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Wastewater Feasibility Study

Hourglass Winery Use Permit Major Modification (P19-00102-MOD),
Viewshed (P23-00278-VIEW), Exception to Con. Regs. (P23-00279-
UP), and Exception to the Road and Street Standards
Planning Commission Hearing Date February 4, 2026



February 3, 2023

Job No. 19-129

Kim Withrow, REHS
Environmental Health Division
Napa County Planning, Building and Environmental Services Department
1195 Third Street, Suite 210
Napa, CA 94559

Re: Onsite Wastewater Disposal Feasibility Study for the
Hourglass Use Permit Modification Application (P19-00102)
701 Lommel Road, Calistoga, California APNs 018-060-024 & 021-010-001

Dear Ms. Withrow:

At the request of Hourglass Winery, we have evaluated the process and sanitary wastewater flows associated with the proposed Use Permit Modification. We have also analyzed the capacity of the existing process and sanitary wastewater system serving the winery facility to determine if it is adequate to serve the proposed changes in use.

The Use Permit Modification application under consideration proposes the following characteristics:

- Wine Production:
 - 60,000 gallons of wine per year
 - Crushing, fermenting, aging and bottling
- Employees:
 - 10 full-time employees
 - 2 part-time employees
- Marketing Plan:
 - Daily Tours and Tastings by Appointment
 - 20 visitors per day maximum

- Private Marketing Events – Type 1
 - 30 guests maximum
 - 54 events per year
 - Food prepared offsite by catering company,
- Private Marketing Events – Type 2
 - 100 guests maximum
 - 1 event per year
 - Food prepared offsite by catering company
 - Portable toilets used for all events with more than 30 guests
- Private Marketing Events – Type 3
 - 250 guests maximum
 - 3 events per year
 - Food prepared offsite by catering company
 - Portable toilets used for all events with more than 30 guests
- Private Marketing Events – Type 4
 - 500 guests maximum
 - 1 event per year
 - Food prepared offsite by catering company
 - Portable toilets used for all events with more than 30 guests

Existing improvements on the property include the winery and agricultural buildings, vineyards, caves and the related access and utility infrastructure. A new hospitality building and cave expansion is proposed as part of the Use Permit Modification. Please see the Hourglass Winery Site Plan Exhibit by Albion Surveys for approximate locations of existing and proposed facilities.

The remainder of this letter describes the existing process and sanitary wastewater disposal system, its design capacity, peak flows associated with the proposed changes in use and our analysis and recommendations related to the system's capability to handle the anticipated wastewater flows.

Existing Septic System

The winery facility is serviced by one combined domestic and process waste septic system. According to permit records on file with Napa County (E08-00380) the septic system is a conventional gravity distribution type system that was installed in between August 2008 and December 2008. The system was designed to serve a 30,000 gallon per year winery with a peak flow of 1,000 gallons per day (gpd) of process wastewater, 165 (gpd) of winery sanitary wastewater and a four bedroom residence with a design flow of 600 (gpd). The total design flow is 1,765 gpd.

Based on our review of the permit records it appears that the existing septic system is comprised of one 5,000 gallon process waste septic tank, one 1,200 gallon SS septic tank, and 1,800 LF of leach lines. The system was designed based on a soil application rate of 0.33 gpd/sf of trench

sidewall. Trenches were designed based on 3 sf of sidewall per lineal foot of trench. The trenches were designed such that they would have 36 inches of acceptable soil beneath the trench bottom.

The septic tanks are located just southeast of the winery building and the leach field is located southeast of the tanks, within the vineyard as shown on the Hourglass Winery Site Plan Exhibit prepared by Albion Surveys.

Proposed Process Wastewater Design Flows

We have used the generally accepted standard that six gallons of winery process wastewater are generated for each gallon of wine that is produced each year and that 1.5 gallons of wastewater are generated during the crush period for each gallon of wine that is produced. Based on the 60,000 gallon production capacity and the expectation that both white and red wine will be produced at the winery, we have assumed a 60 day crush period. Using these assumptions, the annual, average daily and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{60,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

$$\text{Annual Winery Process Wastewater Flow} = 300,000 \text{ gallons per year}$$

$$\text{Average Daily Process Wastewater Flow} = \frac{360,000 \text{ gallons wastewater}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

$$\text{Average Daily Winery Process Wastewater Flow} = 986 \text{ gallons per day}$$

$$\text{Peak Winery Process Wastewater Flow} = \frac{60,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{60 \text{ crush days}}$$

$$\text{Peak Winery Process Wastewater Flow} = 1,500 \text{ gallons per day (gpd)}$$

Proposed Winery Sanitary Wastewater Design Flows

The peak sanitary wastewater flow from the winery is calculated based on the number of winery employees, the number of daily visitors for tastings and the number of guests attending scheduled marketing events. In accordance with Table 4 of the Napa County “Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems” we have used a design flow rate of 15 gallons per day per employee and 3 gallons per day per visitor for tastings. Table 4 does not specifically address design wastewater flows for guests at marketing events. Since the applicant is proposing that food will be prepared onsite for events with up to 30 guests, we have used a design flow of 15 gallons per guest similar to a restaurant. For larger events portable toilets will be used and therefore they are not evaluated here. Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

Employees

Peak Sanitary Wastewater Flow = 12 employees X 15 gpd per employee

Peak Sanitary Wastewater Flow = 180 gpd

Daily Tastings

Peak Sanitary Wastewater Flow = 20 visitors per day X 3 gallons per visitor

Peak Sanitary Wastewater Flow = 60 gpd

Marketing Event – Type I

Peak Sanitary Wastewater Flow = 30 guests X 15 gallons per guest

Peak Sanitary Wastewater Flow = 450 gpd

Marketing Event – Type 2, 3 & 4

Portable toilets will be used for these events and therefore they are not included in the peak flow calculations.

Total Peak Winery Sanitary Wastewater Flow

In order to manage the peak sanitary wastewater flows to the disposal field portable toilets will be used for all events with more than 30 guests in attendance as previously described. Furthermore no more than one marketing event will be held on any given day. Therefore, the worst case peak winery sanitary wastewater flow is calculated based on 12 employees, 30 visitors and a marketing event for 30 people with a meal prepared. The peak flow for these scenarios is calculated as follows:

Total Peak Winery Sanitary Wastewater Flow = 180 gpd + 60 gpd + 450 gpd = 690 gpd

Combined Peak Wastewater Flow

Combined Peak Wastewater Flow = Peak Winery Process Wastewater Flow + Total Peak Winery Sanitary Wastewater Flow

Combined Peak Winery Wastewater Flow = 1,500 gpd + 690 gpd = 2,190 gpd

Existing Septic System Capacity

As noted above the permit for the existing system indicates a design flow of 1,765 gpd.

Proposed Design Flow vs Existing Capacity

The predicted Combined Peak Winery Wastewater Flow for the proposed winery operational characteristics (2,190 gpd) is more than the design capacity of the existing wastewater disposal system (1,765 gpd).

Recommendations

There are several possible options for expanding the capacity of the existing septic system to serve the proposed operational needs. Adding four new leach lines at 100 LF each would bring the design capacity to 2,200 gpd. However, new State requirements will dictate that the process wastewater be pre-treated before being disposed of in the leach field.

Given the requirement for pretreatment there is also an alternative solution which includes handling the process and domestic waste streams separately. The domestic waste could continue to go to the existing leach field since the peak flows (690 gpd) are less than the 1,765 gpd design capacity for the existing leach field. The process waste in this scenario would be pretreated to land application strength requirements (160 mg/l BOD and 80 mg/l TSS) and surface irrigated to approximately 2 acres of vineyard located southwest of the winery development area.

Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that the primary system fails or the soil in the primary area is otherwise rendered unsuitable for wastewater disposal. The reserve area would need to account for 690 gpd of flow for winery domestic waste. One half of the existing leach field could be disconnected and saved for use as the required reserve area.

Pretreatment Irrigation Storage Tank Capacities

Additional pretreatment will be required to re-use the winery process wastewater for vineyard irrigation. Furthermore, a storage tank will be required to hold the treated water during periods that it cannot be applied to the vineyard. A water balance was prepared (attached) and we recommend a minimum storage volume of approximately 25,000 gallons to provide operational flexibility. The details of the pretreatment system and irrigation storage tank will be fully detailed on future construction permit submittals after Use Permit Modification approval.

Summary

The calculations presented above illustrate that the wastewater flows associated with the proposed Use Permit Modification can be handled onsite. Full design details of the required upgrades will be submitted for your review as part of the building permit and sewage permit process.

We trust that this provides the information you need to process the subject Use Permit Modification. Please feel free to contact us at (707) 320-4968 if you have any questions.
Sincerely,

Applied Civil Engineering Incorporated

By:

Michael R. Muelrath

Michael R. Muelrath RCE 67435
Principal



Copy:

Jeff Smith, Hourglass Winery (via email)
John Webb, Albion Surveys (via email)

Enclosures:

Hourglass Winery Site Plan Exhibit by Albion Surveys
Water Balance Spreadsheet

Irrigation Storage Tank Water Balance

Month	Beginning Balance	Process Wastewater	Land Application Capacity	Ending Balance
January	0	25,200	43,444	0
February	0	18,000	43,444	0
March	0	18,000	43,444	0
April	0	14,400	43,444	0
May	0	14,400	32,608	0
June	0	25,200	81,519	0
July	0	36,000	81,519	0
August	0	46,800	48,912	0
September	0	46,800	48,912	0
October	0	54,000	32,608	21,392
November	21,392	36,000	43,444	13,948
December	13,948	25,200	43,444	0
		360,000	586,741	

Notes:

1. All values shown above for beginning balance, inflow, outflow and ending balance are in units of gallons.
2. See attached tables for detailed explanation of process wastewater and irrigation data presented in this table.
3. This water balance is based on the assumption that the tank is empty in August, just prior to crush.
4. This table is intended to illustrate waste disposal capability only. Where irrigation demand exceeds available treated wastewater availability additional irrigation water will be provided by another source.

Winery Process Wastewater Generation Analysis

Annual Wine Production	60,000 gallons
Wastewater Generation Rate	6 gallons per gallon of wine
Annual Wastewater Generation	360,000 gallons
Crush Season Length	60 days
Wastewater Generated During Crush	1.5 gallons per gallon of wine
Peak Wastewater Generation Rate	1,500 gallons per day

Winery Process Wastewater Generation Table			
Month	Percentage of Annual Total	Monthly Flow (gallons)	Average Flow (gpd)
January	7.0%	25,200	813
February	5.0%	18,000	643
March	5.0%	18,000	581
April	4.0%	14,400	480
May	4.0%	14,400	465
June	7.0%	25,200	840
July	10.0%	36,000	1,161
August	13.0%	46,800	1,510
September	13.0%	46,800	1,560
October	15.0%	54,000	1,742
November	10.0%	36,000	1,200
December	7.0%	25,200	813
Total	100.0%	360,000	

Notes:

- I. Wastewater generation rates and monthly proportioning are based on our past experience with similar projects.

Irrigation Schedule Analysis

Vineyard Information:

Total acres of vines	2 acres
Vine Row Spacing (approx)	7 feet
Vine Spacing (approx)	5 feet (estimated)
Vine density	1,245 vines per acre (estimated)
Total Vine Count	2,489 vines

Irrigation Information:

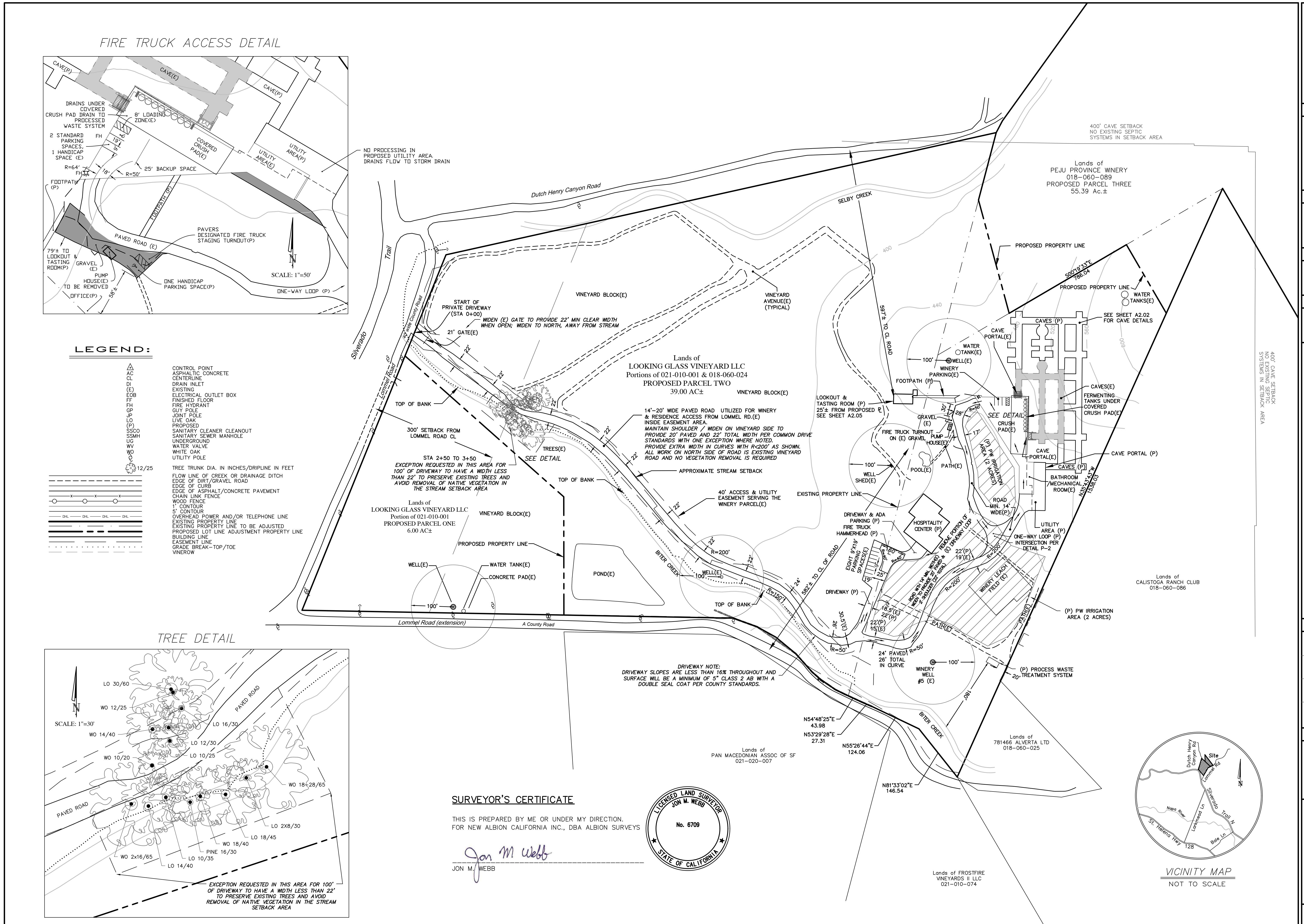
Seasonal Irrigation¹ 131.0 gallons per vine (May through October)

Non-Irrigation Application 0.8 inches per month October through April

Irrigation Schedule					
Month	Monthly Percentage ²	Irrigation per Vine (gallons)	Seasonal Irrigation (gallons)	Non-Seasonal Irrigation Application (gallons)	Total (gallons)
January		0.0	0	43,444	43,444
February		0.0	0	43,444	43,444
March		0.0	0	43,444	43,444
April		0.0	0	43,444	43,444
May	10%	13.1	32,608	0	32,608
June	25%	32.8	81,519	0	81,519
July	25%	32.8	81,519	0	81,519
August	15%	19.7	48,912	0	48,912
September	15%	19.7	48,912	0	48,912
October	10%	13.1	32,608	0	32,608
November		0.0	0	43,444	43,444
December		0.0	0	43,444	43,444
Total	100%	131.0	326,078	260,663	586,741

Notes:

1. Irrigation per vine is based on 0.5 acre-feet per acre of vines per WAA.
2. Monthly vineyard irrigation percentages are based on our past experience with projects of this type.
3. Non-Irrigation Application is for managing tank levels and assumes a maximum of 5 operational days per month based on historic weather data (Summit Engineering NBRID Capacity Study, 1996) and a saturated soil infiltration rate of 0.1 gallons per square foot per day uniformly over the entire area.



DRAWING NOTES

THIS MAP IS NOT A BOUNDARY SURVEY.
IT IS PROVIDED TO LOCATE THE PROPOSED SUBJECT PROPERTY IN RELATION TO ADJACENT LANDS, HIGHWAYS, ROADS, STREETS AND NOT TO GUARANTEE ANY FIXED DIMENSION OR AGREEMENT.
A FIELD SURVEY SHOULD BE PERFORMED PRIOR TO ANY CONSTRUCTION OR CONVEYANCE.
OTHER EASEMENTS MAY AFFECT THIS PROPERTY. THIS SURVEY WAS NOT PROVIDED ANY ADDITIONAL INFORMATION REGARDING EASEMENTS BY THE OWNER.

SITE INFORMATION

APN: 018-060-024 & 021-010-001
STREET: 701 LOMMEL ROAD
CITY: ST. HELENA
SITE CONTACT: JEFF SMITH
PHONE: 968-9332, CELL 484-9333

ARCHITECT
COMPANY: LUNDBERG DESIGN
CONTACT: MICHELLE KRIEBEL
EMAIL: MICHELLE@LUNDBERGDESIGN.COM

ENGINEER
COMPANY: APPLIED CIVIL
CONTACT: MIKE MUELRATH
EMAIL: MIKE@APPLIEDCIVIL.COM

WINERY USE PERMIT MAP
FOR THE LANDS OF
HOURGLASS WINERY & 9 BUTTONS VINEYARD LLC
COUNTY OF NAPA STATE OF CALIFORNIA

REVISIONS & ADDITIONS

DATE: AUGUST 10, 2006
FIELD BOOK NO: NA
PAGE(S): NA
DRAWN BY: R. CANNON
DATE: SEPTEMBER 25, 2019
FIELD BOOK NO: NA
PAGE(S): NA
DRAWN BY: R. MATTERI
DATE: DECEMBER 6, 2022
FIELD BOOK NO: NA
PAGE(S): NA
DRAWN BY: M. GARRETT
DATE: FEBRUARY 15, 2023
DRAWN BY: M. BELL

ALBION REFERENCES

PROJECT NO: 2166
ASSOCIATED DWG(S):
PROJECT MANAGER: JON WEBB
ORIGINAL FIELD BOOK NO:
DATE:

VICINITY MAP
NOT TO SCALE

SCALE: 1"=100'
CONTOUR INTERVAL=40'
VERTICAL DATUM ON NAPA COUNTY GIS.
DIRECTION OF NORTH BASED ON
A COMPASS SIGHTING.

SHEET I
C3D PROJECT 2166
DWG 2166-II USE