

This section of the Code of Ordinances does not mention construction operations specifically, but it can be used as a guideline to assess the impact of demolition activities on the surrounding properties along with the City of Carpinteria "Environmental Review Guidelines" for "Temporary Construction Noise".

The City of Carpinteria General Plan Noise Element provides a "Noise Compatibility Matrix" developed to reduce high levels of noise exposure created by roadway traffic, industrial and commercial activities. These guidelines are divided into "normally acceptable", "conditionally acceptable", "normally unacceptable", and "clearly unacceptable" categories. The upper range of the normally acceptable noise levels shown in in Figure N-3 of the "City of Carpinteria Land Use/Noise Compatibility Matrix" of the general plan are summarized in Table 3-1. The exhibit limits noise levels in terms of Ldn or CNEL. The CNEL limits will be used for this project for a more conservative assessment.

Table 3-1 Community Noise Exposure Guidelines

Land Use Category	Normally Acceptable Community Noise Exposure, dBA CNEL
Residential – Low Density Single Family, Duplex, Mobile Homes	55
Residential – Multi-Family	60
Transient Lodging – Motels, Hotels	65
Schools, Libraries, Churches, Hospitals, Nursing Homes	70
Playgrounds, Neighborhood Parks, open space/walking	70
Golf Courses, Riding Stables, Water Recreation, Cemeteries	75
Office Buildings, Business Commercial And Professional	70
Industrial, Manufacturing, Utilities, Agriculture	75

The community noise exposure guidelines contained in the City of Carpinteria General Plan are guidelines for new developments and should not be considered strict limits for temporary construction projects. With this in mind, the published guidelines will be used to assess the noise impact of the demolition activities on the surrounding properties.

The Carpinteria Plant location is zoned in an industrial land use category; however, it is surround by residential single-family, commercial, and open space/walking trail land use categories. The proposed demolition activities of the decommissioning of the Carpinteria Plant will occur strictly between the daytime hours of 7:00am to 5:00pm. Figure 3-1 shows the zoning map of the Carpinteria Plant and adjacent properties.

Figure 3-1 Zoning Map

Utilizing the City of Carpinteria Code of Ordinances, General Plan and "Environmental Review Guidelines" for "Temporary Construction Noise" "normally acceptable" noise levels, a CNEL noise impact assessment was conducted. The CNEL acceptable noise levels as shown Table 3-1 for the "normally acceptable" community noise exposure were utilized along with the City of Carpinteria Code of Ordinances five decibels above ambient level limit. Throughout this assessment, the noise levels are predicted at a point on the nearest bordering property line, nearest the demolition activity location.

4. Ambient Sound Level Survey

4.1 Ambient Survey Procedure

Three Type 1 sound level meters were deployed nearby the site to conduct the ambient sound level survey. The sound level meters conform to Type 1 as per ANSI S1.4 Specifications for Sound Level Meters. The microphones associated with the sound level meters were placed approximately 5 feet above the ground and at least 10 feet from any reflective surfaces at the location shown in Figure 4-1. The measurement procedure was conducted in compliance with International Standard ISO 1996-2 *Acoustics- Description, measurement and assessment of environmental noise*. The sound level meters were calibrated before and after the measurement period. The instrumentation details are presented in Table 4-1.

Measurement Locations 1 through 3 were positioned on the north, west and south property boundaries of Carpinteria Plant site to document the ambient noise levels near the adjacent noise sensitive properties as shown in Figure 4-1.

Table 4-1 Instrumentation Details

Location	Instrumentation	Manufacturer/Model	Serial Number
1	Sound Level Meter	SVANTEK SVAN 971 Sound Level Meter	56971
2	Sound Level Meter	SVANTEK SVAN 971 Sound Level Meter	74351
3	Sound Level Meter	SVANTEK SVAN 971 Sound Level Meter	40386

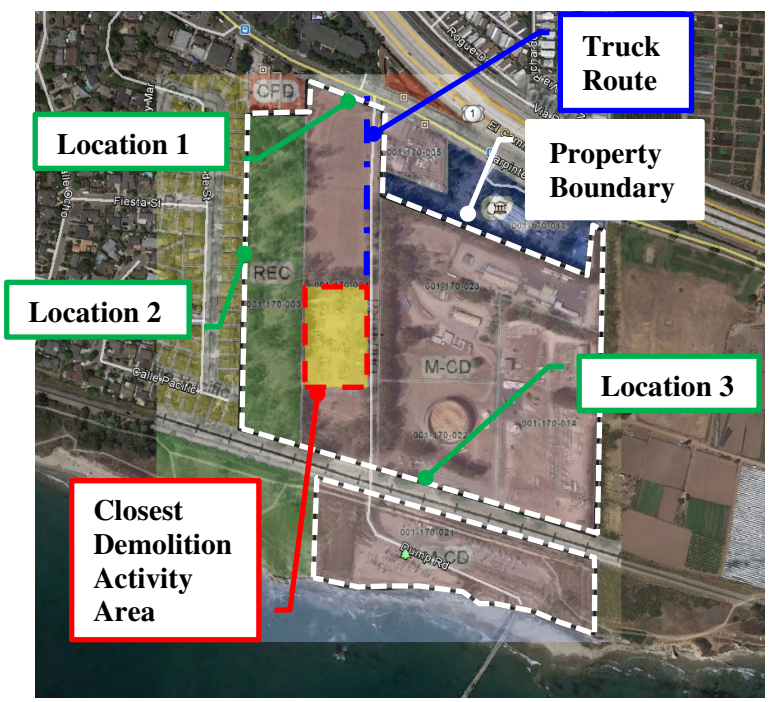


Figure 4-1 Noise Monitoring Locations

The sound level meters were deployed on Wednesday April 7, 2021 and programmed to continuously monitor and record sound levels utilizing the A-weighted decibel scale (dBA). The sound level meters were retrieved on Friday April 9, 2021. Table 4-2 shows the daytime, evening, nighttime and CNEL sound levels for April 8, 2021. Appendix C shows the tabulated measured sound levels.

Table 4-2 Measured Average CNEL Sound Levels (April 8, 2021)

Location	Land Use Category	Daytime	Evening	Nighttime	CNEL, (dBA)
1	Commercial (70 dBA CNEL)	65.3	61.3	61.1	68.5
2	Single Family Residential (55 dBA CNEL)	54.7	55.9	53.3	60.4
3	Coastal Industrial (75 dBA CNEL)	65.9	68.6	54.6	67.7

The measured ambient CNEL sound levels at Location 1 and Location 3 are below the "normally acceptable" community noise exposure sound level of 70 CNEL for commercial and 75 CNEL for coastal industrial, respectively. The measured ambient CNEL sound level at Location 2 is above the "normally acceptable" community noise exposure sound level of 55 CNEL for single-family residential. Therefore, the City of Carpinteria Code of Ordinances and City of Carpinteria "Environmental Review Guidelines" for "Temporary Construction Noise" allowable (5) decibels above ambient level have been utilized for the noise impact assessment.

The weather conditions were captured by a nearby weather station (KCACARPI39) as reported by www.wunderground.com. The weather station is located approximately 0.75 miles northwest of the Carpinteria Plant. The recorded temperatures for the weather station ranged between 48.0 degrees and 73.2 degrees Fahrenheit during the measurement period. Wind speeds ranges between 0 mph and 7.4 mph.

The recorded temperature, wind speed, wind direction, and pressure are displayed graphicly in Appendix B.

5. Carpinteria Plant Demolition Activities Noise Modeling

5.1 Methodology

To predict the noise levels generated by planned demolition activities at the site, noise models were developed with the use of three-dimensional computer noise modeling software. All models in this report were developed with SoundPLAN 8.0 software using the ISO 9613-2 standard. Noise levels are predicted based on the locations, noise levels and frequency spectra of the noise sources, and the geometry and reflective properties of the local terrain, buildings and barriers. To ensure a conservative assessment, the ISO 9613-2 standard assumes light to moderate winds are blowing from the source to receptor.

The demolition activities were modeled for the Carpinteria Plant utilizing the equipment list and layout provided by Padre Associates. The source sound level data used in the modeling is shown in Table 5-1. The sound pressure level at 50 feet and usage factors published in the U.S. Department of Transportation Federal Highway Administration Construction Noise Handbook were used as an input for the demolition noise model. The modeled demolition scenario represents a peak day of demolition activities which accounts for a worst-case scenario in noise impact.

There will also be trucks hauling material from the site. Padre Associates approximates 36 trucks will be coming in and out of the site daily and be limited to the hours between 9am to 4pm, to avoid peak traffic hours. The 36 trucks traveling per day represent the maximum number of trucks on a peak day and not an average number of trucks that will be hauling material. To account for this, the truck route was modeled using the Traffic Noise Model (TNM 2.5) calculation methodology for heavy trucks in the modeling software. Figure 5-1 shows the modeled demolition activity and truck route locations. Figure 5-2 shows the location of the assessed receptors.

Figure 5-1 Demolition Activities and Truck Route Location

Table 5-1 Modeled Construction Equipment Sound Power Levels and Usage Factors

Equipment	Quantity	Individual Component Sound Power Level (dBA)	Daytime Usage Factor (%)
Excavator	2	118.9	40
Track Loader	1	96.8	40
Heavy Truck Route*	36*	N/A	N/A

* Sound power level is calculated using the Federal Highway Administration Traffic Noise Model (TNM 2.5) methodology generated in the modeling software.

Community noise equivalent levels (CNEL) are 24-hour noise metrics. To calculate the CNEL values associated with the project, the FHWA equipment usage factors were used for daytime hours when the equipment will be in use and a usage factor of zero was used for evening and nighttime hours when the equipment will not be in use.

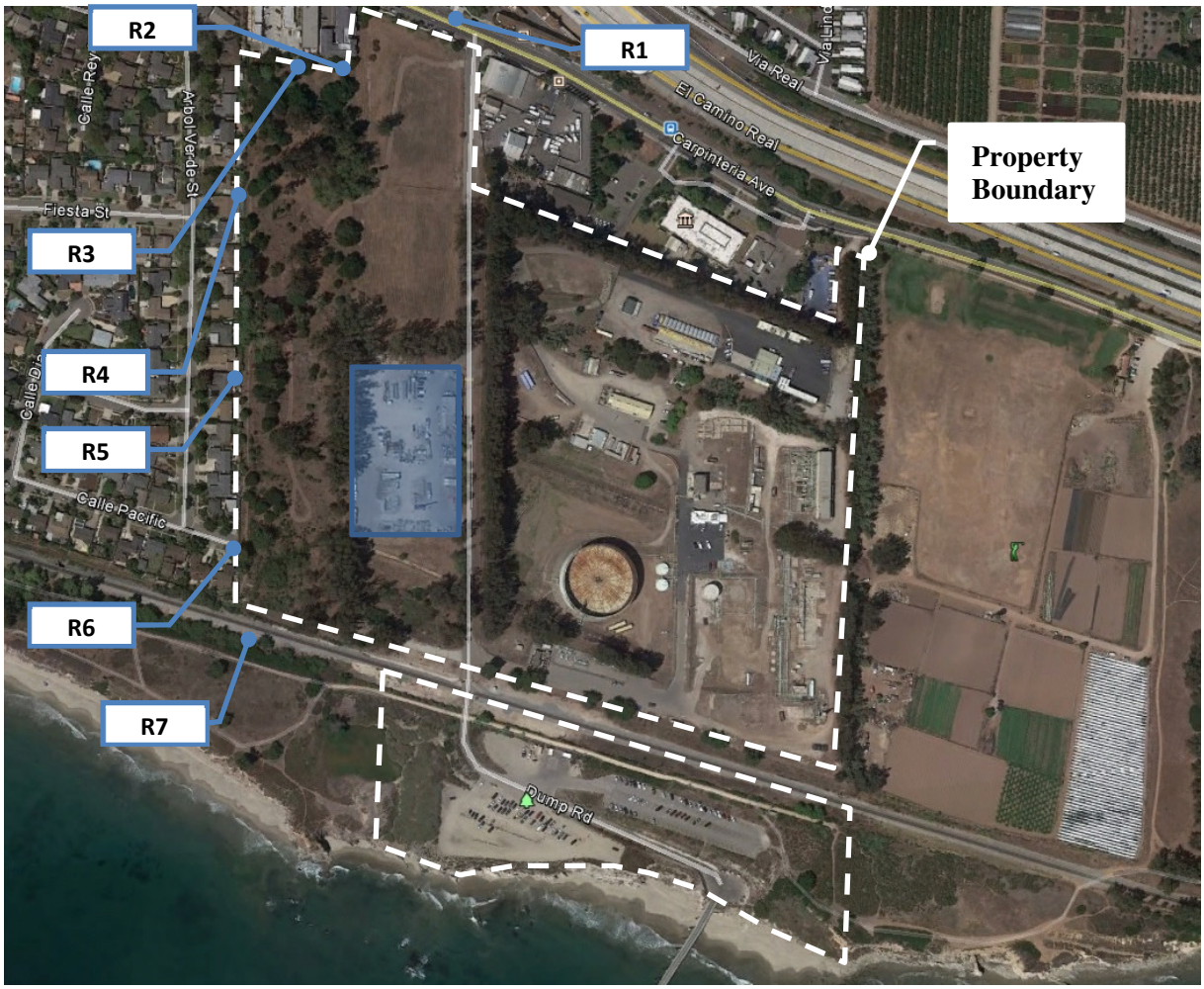


Figure 5-2 Modeled Receptor Locations

5.2 Demolition Activities Noise Modeling Results

A noise model was generated for the demolition activities. The noise modeling predicts the community noise equivalent levels (CNEL) at the site and adjacent surroundings.

The results of the noise modeling are presented in Table 5-2. The calculated noise levels represent only the contribution of the demolition activities and do not include ambient noise. Actual field sound level measurements may vary from the modeled noise levels due to other noise sources such as traffic, other human activity, or environmental factors.

Table 5-2 Demolition Activities Noise Modeling Results

Receptor	Receptor Land Use Category	Predicted Demolition Activities Noise Levels CNEL, dBA
R1	Commercial	53.2
R2	Commercial	52.6
R3	Commercial	51.2
R4	Single-Family Residential	52.7
R5	Single-Family Residential	57.2
R6	Single-Family Residential	56.9
R7	Open Space/Walking Trail (Recreational)	52.1
"Normally Acceptable" CNEL for Single Family Residential/Commercial/Recreational Land Use	**55/70/70 CNEL, dBA**	

The predicted sound levels of the demolition activities range between 51.2 CNEL, dBA and 57.2 CNEL, dBA at the properties adjacent to the project site. The predicted noise levels at R1, R2, R3 and R7 are below the "normally acceptable" community noise exposure sound level of 70 CNEL for their corresponding land use category.

The predicted noise levels at Receptor 5 and Receptor 6 are above the "normally acceptable" community noise exposure level of 55 CNEL for the single-family land use category. However, the measured ambient sound level obtained at the single-family zoning area already exceeds the "normally acceptable" community noise exposure sound level of 55 CNEL. The results of the noise modeling are shown visually in Figure 5-3 as a noise contour map.

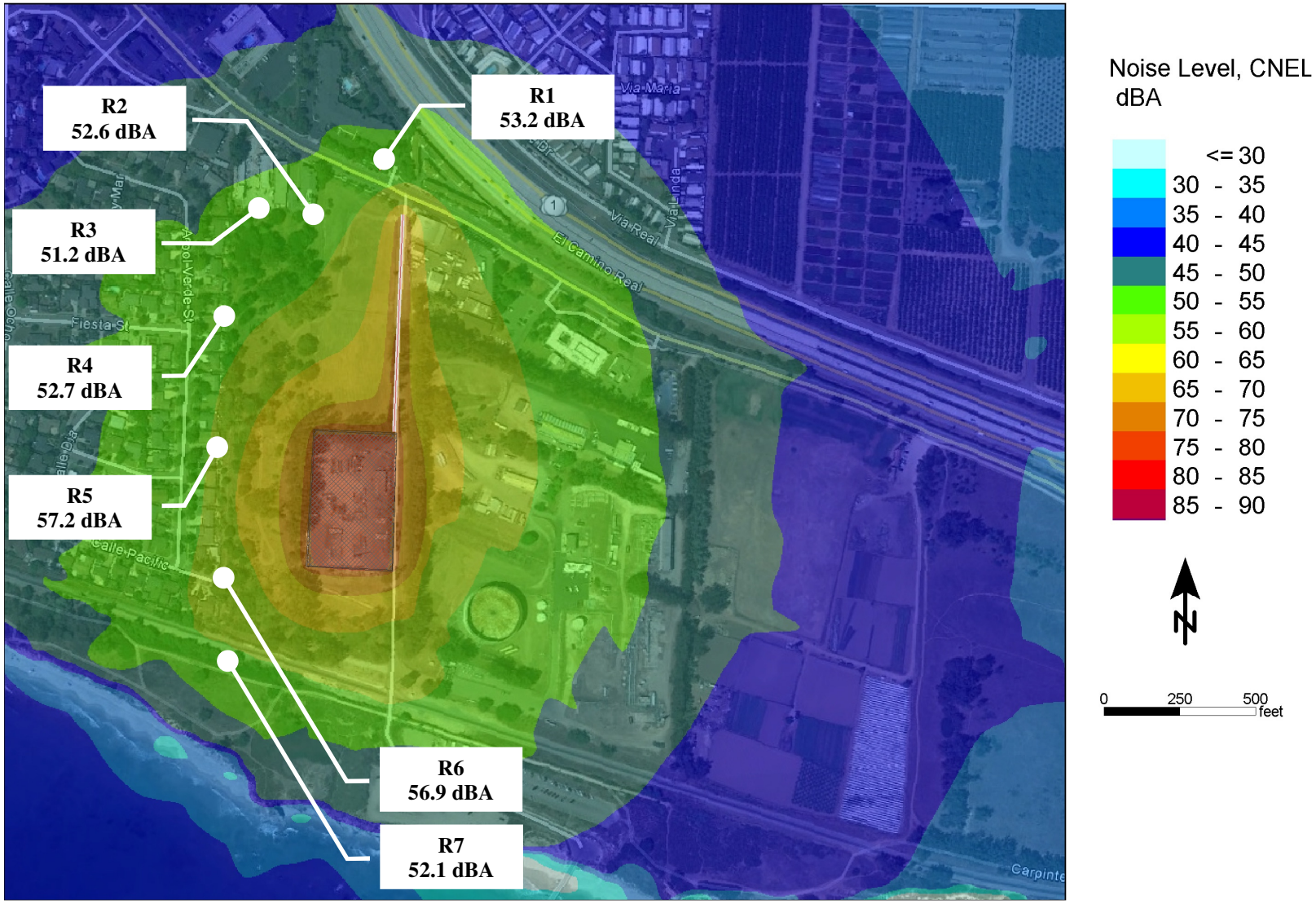


Figure 5-3 Demolition Activities Noise Contour Map (CNEL, dBA)

5.3 Noise Impact at Adjacent Properties Utilizing the City of Carpinteria Code of Ordinances

To determine if there is a noise impact at the adjacent properties during the demolition activities, the City of Carpinteria Code of Ordinances limit of five decibels above ambient was utilized for the assessment at the modeled receptors. The results of the assessment are shown in Table 5-3.

Table 5-3 Noise Levels of Predicted Demolition Activities vs. Ambient Level Contributions Noise Levels

Receptor	Corresponding Ambient Measurement Location	Predicted Demolition Activities CNEL Sound Level	Measured Ambient CNEL Sound Level	Measured Ambient CNEL plus Demolition Activities Sound Level	Increase in Ambient Noise
R1	Location 1	53.2	68.5	68.6	0.1
R2	Location 1	52.6	68.5	68.6	0.1
R3	Location 2	51.2	60.4	60.9	0.5
R4	Location 2	52.7	60.4	61.1	0.7
R5	Location 2	57.2	60.4	62.1	1.7
R6	Location 2	56.9	60.4	62.0	1.6
R7	Location 3	52.1	67.7	67.8	0.1

The results shown in the table indicate the noise level contribution of demolition activities for the decommissioning of the Carpinteria Plant will not exceed the City of Carpinteria Code of Ordinances and the "Environmental Review Guidelines" for "Temporary Construction Noise" limit of five decibels above ambient at the adjacent properties. Therefore, noise mitigation is not recommended during the demolition activities at the plant.

6. Conclusion

A 24-hour ambient sound level survey was conducted on April 8, 2021 at three locations to document the ambient CNEL sound levels of areas near the Carpinteria Plant. Using the ambient noise levels obtained during the survey, a noise impact analysis of the demolition activities for the decommissioning of the Carpinteria Plant was developed and assessed at the adjacent properties.

The measured ambient sound level obtained at the land use area described as single-family residential exceeds the City of Carpinteria General Plan "normally acceptable" community noise exposure sound level of 55 CNEL. The measured ambient sound levels obtained at the locations where land use is described as commercial and open space/walking trail were below the 70 CNEL allowable noise exposure sound level. The measured ambient sound levels obtained at the locations where land use is described as coastal industrial were below the 75 CNEL allowable noise exposure sound level.

The noise modeling results showed that Receptor 5 and Receptor 6 were predicted to have demolition CNEL noise levels above the 55 CNEL "normally acceptable" range for single family homes. However, the existing measured ambient noise levels in the area are already above the 55 CNEL level.

Therefore, the predicted noise levels and measured ambient noise levels were compared with the City of Carpinteria Code of Ordinances and "Environmental Review Guidelines" for "Temporary Construction Noise" limit of five decibels above the ambient level of the area. The calculated noise level increase ranged from 0.1 decibels to 1.7 decibels at the adjacent properties. These increases are below the allowable noise level increase of five decibels. Therefore, noise mitigation is not recommended during the demolition activities for the decommissioning of the Carpinteria Plant.

Appendix A Glossary of Acoustical Terms

Ambient Noise
The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources both near and far.

Average Sound Level
See Equivalent-Continuous Sound Level

A-Weighted Sound Level, dB(A)
The sound level obtained by use of A-weighting. Weighting systems were developed to measure sound ina way that more closely mimics the ear's natural sensitivity relative to frequency so that the instrument is less sensitive to noise at frequencies where the human ear is less sensitive and more sensitive at frequencies where the human ear is more sensitive.

C-Weighted Sound Level, dBC
The sound level obtained by use of C-weighting. Follows the frequency sensitivity of the human ear at very high noise levels. The C-weighting scale is quite flat and therefore includes much more of the low-frequency range of sounds than the A and B scales. In some jurisdictions, C-weighted sound limits are used to limit the low-frequency content of noise sources.

Community Noise Equivalent Level (CNEL)
A 24-hour A-weighted average sound level which takes into account the fact that a given level of noise may be more or less tolerable depending on when it occurs. The CNEL measure of noise exposure weights average hourly noise levels by 5 dB for the evening hours (between 7:00 pm and 10:00 pm), and 10 dB between 10:00 pm and 7:00 am, then combines the results with the daytime levels to produce the final CNEL value. It is measured in decibels, dB.

Day-Night Average Sound Level (Ldn)
A measure of noise exposure level that is similar to CNEL except that there is no weighting applied to the evening hours of 7:00 pm to 10:00 pm. It is measured in decibels, dB.

Daytime Average Sound Level
The time-averaged A-weighted sound level measured between the hours of 7:00 am to 7:00 pm. It is measured in decibels, dB.

Decay Rate
The time taken for the sound pressure level at a given frequency to decrease in a room. It is measured in decibels per second, dB/s.

Decibel (dB)
The basic unit of measurement for sound level.

Direct Sound
Sound that reaches a given location in a direct line from the source without any reflections.

Divergence
The spreading of sound waves from a source in a free field, resulting in a reduction in sound pressure level with increasing distance from the source.

Energy Basis
This refers to the procedure of summing or averaging sound pressure levels on the basis of their squared pressures. This method involves the conversion of decibels to pressures, then performing the necessary arithmetic calculations, and finally changing the pressure back to decibels.

Equivalent-Continuous Sound Level (Leq)
The average sound level measured over a specified time period. It is a single-number measure of time-varying noise over a specified time period. It is the level of a steady sound that, in a stated time period and at a stated location, has the same A-Weighted sound energy as the time-varying sound. For example, a person who experiences an Leq of 60 dB(A) for a period of 10 minutes standing next to a busy street is exposed to the same amount of sound energy as if he had experienced a constant noise level of 60 dB(A) for 10 minutes rather than the time-varying traffic noise level. It is measured in decibels, dB.

Fast Response
A setting on the sound level meter that determines how sound levels are averaged over time. A fast sound level is always more strongly influenced by recent sounds, and less influenced by sounds occurring in the distant past, than the corresponding slow sound level. For the same non-steady sound, the maximum fast sound level is generally greater than the corresponding maximum slow sound level. Fast response is typically used to measure impact sound levels.

Field Impact Insulation Class (FIIC)
A single number rating similar to the impact insulation class except that the impact sound pressure levels are measured in the field.

Field Sound Transmission Class (FSTC)
A single number rating similar to sound transmission class except that the transmission loss values used to derive this class are measured in the field.

Flanking Sound Transmission
The transmission of sound from a room in which a source is located to an adjacent receiving room by paths other than through the common partition. Also, the diffraction of noise around the ends of a barrier.

Frequency
The number of oscillations per second of a sound wave

Hourly Average Sound Level (HNL)
The equivalent-continuous sound level, Leq, over a 1-hour time period.

Impact Insulation Class (IIC)
A single number rating used to compare the effectiveness of floor/ceiling assemblies in providing reduction of impact-generated sound such as the sound of a person's walking across the upstairs floor.

Impact Noise
The noise that results when two objects collide.

Impulse Noise
Noise of a transient nature due to the sudden impulse of pressure like that created by a gunshot or balloon bursting.

Insertion Loss
The decrease in sound power level measured at the location of the receiver when an element (e.g., a noise barrier) is inserted in the transmission path between the sound source and the receiver.

Inverse Square Law
A rule by which the sound intensity varies inversely with the square of the distance from the source. This results in a 6dB decrease in sound pressure level for each doubling of distance from the source.

L_n Sound Level
Time-varying noise environments may be expressed in terms of the noise level that is exceeded for a certain percentage of the total measurement time. These statistical noise levels are denoted L_n, where n is the percent of time. For example, the L_{50} is the noise level exceeded for 50% of the time. For a 1-hour measurement period, the L_{50} would be the noise level exceeded for a cumulative period of 30 minutes in that hour.

Masking
The process by which the threshold of hearing for one sound is raised by the presence of another sound.

Maximum Sound Level (Lmax)
The greatest sound level measured on a sound level meter during a designated time interval or event.

NC Curves (Noise Criterion Curves)
A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard NC curves to determine the NC level of the space.

Noise Isolation Class (NIC)
A single number rating derived from the measured values of noise reduction between two enclosed spaces that are connected by one or more partitions. Unlike STC or NNIC, this rating is not adjusted or normalized to a measured or standard reverberation time.

Noise Reduction
The difference in sound pressure level between any two points.

Noise Reduction Coefficient (NRC)
A single number rating of the sound absorption properties of a material. It is the average of the sound absorption coefficients at 250, 500, 1000, and 2000 Hz, rounded to the nearest multiple of 0.05.

Normalized Noise Isolation Class (NNIC)
A single number rating similar to the noise isolation class except that the measured noise reduction values are normalized to a reverberation time of 0.5 seconds.

Octave
The frequency interval between two sounds whose frequency ratio is 2. For example, the frequency interval between 500 Hz and 1,000 Hz is one octave.

Octave-Band Sound Level
For an octave frequency band, the sound pressure level of the sound contained within that band.

One-Third Octave
The frequency interval between two sounds whose frequency ratio is 2^(1/3). For example, the frequency interval between 200 Hz and 250 Hz is one-third octave.

One-Third-Octave-Band Sound Level
For a one-third-octave frequency band, the sound pressure level of the sound contained within that band.

Outdoor-Indoor Transmission Class (OITC)
A single number rating used to compare the sound insulation properties of building façade elements. This rating is designed to correlate with subjective impressions of the ability of façade elements to reduce the overall loudness of ground and air transportation noise.

Peak Sound Level (Lpk)
The maximum instantaneous sound level during a stated time period or event.

Pink Noise
Noise that has approximately equal intensities at each octave or one-third-octave band.

Point Source
A source that radiates sound as if from a single point.

RC Curves (Room Criterion Curves)
A system for rating the noisiness of an occupied indoor space. An actual octave-band spectrum is compared with a set of standard RC curves to determine the RC level of the space.

Real-Time Analyzer (RTA)
An instrument for the determination of a sound spectrum.

Receiver
A person (or persons) or equipment which is affected by noise.

Reflected Sound
Sound that persists in an enclosed space as a result of repeated reflections or scattering. It does not include sound that travels directly from the source without reflections.

Reverberation
The persistence of a sound in an enclosed or partially enclosed space after the source of the sound has stopped, due to the repeated reflection of the sound waves.

Room Absorption
The total absorption within a room due to all objects, surfaces and air absorption within the room. It is measured in Sabins or metric Sabins.

Slow Response
A setting on the sound level meter that determines how measured sound levels are averaged over time. A slow sound level is more influenced by sounds occurring in the distant past that the corresponding fast sound level.

Sound
A physical disturbance in a medium (e.g., air) that is capable of being detected by the human ear.

Sound Absorption Coefficient
A measure of the sound-absorptive property of a material.

Sound Insulation
The capacity of a structure or element to prevent sound from reaching a receiver room either by absorption or reflection.

Sound Level Meter (SLM)
An instrument used for the measurement of sound level, with a standard frequency-weighting and standard exponentially weighted time averaging.

Sound Power Level
A physical measure of the amount of power a sound source radiates into the surrounding air. It is measured in decibels.

Sound Pressure Level
A physical measure of the magnitude of a sound. It is related to the sound's energy. The terms sound pressure level and sound level are often used interchangeably.

Sound Transmission Class (STC)
A single number rating used to compare the sound insulation properties of walls, floors, ceilings, windows, or doors. This rating is designed to correlate with subjective impressions of the ability of building elements to reduce the overall loudness of speech, radio, television, and similar noise sources in offices and buildings.

Spectrum
The spectrum of a sound wave is a description of its resolution into components, each of different frequency and usually different amplitude.

Tone
A sound with a distinct pitch

Transmission Loss (TL)
A property of a material or structure describing its ability to reduce the transmission of sound at a particular frequency from one space to another. The higher the TL value the more effective the material or structure is in reducing sound between two spaces. It is measured in decibels.

White Noise
Noise that has approximately equal intensities at all frequencies.

Windscreen
A porous covering for a microphone, designed to reduce the noise generated by the passage of wind over the microphone.

Appendix B Weather Data

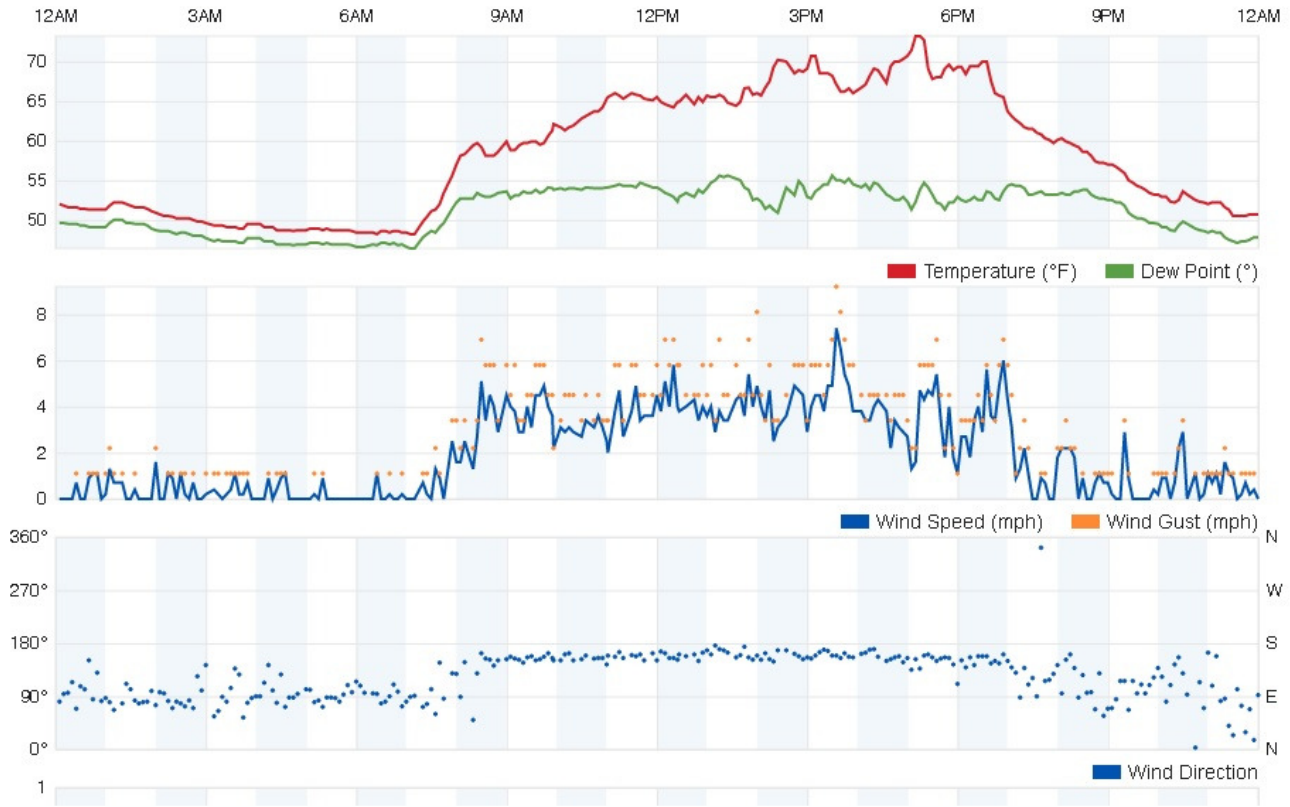
Summary
April 8, 2021

	High	Low	Average
Temperature	73.2 °F	48.0 °F	58.1 °F
Dew Point	55.8 °F	46.4 °F	50.8 °F
Humidity	95 %	47 %	79 %
Precipitation	0.00 in	--	--

	High	Low	Average
Wind Speed	7.4 mph	0.0 mph	1.0 mph
Wind Gust	9.2 mph	--	1.4 mph
Wind Direction	--	--	SSE
Pressure	30.02 in	29.85 in	--

Graph | Table

April 8, 2021



Appendix C Ambient Survey Sound Level Data

Table C-1 Recorded Hourly Average Ambient Sound Levels April 8, 2021 (dBA, L_{eq})

Date/Time	Location 1 Sound Level (dBA)	Location 2 Sound Level (dBA)	Location 3 Sound Level (dBA)
12:00:00 AM	55.7	51.0	53.0
1:00:00 AM	54.4	49.3	52.3
2:00:00 AM	55.9	50.8	52.0
3:00:00 AM	58.0	50.7	56.3
4:00:00 AM	61.9	52.7	56.1
5:00:00 AM	65.0	55.3	56.6
6:00:00 AM	65.7	57.5	56.7
7:00:00 AM	66.4	57.3	62.6
8:00:00 AM	65.4	55.9	54.5
9:00:00 AM	64.9	57.1	56.5
10:00:00 AM	65.7	51.9	65.3
11:00:00 AM	65.3	54.1	67.2
12:00:00 PM	65.6	49.5	58.4
1:00:00 PM	64.3	48.7	52.9
2:00:00 PM	66.9	50.6	53.6
3:00:00 PM	65.6	54.4	74.2
4:00:00 PM	64.7	50.8	49.5
5:00:00 PM	64.3	52.6	62.7
6:00:00 PM	63.9	59.4	68.0
7:00:00 PM	62.2	57.1	61.3
8:00:00 PM	61.2	54.6	52.9
9:00:00 PM	60.2	55.5	73.0
10:00:00 PM	59.7	53.6	52.3
11:00:00 PM	57.4	51.6	51.4