Acoustical Noise Study for Clos Soléne Winery Paso Robles, CA

Project Location:	Clos Soléne Winery 2040 Niderer Road Paso Robles, CA 93446
Client:	Clos Soléne Winery Guillaume Fabré 2040 Niderer Road Paso Robles, CA 93446
Prepared for:	Kirk Consulting Attn: Lacey Zubak 8830 Morro Road Atascadero, CA 93422 (805) 461-5765 lacey@kirk-consulting.net
45dB Project Number:	23005

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Summary

45dB Acoustics, LLC ("**45dB**") has measured and acoustically modeled winery activity levels and wine processing equipment at the Clos Soléne Winery in Paso Robles, California ("Property") to analyze potential noise impacts for the proposed expansion of the winery operations ("Project").

We measured sound levels from a wine club activity on March 31, 2023 as well as from grape processing equipment, and then used those as inputs to our SoundPLAN® 3D noise model of the site to determine sound level contours for existing winery activities, including those associated with the wine club and existing winery processing. We then analyzed whether the Project, which proposes relocating the winery facilities and operations eastward on the Property, will generate sound levels that will cause potential noise impacts. We conclude the following:

1. The Project's proposed winery activities are determined to comply with the noise limits set forth in the County's Land Use Ordinance and, given the winery activities will now generally be located indoors, the Project will reduce exterior noise as compared to current winery activities;

2. The equipment associated with wine processing is exempt from the noise limits set forth in the County Code. The Project proposes increasing the winery's annual case production from 5,000 cases to 10,000 cases. While this increase in production will not increase the overall noise produced by the wine processing equipment, it will increase the number of hours in which the wine processing equipment is operating from approximately 4 to 5 hours a day during harvest to 8 to 10 hours a day during harvest, all of which will occur during daytime hours. As a result, this report proposes methods for reducing the noise associated with the wine processing equipment.

In addition, based upon the Project description provided by the winery, no excessive groundborne vibration nor increase in groundborne vibration levels is anticipated to be caused by the Project, nor would construction noise generate excessive noise in a manner that would be inconsistent with County standards.

Contents

List of Figures

List of Tables

1 Introduction

This noise study is provided as additional information for the expansion of winery operations ("Project") at the Clos Soléne Winery in Paso Robles, California ("Property") proposed in the application for a conditional use permit (DRC2021-00025).

The following factors are considered:

- The topographical relationship of noise sources (agricultural wine processing and wine activities, separately) and the nearby potential sensitive receptors;
- Identification of noise sources and their characteristics, and evaluation of predicted sound levels at the Property's boundaries;
- Factors affecting sound level prediction at the Property's boundaries, noise attenuation measures to be applied (if any), and analysis of the noise propagation considering the physical layout of the built environment; and,
- Information on fundamentals of noise and vibration to aid in interpreting the report

The Property is located at 2040 Niderer Road in San Luis Obispo County, approximately 4 miles west of Paso Robles, California in an area with rolling hills. The Property is bordered by other agricultural properties with Niderer Road to the west, and the nearest residences located approximately 1,200 feet to the southeast and 2,000 feet to the east and west. Road noise is relatively low in level, and this rural area is generally rather quiet.

The site plan for the Project is shown in Figure 1 and a satellite view of the site (highlighted in yellow) is shown in Figure 2. Generally, the Project proposes: (1) moving and expanding the winery operations to the eastern portions of the Property by constructing approximately 1,800 square feet of public tasting room area, and approximately 20,400 of production and non-tasting room area; (2) increasing the winery production from 5,000 cases per year to 10,000 cases per year; and, (3) adding two new wine club release sessions per year. The winery presently hosts the wine club activities in a tent on the existing wine processing or "crush" pad. As part of the Project, these activities will primarily take place within the wine cave or the tasting "pods." A more detailed description of the Project is provided in the application.

To assess the Project's potential for noise generation, we measured noise levels during a wine club activity, and separately while wine processing equipment was operating. Both of these types of on-site activities are not typical weekly or daily activities, and so these measurements, which were used to extrapolate potential noise generation at the Project, represent a conservative estimate for the Project's potential noise generation. Modeling of these sound sources in SoundPLAN® 3D modeling software was then carried out to present sound levels due to these sources across the site and surrounding areas. Conclusions were drawn from these analyses regarding the Project's potential noise impacts.

2 Compliance Requirements

2.1 Local Regulation

The County's Maximum Allowed Exterior Noise Level Standards from the San Luis Obispo County's Land Use Ordinance, Section 22.10.120[1], are reprinted in Figure 4. The Ordinance states the Hourly L_{eq} and Maximum L_{max} exterior noise levels for both Daytime (7 a.m. – 10 p.m.) and Nighttime (10 p.m. to 7 a.m.) periods. For this study, only daytime periods have been evaluated, as the Project only proposes activities during daytime hours in order to comply with the Code.

Noise sources associated with construction are exempt from the County's noise standards, provided such activities do not take place before 7:00 a.m. or after 9:00 p.m. on any day except Saturday or Sunday, or before 8:00 a.m. or after 5:00 p.m. on Saturday or Sunday.

Noise sources associated with agricultural equipment, such as from wine processing are also exempt from the County's noise standards.

The Property is surrounded by Agriculture Land Use Areas[2], however some residences are located on neighboring properties. These potential residential locations are identified by their addresses in Figure 2. For the purposes of this analysis, we evaluate the County Code noise requirements at the Clos Soléne property lines. Residences on the Project property are not included as part of this analysis.

All sound pressure levels in this report are in units of A-weighted decibels (dBA), for direct comparison to the Ordinance.

3 Site Measurements: Activities and Grape Processing

Site noise measurements were conducted on the afternoon of March 31, 2023. The purpose was twofold—to characterize/measure the agricultural grape/wine processing equipment levels, as well as the sound levels from a typical wine club activity having amplified voice inside an activity tent. Grape processing equipment was operated and measured prior to the arrival of winery activity guests, such that measured levels from the grape processing equipment and winery activities are separate and do not interfere/contribute to one another. These noise levels enable a conservative estimate of potential Project noise impacts as the processing equipment only operates during harvest and the wine club activities only take place 8 days per year, per information provided by the applicant.

ANSI Type 2 sound levels meters (SoftdB Piccolo II) calibrated with a Type 1 calibrator (Brüel&Kjær 4230) were utilized to measure sound levels nearby along the northern property

[1] San Luis Obispo County, CA Municipal Code, Land Use Ordinance, Noise Standards. https://library.municode.com/ca/san_luis_obispo_county/codes/county_code?nodeId=TIT22LAUSOR_ART3SIPLPRDEST_CH22.10GEPRDEOPST_22.10.120NOST

[2] County of San Luis Obispo. Department of Planning & Building, Land Use View. https://gis.slocounty.ca.gov/Html5Viewer/Index.html?configBase=https://gis.slocounty.ca.gov/Geocortex/Essentials/REST/sites/PL_LandUseView/viewers/PL_LandUseView/virtualdirectory/Resources/Config/Default

line—labeled “LOC#1” in the site plan of Figure 3—as well as near the activity tent—labeled “LOC#2” in Figure 3.

Prior to the wine club activity, between approximately 4-5pm, SLM#2 was utilized to measure sound levels from each main piece of wine processing equipment: vibrating table; sorting table; elevator / crusher; the cleaning/sorting/destemmer combination; and the generator/air compressor/optical puff machine combination. Photos of the equipment are shown in Figure 8 and Figure 9. If all equipment operates simultaneously as a worst-case condition, the total sound level from all equipment is 81 dBA. According to information provided by the applicant, the Project will provide a sufficient power supply for the wine processing equipment. As a result, the Project will eliminate the need for the generator, which would decrease the total calculated sound pressure level by 1 dB, to 80 dBA at a 10ft / 3m distance.

45dB personnel noted a tractor passing on the property at 18:06, which was evident in the data at both locations. Tractors are associated only with agricultural equipment and not winery activities, and as such are also exempt from County Code limits. Tractor noise is not a contributor in the grape/wine processing equipment measurements of Table 1.

Resulting measured sound levels as both hourly and 1-minute equivalent levels for the sound level meter at the LOC#1 location are shown in Figure 6, whereas those for LOC#2 location are shown in Figure 7.

Sound levels from near the activity tent to the nearest property line are attenuated by the distance (approximately 60ft /18m), approximately 12 dB.

Table 1: March 31, 2023 measured levels (dBA)

Sound Source	Operating Sound Pressure Level, dBA at 10ft / 3m	LOC#1 (Property Line)	LOC#2 (near activity Tent)
Activity Tent Hourly LA_{eq} (5 – 10pm)		43-50[1]	55-62
Activity Tent Maximum		70	82
WINE PROCESSING EQUIPMENT:			
Vibrating Hopper	68	-	-
Sorting Table	60	-	-
Elevator (for grapes) with Crusher	64	-	-
Cleaning/Sorting/Destemmer	78	-	-
Generator & Air Compressor & Optical Puff Machine[1]	76	-	-
CALCULATED TOTAL SOUND LEVEL FOR EXISTING WINE PROCESSING, at 10ft/3m:	***81***	-	-
CALCULATED TOTAL SOUND LEVEL WITHOUT GENERATOR:	***80 (i.e., 1 dB of Noise Reduction)***	-	-
CALCULATED TOTAL SOUND LEVEL WITHOUT GENERATOR and WITH PROPOSED DESTEMMER REPLACING EXISTING:	***79 (i.e., 2 dB of Noise Reduction)***	-	-
Note 1: MQ Power DCA25SSIU4F Generator specification is 65dBA at 23ft (72.2 dBA at 10ft); Ozen OASC 7 Air Compressor specification is 69 dBA at a deduced distance of 10ft corroborated with on-site measurements; and sifting puff machine is then 72 dBA at 10ft.			

Measured hourly sound levels (LAeq-1hr) measured near the activity tent were fairly constant at the activity from 6-10pm, and were below both the Hourly and Maximum County daytime sound level limits.

4 Modeled Sound Levels and Determination of Compliance

SoundPLAN® is a state-of-the-art sound propagation modeling software package that calculates sound levels afield while taking into account the air and ground attenuation factors, terrain variation, the built environment, and other relevant factors. This software has incorporated many noise propagation standards—for road traffic, this model utilizes the Federal Highway Administration's Traffic Noise Model (TNM) to accurately calculate noise propagation, taking into account the built environment, terrain, ground and air attenuation. The ISO 9613 calculation standard implemented into SoundPLAN® conservatively assumes downwind propagation in all

directions from other non-road noise sources such as the wine club activity and wine production equipment. More details about SoundPLAN®, TNM, and ISO 9613-2 can be found in Section 8.3.

A 3-dimensional view of geometry showing representative buildings on the terrain is shown in Figure 5.

All sound level contour plots presented here show the approximate property lines of the Property.

4.1 Local Traffic

Acoustic prediction modeling for this report utilizes the FHWA's Traffic Noise Model (TNM) to predict ambient noise levels based on Annual Daily Traffic (ADT) data. These levels are shown to provide a reference for the area.

Estimated ADT traffic counts for local roads (Table 2) are input into SoundPLAN® which can apportion the default count into vehicle types including automobiles and medium trucks. SoundPLAN® apportions the counts into daytime and nighttime hours, and appropriate vehicle speeds are input in order to predict the outdoor noise levels using the Traffic Noise Model. Percentage of medium trucks is conservatively high.

Table 2: 2023 Road Traffic Count Input

Road	2023 AADT	Assumed Percentage of Medium Trucks (Day)
Niderer Road	150	5%
Via Munoz (estimated)	20	5%
Clos Soléne driveway	30	15%

For this type of analysis, road traffic noise is conservatively modeled to be at the lower end of the range for the roadways, since quieter ambient sound levels would show a more distinctive increase in assessing the Project's potential noise impacts.

4.2 Winery Activities

Typically, existing wine tasting activities take place partially inside the existing tasting room onsite and partially outside on a patio, and the winery averages 145 guests per week. The winery also hosts non-advertised wine club activities on eight days per year where up to 80 guests are invited to the site at any given time.

To provide a conservative estimate of noise levels at the existing winery, and modeled noise from the Project, sound level contours for a wine club activity in the existing facilities with

amplified speech inside a tent as measured on March 31, 2023 are shown in Figure 11 including road traffic as defined above. Modeled/calculated sound levels during the activity at representative points along the Property line can be found in Table 3.

The Project proposes moving the winery activities to the southeastern portion of the Property and the construction of new tasting pods, a wine cave, administrative offices, restrooms, and parking. Wine tasting and wine club activities will primarily be held within the tasting pods, which would be partially enclosed (with doors open) or fully enclosed (with doors closed) as well as within the wine cave. Tasting room doors face toward the interior of the property, and away from neighboring receivers to the south. These rooms are located further away from receivers to the west and north. The Project anticipates a 30% increase in visitors (190 visitors per week) to the winery each week with tasting restricted to by appointment only, and proposes hosting two additional non-advertised wine club sessions per year (on days that already include wine club sessions). Despite this increase in visitors to the site, the Project is expected to improve property line noise conditions from the existing environmental baseline by emitting significantly lower sound levels than the existing wine tasting/tented activity location because it will move wine tasting activities to be primarily indoors. Even with tasting pod doors open, small groups of approximately 8 people (50% conversing) do not rise to the level that they would add further to the noise levels provided in Table 3 [Column C].

Based upon previous **45dB** experience and the measurements of noise discussed above, the Project is anticipated to result in an overall reduction in noise associated with wine tasting activities given the relocation of these activities to primarily indoors. Ambient noise during the daytime ranges from approximately 30 to 45 dBA in the vicinity of the Project. Conservatively assuming an otherwise quiet background ambient sound level of 30 dBA, it is estimated that the Project will improve noise conditions in the Project vicinity from the existing baseline. With approximately 10-12 people in each pod (no amplified voice/music, only 4 conversations at reasonable level), even with pod doors open the resulting sound levels will be less than from the present operations at the winery. Similarly, winery club gatherings/activities in the wine cave are not expected to reach the levels at nearby property lines that the measured (tented) winery club activities reached. And of course, with winery pod/room and cave doors closed, these sources are absent.

To provide a quantitative analysis of the Project's potential noise impacts, Table 3 compares a conservative scenario of potential noise impacts at the Property. Column A identifies various locations along the Property's boundary as identified in Figure 10. Column B provides the hourly daytime noise level estimated during a tented wine club event at the existing winery in these locations. Column C shows the receiver sound levels with the proposed Project including parking lot noise typical for this type of business, plus the anticipated worst case of an open-air winery gathering of people within the tasting pods, 30 people between the buildings (outside, under and near the covered breezeway), and 50% speaking with slightly raised voice at any time. Column D provides the change in the hourly daytime sound level at these property line locations for the proposed winery Project, assuming an otherwise low background ambient sound level of 30 dBA. Column D is not simply the difference between the existing and proposed sound level contributions from winery activities—after adding in a conservatively low background sound level of 30 dBA the differences calculated at each receiver are shown in Column D. (If the

background ambient at these locations is higher, the differences calculated in Column D will be lower.) This is a conservative analysis because, as mentioned above, the Project will only typically have 190 guests per week spread across varying tasting times arranged by appointment and will move wine tasting activities primarily to the interior of the tasting pods and the wine cave.

As shown in Table 3, even under this conservative scenario, the Project will improve noise conditions during wine tasting activities as compared to existing conditions. The only location that will experience an increase in sound levels under this scenario is location S2, and noise at that property line is still determined to comply with the County's noise standards. If ambient levels at these locations are higher, such as 45 dBA, which is a common rural daytime noise level, the anticipated changes will be less than those shown in Column [D]. For reference, a change in sound level from one moment to the next of 10 dB is perceived as half as loud (See Table 8 in the Appendix.)

In sum, the Project is expected to improve noise conditions from the existing environmental baseline at all but one adjacent locations by emitting significantly lower sound levels than the existing wine tasting location.

Table 3: Property Line Daytime Hourly Sound Levels due to Winery Tent Activity

[A] Receptor Location	[B] Hourly Noise Level Due Only to Winery Activity at Current Pad Location (dBA)	[C] Hourly Noise Level due to Proposed Winery Activity at New Location (dBA)	[D]** Project's Change, Assuming Ambient Noise Level of 30dBA (dB)
N1	48*	11*	-18
N2	32*	23*	-3
N3	28*	12*	-2
NE1	22*	--*	-1
NW1	16*	5*	--
S1	38	15*	-9
S2	32	44	+10
S3	15*	--*	--
SE1	12*	--*	--
SW1	13*	--*	--

*** Assuming ambient noise levels for this rural area are generally 30-45dBA, site noise sources (e.g. from winery activities) below approx. 30 dBA will not substantially contribute to ambient sound levels**

**** Column D values are not simply arithmetic differences (e.g., addition or subtraction) because decibels combine logarithmically and not arithmetically.**

4.3 Grape Processing

Figure 12 shows sound level contours from all of the grape processing equipment, operating simultaneously for a worst-case scenario, at the current mechanical pad location. Table 4 below shows sound levels for grape processing at the existing pad (Column [B]) and at the proposed pad location near the wine cave doors (Column [C]). These are the levels when all equipment is operating, and it can be assumed that the equipment operates for a full hour—so these are also considered to be hourly sound levels. The Project will eliminate the need for the diesel generator, which would reduce the total noise for the entire group of equipment by 1 dB. That change is reflected in the levels in Table 4. Similarly to Table 3, if a low background ambient is assumed for these locations, the differences calculated in Column D include that background sound level. As before, if the background ambient at these locations is higher, the differences calculated in Column D will be lower.

Table 4: Property Line Daytime Hourly Sound Levels due to Grape Processing

[A] Property Line Location	[B] Noise Level Due to Grape Processing at Existing Pad** (dBA)	[C] Noise Level Due to Grape Processing at Proposed Project Pad (dBA)	[D]*** Change in Noise Level due to Project Processing Relocation Assuming Ambient Noise Level of 30dBA $(dB)^2$
N1	66	41	-25
N2	43	59	+16
N3	39	48	+8
NE1	35	31	-2
NW1	42	35	-6
S1	36	42	+5
S2	43	48	+5
S3	26	26*	--
SE1	23	21*	--
SW1	30	28*	-1

*** Assuming ambient noise levels for this rural area are generally 30-45dBA, site noise sources (e.g. from winery activities) below approx. 30 dBA will not substantially contribute to ambient sound levels**

**** Wine grape processing levels are presented for reference only; agricultural-related noise is exempt from the Code**

***** Column D values are not simply arithmetic differences (e.g., addition or subtraction) because decibels combine logarithmically and not arithmetically.**

As agricultural equipment such as this are exempt from the County's noise level limits, there is no determination of Code compliance to be made. The Project proposes relocating the processing equipment to the eastern portion of the Project site and increasing the operation of the equipment from approximately 4 to 5 hours a day during harvest to approximately 8 to 10 hours a day

during harvest. As a result, this report analyzes how the relocation of the equipment and the increased hours will impact noise at the Project site.

The increase in production of cases of wine does not increase the sound levels emitted during grape processing. Rather, the increase in production means that grape processing will occur more frequently or for more hours of a day. If case production is doubled, it is anticipated that grape processing total time/duration would also double, since the equipment will remain the same. Additionally, as shown above, if the processing occurs outside in the new pad location, the Project will reduce noise levels at some Property boundaries, and increase noise at other locations.

Because the grape processing equipment is already assumed to operate continuously for any given daytime hour, there is no increase in hourly or maximum sound levels as defined by the Code due to an increase in case production. However, to address an increase of noise *exposure time* (not directly addressed by the Code but perhaps still of interest) caused by the increased duration of equipment operation and the new location, it is recommended to take one or more of the following actions to ensure the Project will not result in noise impacts:

- Employ temporary noise screens of at least 6ft in height around the pad if the processing equipment is operated outside, which will reduce noise at the Property boundaries by approximately 6 dB;

- For at least 60% of the days in which the processing equipment is operating, restrict operation to the interior of the wine cave with the doors closed, which will reduce noise at the Property boundaries by 10 to 20 dB when employed;

- Replace the destemmer with a quieter model selected by the applicant/owner, which is anticipated to reduce the total sound level of the equipment group by approximately 1 dB;

- For the situation where the equipment is operated inside the wine caves, adding acoustically absorptive panels to the cave walls will reduce levels by 1 to 2 dB both in the cave and at the door openings and beyond.

Groundborne vibration was not detected by **45dB** personnel from this equipment.

5 Short Term Construction Noise

Construction of the Project would generate noise that may temporarily increase noise levels at nearby residential receivers. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment operating on site, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction of the Project would involve site improvements, excavation, construction of foundations, building framing, paving, and landscaping. The hauling of excavated material and construction materials would generate truck trips on local roadways.

Construction activities for individual projects are typically carried out in stages. During each stage of construction, there would be a different mix of operating equipment. Construction noise levels would vary by stage and vary within stages based on the amount of equipment in operation and location where the equipment is operating. The phases of construction and associated larger equipment are shown in Table 5.

Table 5: Large Equipment Used for Construction

Scope of Work	Anticipated Large Equipment
Grading, Caves	Dump Truck, Dozer, Backhoe
Utilities	Backhoe, Mini Excavator
Foundations and Pads	Concrete Mixer Truck, Concrete Pump
Framing	Forklift, Compressor
Driveways, Parking Lots	Concrete Mixer Truck, Concrete Pump

Short-term construction activities for a project of this scope can generate moderate noise levels, especially during the construction of project infrastructure when limited heavy equipment is used. The highest maximum instantaneous noise levels generated by Project construction could typically range from about 80 to 85 dBA L_{max} at a distance of 50 feet from the noise source.

Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding by buildings, noise walls, or terrain will result in lower construction noise levels at distant receptors.

Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. Construction noise impacts primarily occur when construction activities are during noise-sensitive times of the day (early morning, evening, or nighttime hours), when construction occurs in areas immediately adjoining noise sensitive land uses, or when construction durations last over extended periods of time. Specific sound levels from construction equipment are shown in Table 6.

There is an on-site residence located in the central portion of the Project site and the nearest off-site residences are located approximately 325 feet west of proposed driveway improvements near Niderer Road and approximately 570 feet southeast of the proposed winery facility.

Construction related noise would be short-term, intermittent and would not result in a permanent increase in ambient noise within the Project area. According to County Code Section 22.10.120.A.4, construction noise is exempt from the County's noise standards between the hours of 7:00 a.m. and 9:00 p.m. on weekdays and 8:00 a.m. and 5:00 p.m. on weekends. Proposed construction activities would be limited to the hours specified in the County LUO and would not generate excessive noise in a manner that would be inconsistent with County standards.

Table 6: Typical Construction Equipment Noise Levels (dBA)

Equipment Type	Typical Noise Level 50ft from Source
Air Compressor	78
Concrete Mixer, Dozer, Excavator, Jackhammer, Man Lift, Paver, Scraper	85
Bobcat Tractor	78
Backhoe, Compactor	80
Concrete Pump	82
Crane, Mobile	83
Heavy Truck	84

Source: FHWA

Construction noise can also be proactively managed using some common noise reduction strategies in order to minimize any potential impact. Such measures include:

- Construction equipment should be well maintained and used judiciously to be as quiet as practical.
- Mobile or fixed “package” equipment (e.g., arc welders, air compressors) should be equipped with shrouds and noise control features that are readily available for that type of equipment.
- Equip all internal combustion engines with manufacturer recommended muffler, and air-inlet silencers (where appropriate). Do not operate an internal combustion engine on the job site without the appropriate and maintained muffler.
- Select quieter demolition methods, where possible.
- Utilize “quiet” models of air compressors and other stationary noise sources wherever feasible. Select hydraulically or electrically powered equipment and avoid pneumatically powered equipment where feasible.
- Prohibit unnecessary idling of internal combustion engines.
- Backup alarms are, by their very nature, of a high decibel level and must be audible above construction noise for safety reasons. Minimize, and eliminate whenever possible, the use of backup beeping and alarms by maintaining forward motion and turning around rather than reversing and use a traffic spotter wherever possible.

- Locate stationary noise-generating equipment as far as possible from sensitive receptors when adjoining construction sites. Construct temporary noise barriers or partial enclosures to acoustically shield such equipment where feasible.

With the limited duration of the noise-generating construction period, and utilizing the above measures, the substantial temporary increase in ambient noise levels associated with construction activities would generally be less-than-significant.

6 Conclusions and Recommendations

Based on the above measurements and analysis, existing tented activities at least 115ft (35m) from any property line, no mitigation is needed for these activities to remain within the County's Code limits for hourly and maximum noise levels.

Proposed wine club activities (without amplified voice, and with doors open or closed) inside the tasting rooms are anticipated to comply with the Code and improve noise at the property's boundaries as compared to existing winery operations. Proposed club activities with or without amplified voice in the new wine caves are also anticipated to comply with the Code limits and improve noise at the property's boundaries as compared to existing winery operations.

As agricultural processing equipment is exempt from Code noise limits, levels measured from this equipment at the existing situation was reported here. If this equipment is moved inside the wine caves and cave doors are closed, this would provide a very significant decrease in sound levels due to this exempt equipment; moving crushing activities into the wine cave for more than half the total proposed production schedule maintains the noise emission duration to below existing conditions. Other methods for reducing noise levels of sound emission and potential impact to the surrounding area from this equipment at either location are to utilize moveable noise barriers, replacing equipment with quieter models where possible, and adding absorption to the new cave interior around/near the processing equipment, as described in the previous section.

No excessive groundborne vibration nor increase in groundborne vibration levels is anticipated to be caused by the proposed project.

According to the County Code, construction noise is exempt from the County's noise standards between the hours of 7:00 a.m. and 9:00 p.m. on weekdays and 8:00 a.m. and 5:00 p.m. on weekends. Proposed construction activities would be limited to the hours specified. Construction noise would not generate excessive noise in a manner that would be inconsistent with County standards.

The conclusions and recommendations of this acoustical analysis are based upon the information known to 45dB Acoustics, LLC ("**45dB**") at the time the analysis was prepared concerning the proposed site plans, traffic volumes, equipment, and proposed activity types. Any significant changes to these factors will require a reevaluation of the findings of this report. Additionally, any significant future changes in site plan, noise regulations, or other factors beyond **45dB**'s control may result in long-term noise results that differ from those described by this analysis.

7 Figures

Figure 1: Project site plan, eastern portion cropped (Signum Architecture LP)

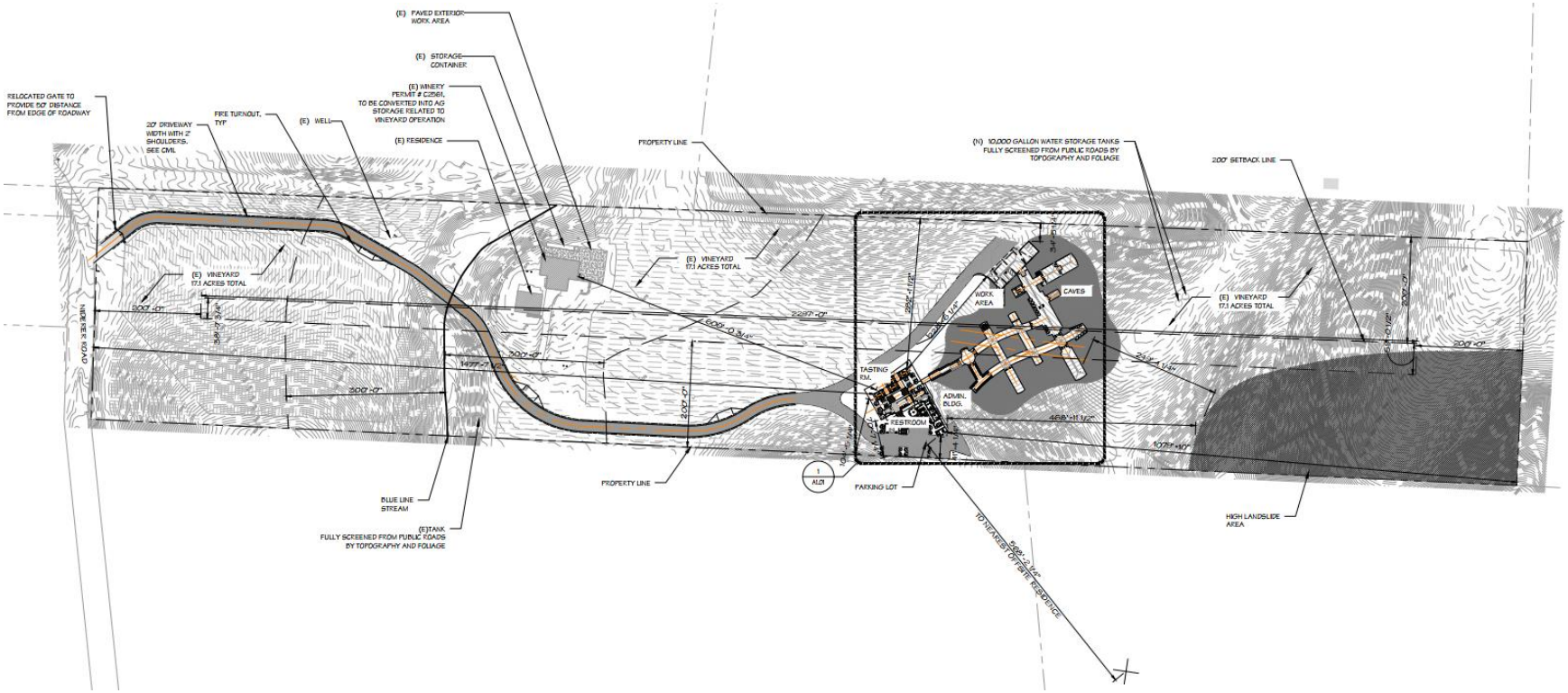


Figure 2: Satellite View of Site (Outlined in Yellow) and Nearby Residences

Figure 3: Site Plan with Measurement Locations

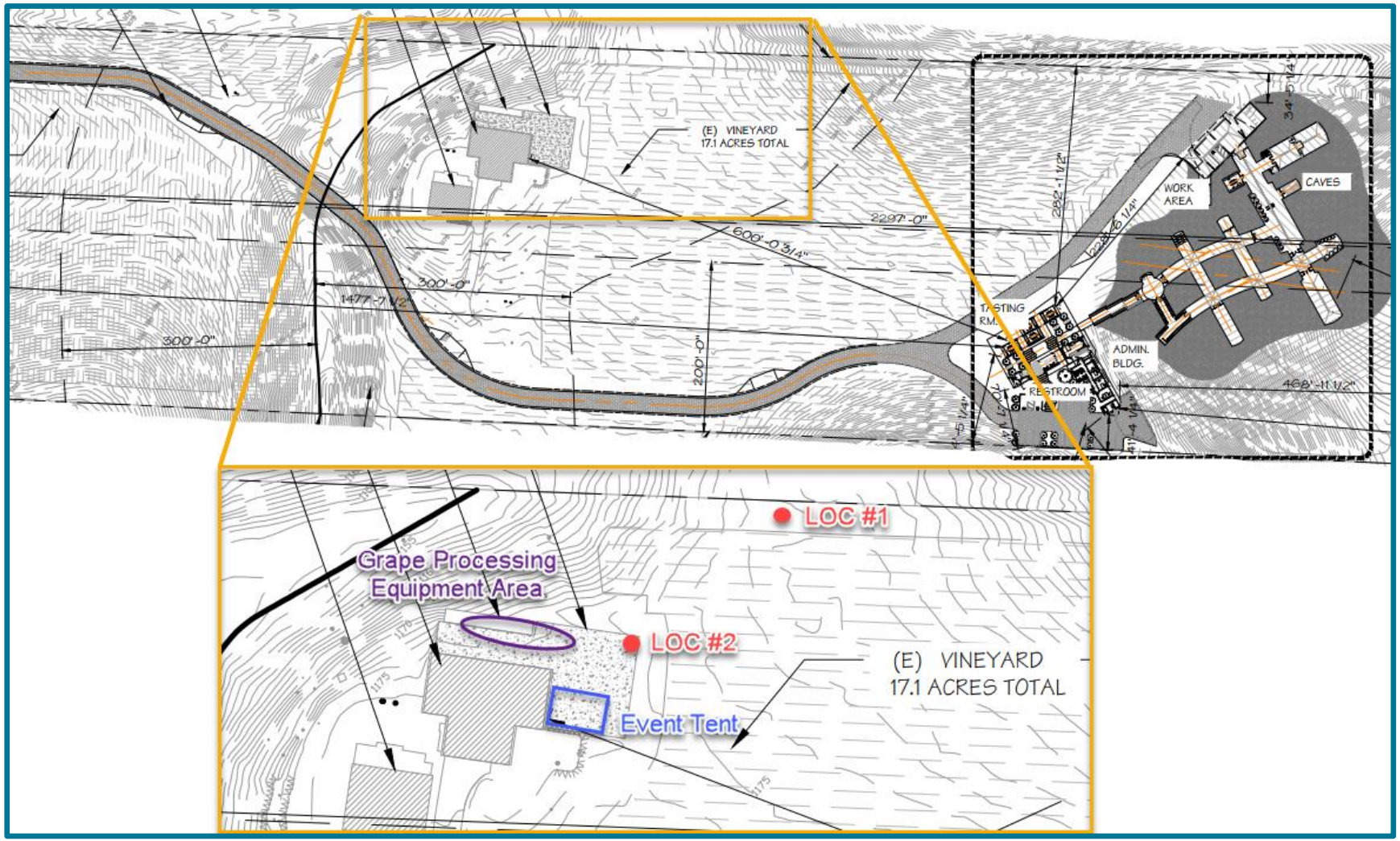


Figure 4: County Land Use Ordinance, Section 22.10.120 B – Exterior noise level standards (reprinted)

B. Exterior noise level standards. The exterior noise level standards of this Section are applicable when a land use affected by noise is one of the following noise-sensitive uses: residential uses listed in Section 22.06.030 (Allowable Land Uses and Permit Requirements), except for residential accessory uses and temporary dwellings; health care services (hospitals and similar establishments only); hotels and motels; bed and breakfast facilities; schools (pre-school to secondary, college and university, specialized education and training); churches; libraries and museums; public assembly and entertainment; offices, and outdoor sports and recreation.

1. No person shall create any noise or allow the creation of any noise at any location within the unincorporated areas of the county on property owned, leased, occupied or otherwise controlled by the person which causes the exterior noise level when measured at any of the preceding noise-sensitive land uses situated in either the incorporated or unincorporated areas to exceed the noise level standards in the following table. When the receiving noise-sensitive land use is outdoor sports and recreation, the following noise level standards shall be increased by 10 dB.

Maximum Allowed Exterior Noise Level Standards		
Sound levels	**Daytime 7 a.m. to 10 p.m.**	**Nighttime (1) 10 p.m. to 7 a.m.**
Hourly Equivalent Sound Level (L_{eq}, dB)	50	45
Maximum level, dB	70	65

Notes:
1. Applies only to uses that operate or are occupied during nighttime hours

2. In the event the measured ambient noise level exceeds the applicable exterior noise level standard in Subsection B.1, the applicable standard shall be adjusted so as to equal the ambient noise level plus one dB.

3. Each of the exterior noise level standards specified in Subsection B.1 shall be reduced by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

4. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the exterior noise level standards.

Figure 5: 3D View of Model Geometry

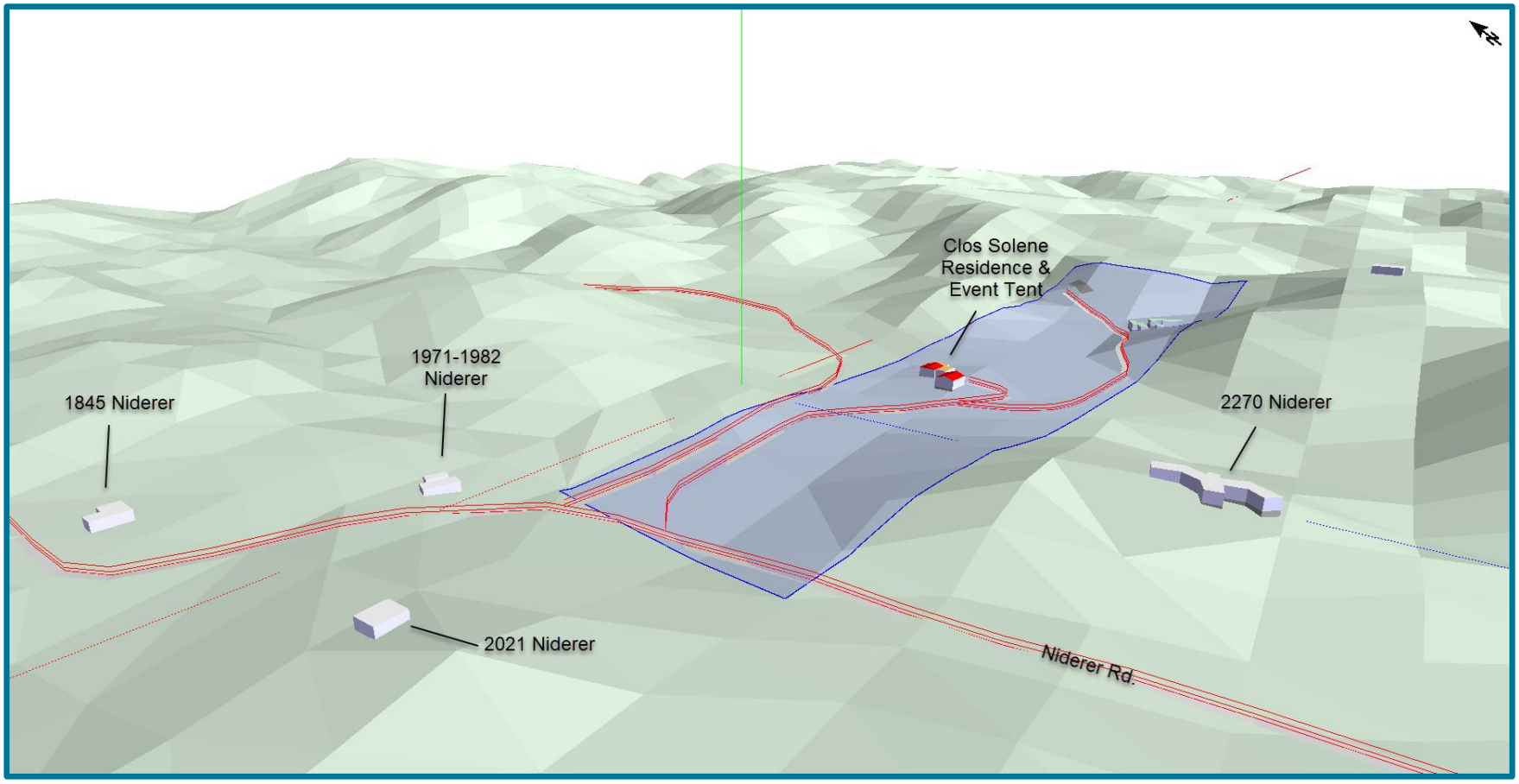


Figure 6: 1-hour and 1-min Equivalent Sound Levels, at Northern Property Line (LOC #1)

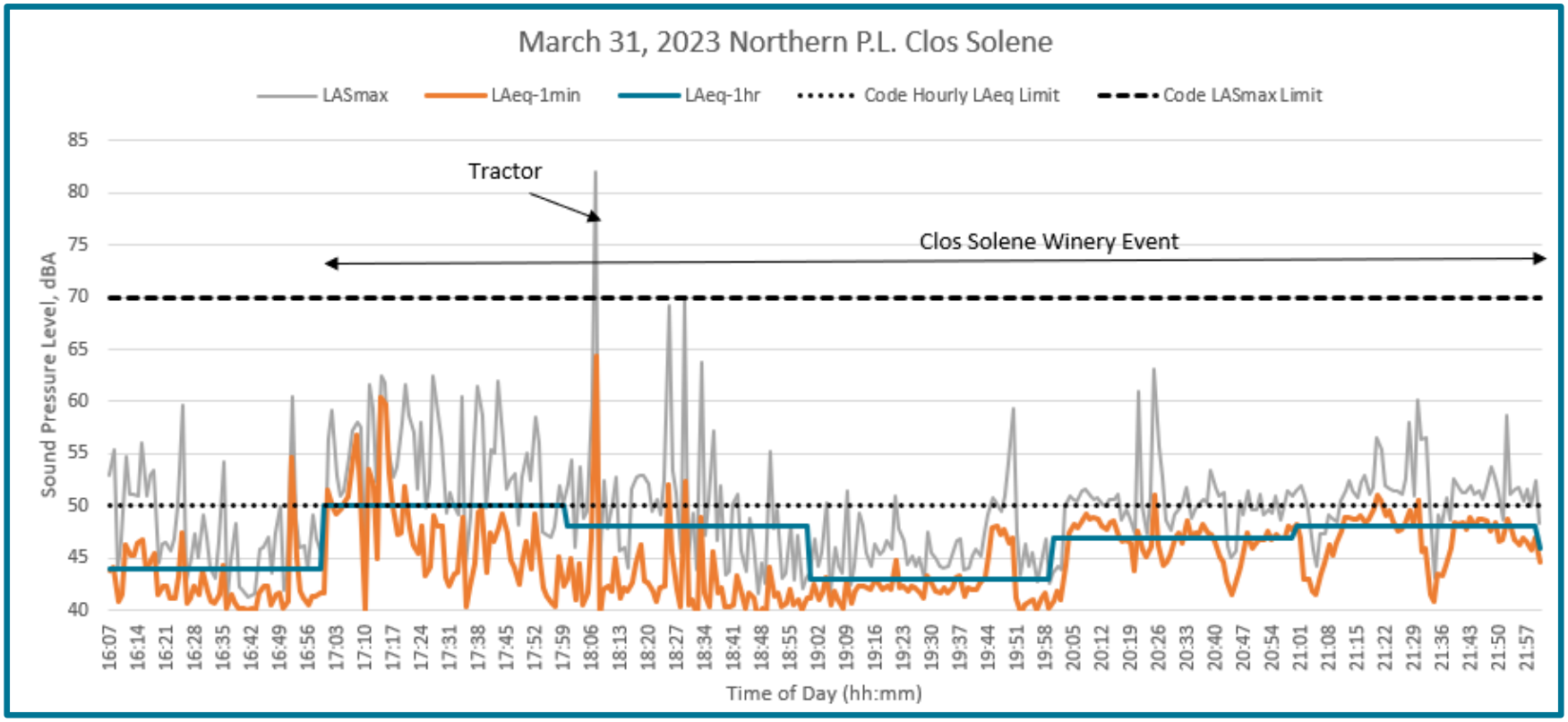


Figure 7: 1-hour and 1-min Equivalent Sound Levels, at Club Activity Tent/Equipment Pad (LOC #2)

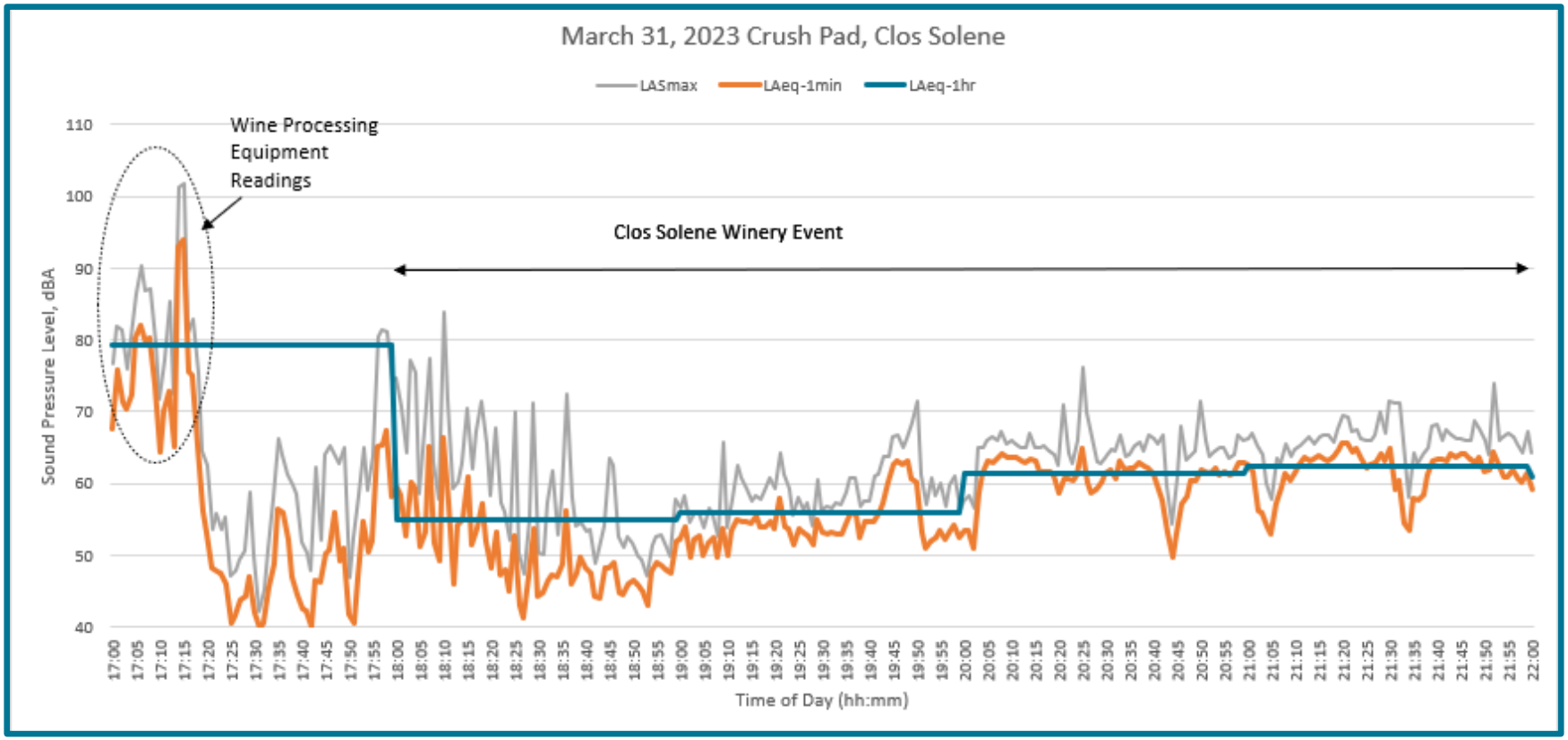


Figure 8: Photo 1 of wine production equipment measured on March 31, 2023

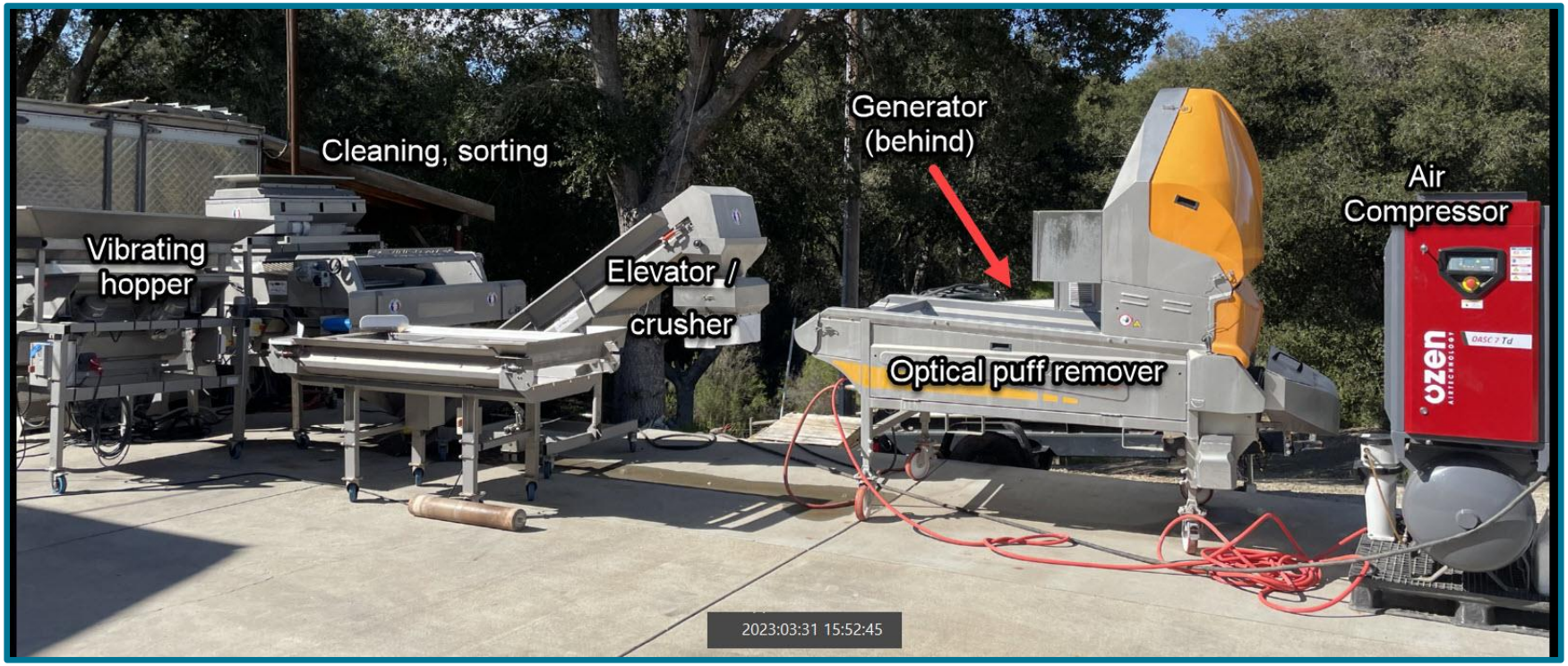


Figure 9: Photo 2 of equipment measured including generator in foreground, tent in background

Figure 10: Property Line representative receiver lcoations

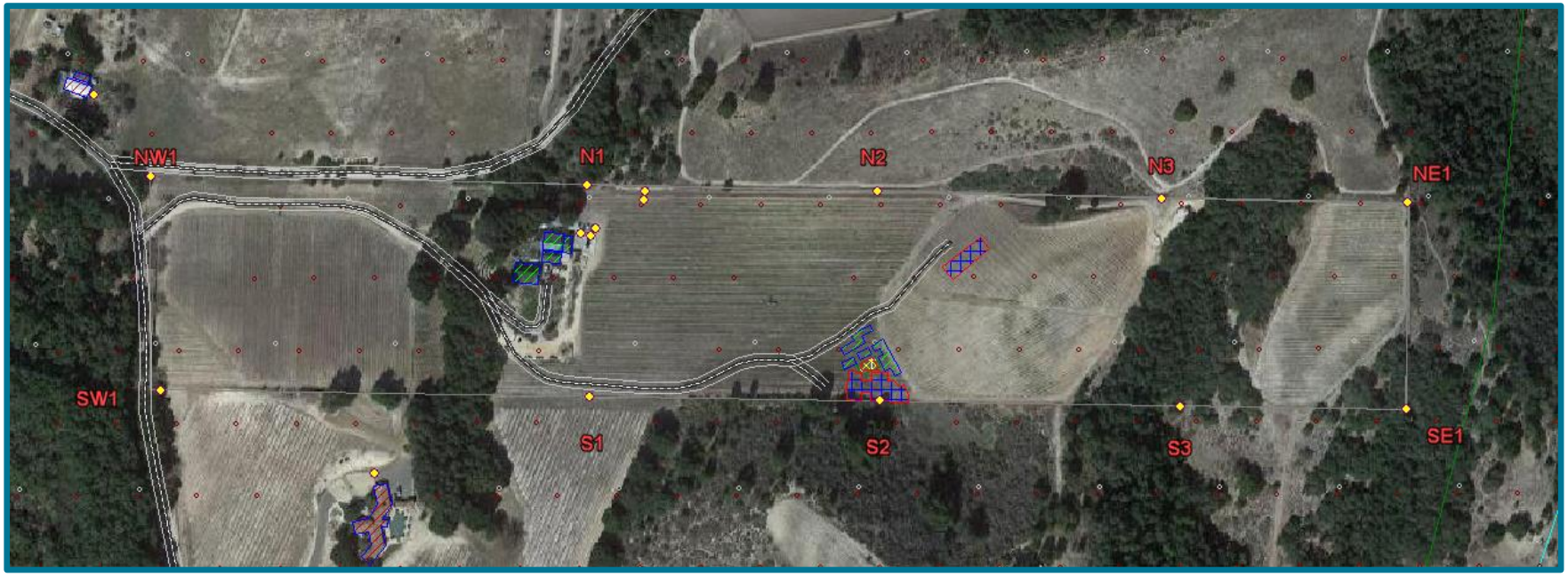


Figure 11: Daytime hourly "$L_{eq,d}$" Noise Contours for Wine Club Activity, with road traffic

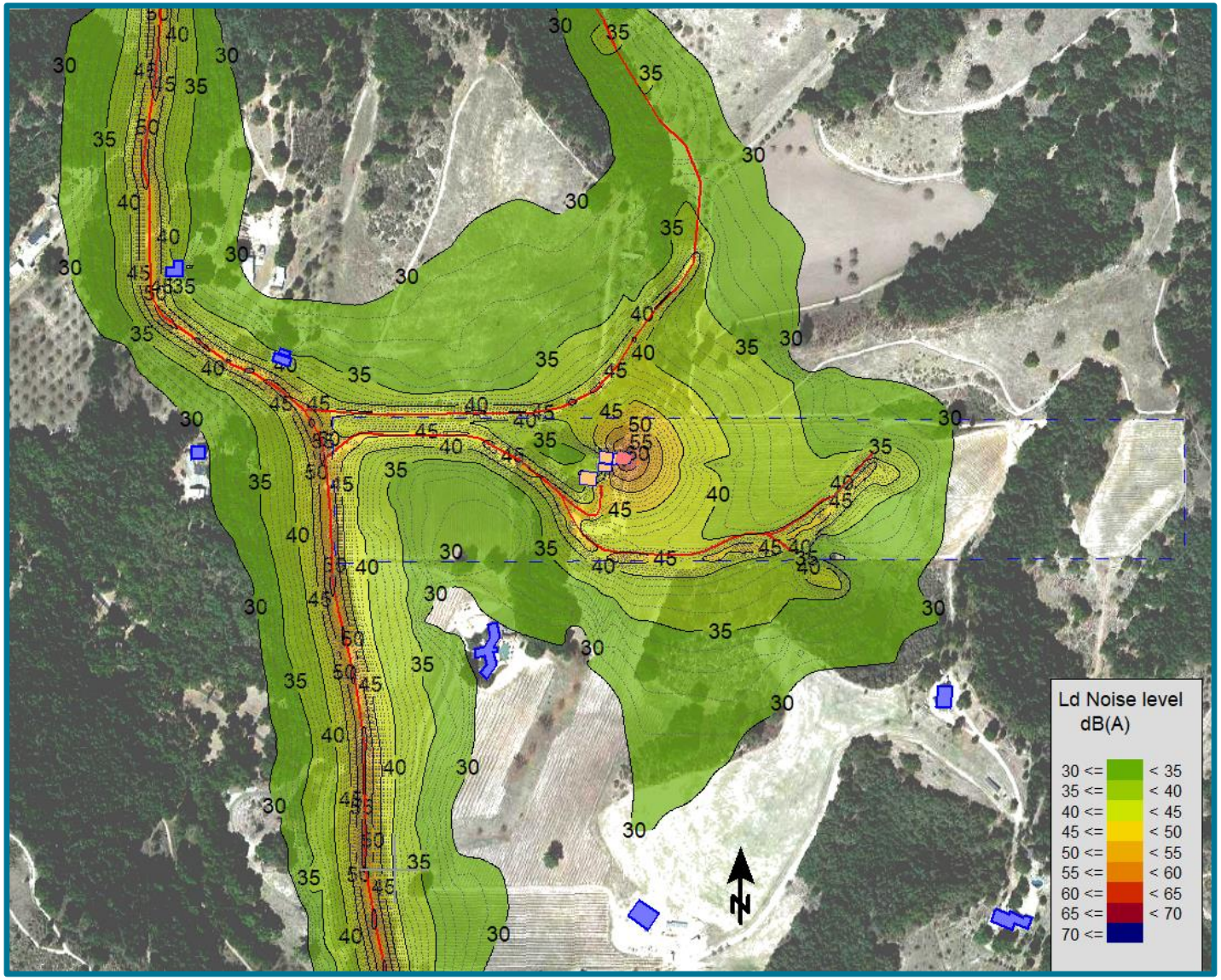


Figure 12: Daytime hourly "$L_{eq,d}$" Noise Contours for Wine Processing at Existing Pad, with road traffic

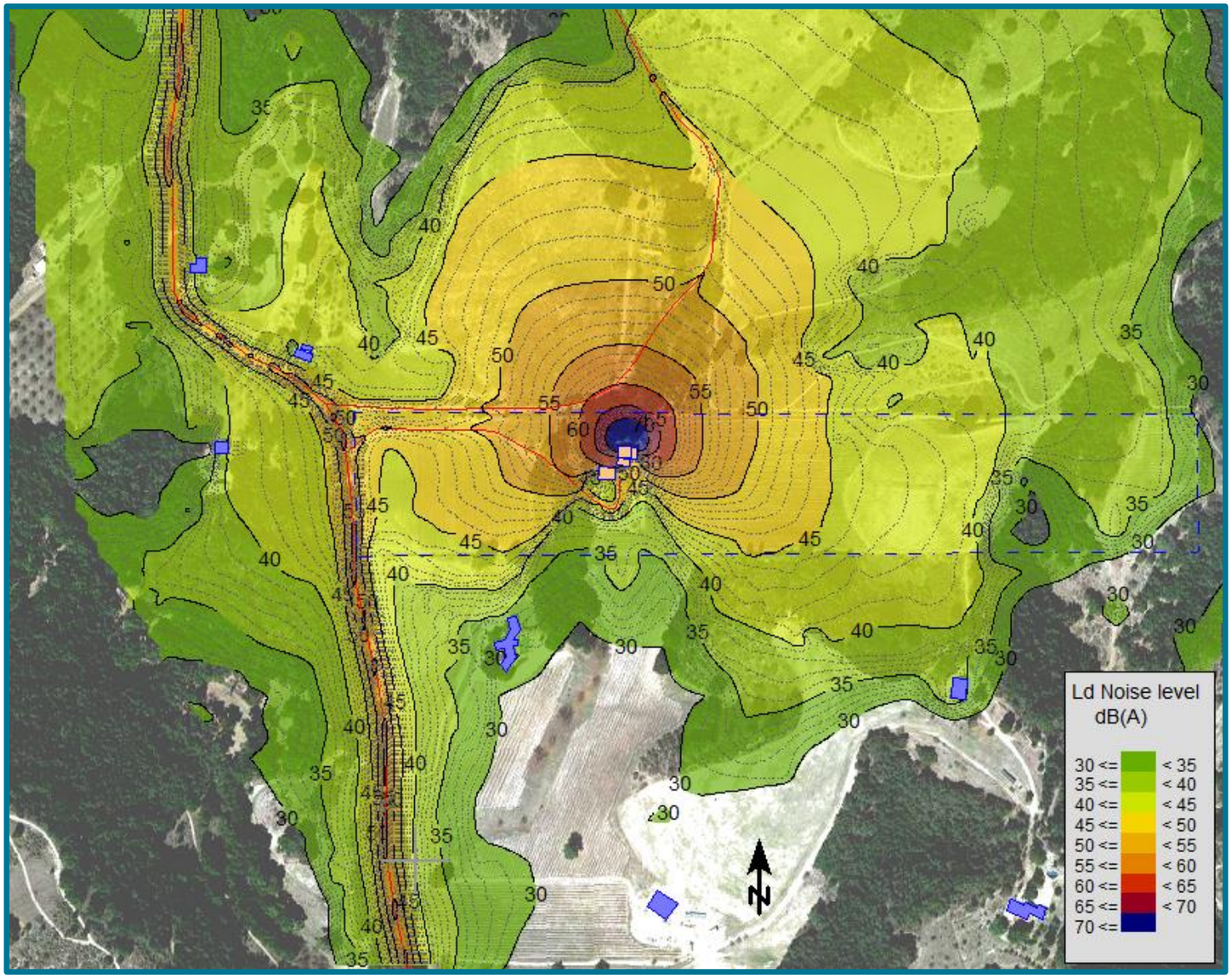


Figure 13: Daytime hourly "$L_{eq,d}$" Noise Contours for Proposed Wine Processing at New Pad, with road traffic

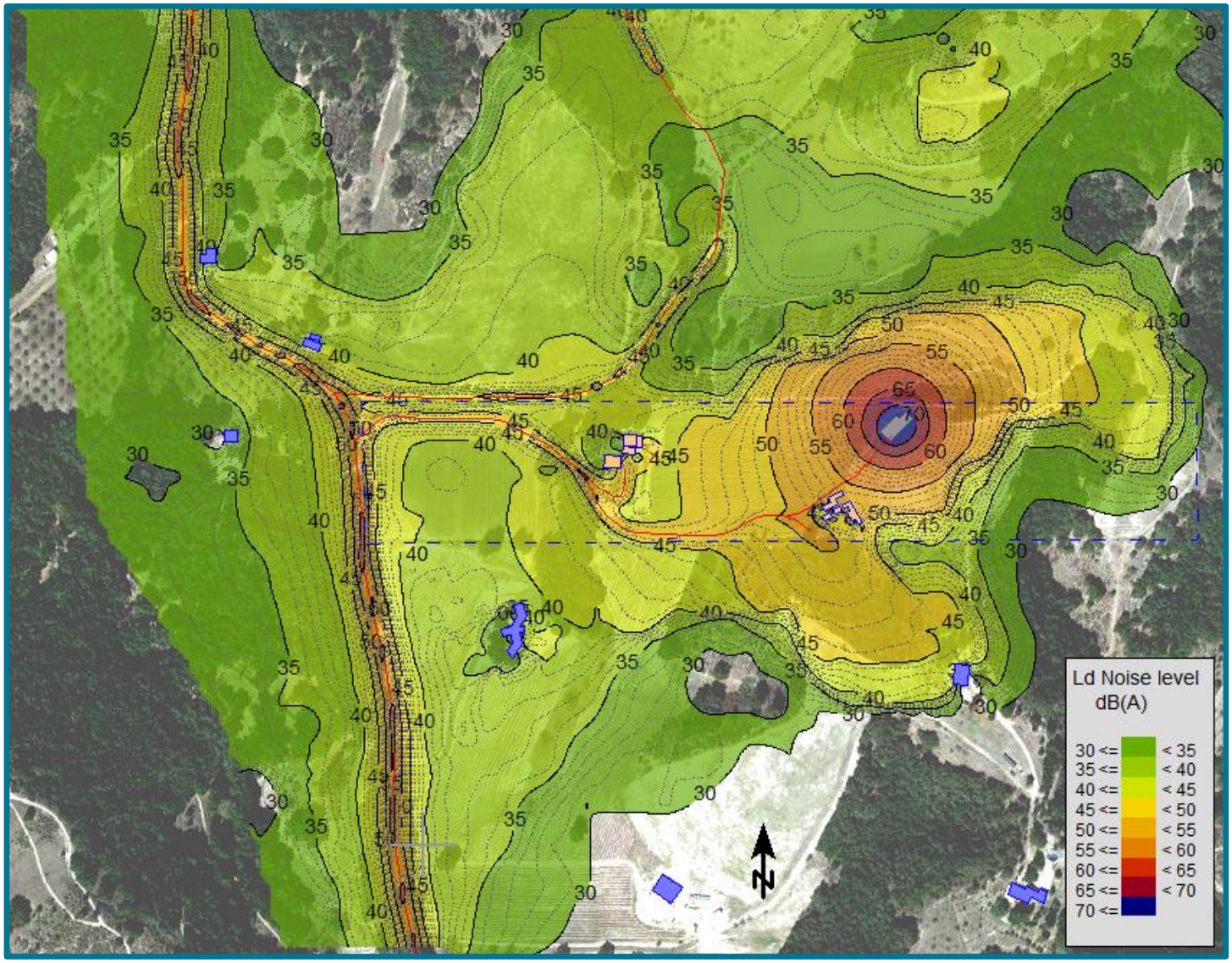
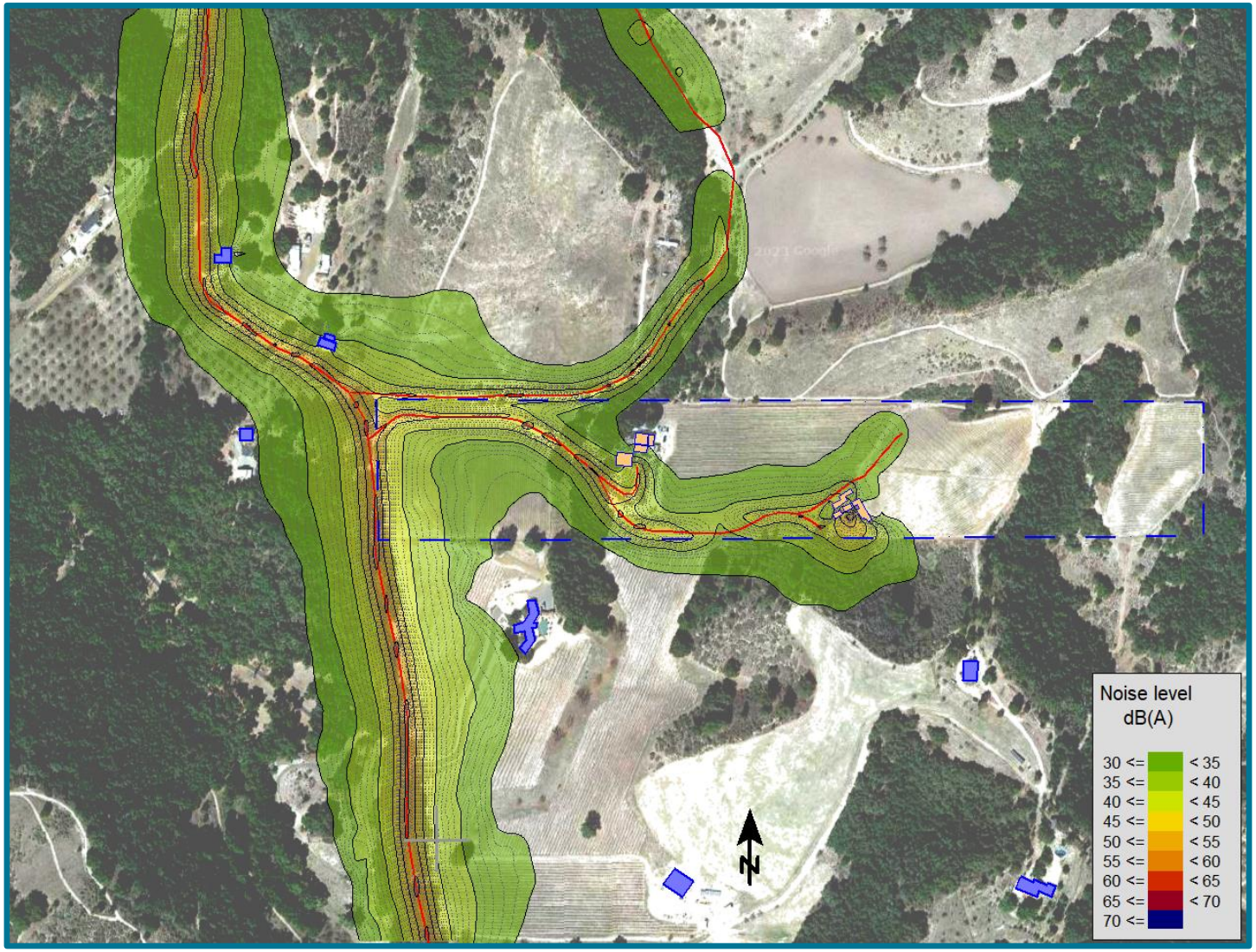


Figure 14: Daytime hourly "$L_{eq,d}$" Noise Contours for Proposed Outdoor Winery Activity, with road traffic



8 Appendix

8.1 Characteristics of Sound

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 to 140 dBA.

Table 7: Examples of Sound Pressure Levels

SPL (dBA)	Description
0	*The threshold of hearing.* This is the quietest sound that a child or young adult with good hearing can detect at 1kHz. (It is not silence.)
10 - 20	Very faint. A gentle breeze through the trees.
20 - 30	A soft whisper (at 1 meter).
30 - 40	A quiet auditorium.
40 - 60	Background music in a cafe, bar, or restaurant.
60 - 70	Typical conversation levels (from the listener's position).
70 - 80	The cabin of an aircraft during normal cruise conditions.
80 - 90	Typical wedding or dinner-dance band (typical audience position).
90 - 100	Loud orchestra (playing *fff*, as it would sound in the front row of the audience).
100 - 110	Typical disco.
110 - 115	A loud rock band (front rows of audience).
115 - 130	*Threshold of pain.* Often given as 120 dB SPL, this varies with frequency and from person to person.
140	Jet engine from 3 meters.

Examples of sound levels are listed on websites such as:

- "Time to Listen: Most Regular Patrons of Music Venues Prefer Lower Volumes" https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6438925/
- The Center for Hearing and Communication https://chchearing.org/noise/common-environmental-noise-levels/
- University of Michigan https://www.uofmhealth.org/health-library/tf4173

- https://www.researchgate.net/publication/328133495_Expected_Sound_Levels_at_Concert_Venues_for_Amplified_Music

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. Because of the physical characteristics of noise transmission and of noise perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 8 below presents the subjective effect of changes in sound pressure levels.

Table 8: Sound Level Change Relative to Loudness/Acoustic Energy Loss

0 dBA	Reference 0%
-3 dBA	Barely Perceptible Change 50%
-5 dBA	Readily Perceptible Change 67%
-10 dBA	Half as Loud 90%
-20 dBA	1/4 as Loud 99%
-30 dBA	1/8 as Loud 99.9%

Source: Highway Traffic Noise Analysis and Abatement Policy and Guidance, U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch, June 1995.

Sound levels are generated from a source and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss. Generally, sound levels from a point source will decrease by 6 dBA for each doubling of distance. Sound levels for a highway line source vary differently with distance because sound pressure waves propagate along the line and overlap at the point of measurement. A closely spaced, continuous line of vehicles along a roadway becomes a line source and produces a 3 dBA decrease in sound level for each doubling of distance. However, experimental evidence has shown that where sound from a highway propagates close to “soft” ground (e.g., plowed farmland, grass, crops, etc.), a more suitable drop-off rate to use is not 3.0 dBA but rather 4.5 dBA per distance doubling (FHWA 2010).

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. The L_{eq} is the most common parameter associated with such measurements. The L_{eq} metric is a single-number noise descriptor that represents the average sound level over a given period of time. For example, the L50 noise level is the level that is exceeded 50 percent of the time. This level is also the level that is exceeded 30 minutes in an hour. Similarly, the L02, L08 and L25 values are the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, State law requires that, for planning purposes, an artificial dB increment be added to quiet-time noise levels in a 24-hour noise descriptor called the CNEL or Ldn. This increment is incorporated in the calculation of CNEL or Ldn, described earlier.

8.2 Terminology/Glossary

A-Weighted Sound Level (dBA)
The sound pressure level in decibels as measured on a sound level meter using the internationally standardized A-weighting filter or as computed from sound spectral data to which A-weighting adjustments have been made. A-weighting de-emphasizes the low and very high frequency components of the sound in a manner similar to the response of the average human ear. A-weighted sound levels correlate well with subjective reactions of people to noise and are universally used for community noise evaluations.

Air-borne Sound
Sound that travels through the air, differentiated from structure-borne sound.

Ambient Sound Level
The prevailing general sound level existing at a location or in a space, which usually consists of a composite of sounds from many sources near and far. The ambient level is typically defined by the L_{eq} level.

Background Sound Level
The underlying, ever-present lower-level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as Traffic, typically make up the background. The background level is generally defined by the L90 percentile noise level.

Community Noise Equivalent Level (CNEL)
The L_{eq} of the A-weighted noise level over a 24-hour period with a 5 dB penalty applied to noise levels between 7 p.m. and 10 p.m. and a 10 dB penalty applied to noise levels between 10 p.m. and 7 a.m. CNEL is similar to L_{dn}.

Day-Night Sound Level (L_{dn})
The L_{eq} of the A-weighted noise level over a 24-hour period with a 10 dB penalty applied to noise levels between 10 p.m. and 7 a.m. L_{dn} is similar to CNEL.

Decibel (dB)
The decibel is a measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power, sound intensity) with respect to a reference quantity.

dBA or dB(A)
A-weighted sound level. The ear does not respond equally to all frequencies and is less sensitive at low and high frequencies than it is at medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.

Energy Equivalent Level (L_{eq})
Because sound levels can vary markedly in intensity over a short period of time, some method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, one describes ambient sounds in terms of an average level that has the same acoustical energy as the summation of all the time-varying event. This energy-equivalent sound/noise descriptor is called L_{eq}. In this report, an hourly period is used.

Percentile Sound Level, Ln
The noise level exceeded during *n* percent of the measurement period, where *n* is a number between 0 and 100 (e.g., L10 or L90)

Sound Transmission Class (STC)
STC is a single number rating, specified by the American Society for Testing and Materials, which can be used to measure the sound insulation properties for comparing the sound transmission capability, in decibels, of interior building partitions for noise sources such as speech, radio, and television. It is used extensively for rating sound insulation characteristics of building materials and products.

Structure-Borne Sound
Sound propagating through building structure. Rapidly fluctuating elastic waves in gypsum board, joists, studs, etc.

Sound Exposure Level (SEL)
SEL is the sound exposure level, defined as a single number rating indicating the total energy of a discrete noise-generating event (e.g., an aircraft flyover) compressed into a 1-second time duration. This level is handy as a consistent rating method that may be combined with other SEL and L_{eq} readings to provide a complete noise scenario for measurements and predictions. However, care must be taken in the use of these values since they may be misleading because their numeric value is higher than any sound level which existed during the measurement period.

Sound Pressure Level (SPL)
The local pressure deviation from the ambient (average or equilibrium) atmospheric pressure, caused by a sound wave. A quantification of sound level at the location of a listener, from any/all sound sources as experienced at one location. sound pressure is the distance-dependent effect of a sound source at a distance.

Sound Power Level (L_W, L_{WA})

The sound power, or acoustic power, is the sound energy constantly transferred per second from the sound source. A sound source has a given constant sound power that does not change if it is placed in a different environment. Sound power is a theoretical value that is not measurable. It is calculated and expressed in watts and as sound power level LW in decibels, LWA if A-weighted.

Subjective Loudness Level
In addition to precision measurement of sound level changes, there is a subjective characteristic which describes how most people respond to sound:

- A change in sound level of 3 dBA is *barely perceptible* by most listeners.
- A change in level of 6 dBA is *clearly perceptible*.
- A change of 10 dBA is perceived by most people as being *twice (or half)* as loud.

8.3 SoundPLAN Acoustics Software

SoundPLAN®, the software used for this acoustic analysis, is an acoustic ray-tracing program dedicated to the prediction of noise in the environment. Noise emitted by various sources propagates and disperses over a given terrain in accordance with the laws of physics. The software calculates sound attenuation of environmental noise, even over complex terrain, uneven ground conditions, and with complex obstacles. Up to three reflections for each noise source are taken into account to closely and accurately predict real-world acoustics. Worldwide,

governments and engineering associations have created algorithms to calculate acoustical phenomena to standardize the assessment of physical scenarios. Accuracy has been validated in published studies to be + / - 2.7 dBA with an 85% confidence level, for a wide variety of large-scale models and situations.

8.4 ISO 9613-2

For industrial and other noise sources besides road traffic, SoundPLAN calculates the sound field in accordance with ISO 9613-2 “Acoustics - Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation.” The standard states that “this part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors, in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.” Uncertainty of calculations with this method are +/-1 dB for sources less than 10m in height and within 1000m of the receiver.

8.5 Traffic Noise Model (TNM)

The Federal Highway Administration Traffic Noise Model (TNM), implemented into the SoundPLAN® software, was used for the road traffic sound level modeling in this study. TNM contains the following components:

1. Modeling of five standard vehicle types, including automobiles, medium trucks, heavy trucks, buses, and motorcycles, as well as user-defined vehicles.
2. Modeling both constant- and interrupted-flow traffic using a field-measured data base.
3. Modeling effects of different pavement types, as well as the effects of graded roadways.
4. Sound level computations based on a one-third octave-band data base and algorithms.
5. Graphically-interactive noise barrier design and optimization.
6. Attenuation over/through rows of buildings and dense vegetation.
7. Multiple diffraction analysis.
8. Parallel barrier analysis.
9. Contour analysis, including sound level contours, barrier insertion loss contours, and sound-level difference contours.

These components are supported by a scientifically founded and experimentally calibrated acoustic computation methodology, as well as a flexible data base, made up of over 6000 individual measured pass-by events.