

“K”

Wastewater Feasibility Study



February 26, 2016

Job No. 14-102

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

Re: Sodhani Winery Onsite Wastewater Disposal Feasibility Study Supplemental Information
3283 St. Helena Highway, St. Helena, CA 94574 APN 022-080-004 (P14-00402)

Dear Ms. Withrow:

The Onsite Wastewater Disposal Feasibility Study for the Sodhani Winery prepared by this office, dated December 5, 2014 was submitted with the original Use Permit application package. That report outlined two options for wastewater disposal. Option 1 is Sanitary Wastewater Subsurface Drip Disposal Field and Process Wastewater Hold and Haul. Option 2 is Sanitary Wastewater Subsurface Drip Disposal Field and Process Wastewater Pretreatment for Irrigation.

The purpose of this letter is to present a third option for onsite wastewater disposal as outlined below:

Option #3 Sanitary and Process Wastewater Subsurface Drip Disposal Field

In this scenario the sanitary and process wastewater streams from the winery and residence would be combined, pretreated and disposed of via a subsurface drip disposal field similar to the disposal field described in Option #1 and Option #2 in the original report.

Required Disposal Field Area

The disposal field area is calculated based upon the design hydraulic loading rate for the soil conditions and the proposed design flow. Since the slope of the natural ground surface in the area of the proposed disposal field is more than 20% a 150% adjustment factor is required to accommodate for the steep slopes. The system must accommodate the peak flow from the winery sanitary wastewater (60 gpd), the winery process wastewater (600 gpd) and residential sanitary wastewater (300 gpd) for a total of 960 gpd. Based on these design parameters, the required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Require Disposal Field Area} = \frac{960 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

Required Disposal Field Area = 2,400 square feet

Available Disposal Field Area

Based on the proposed site layout and topographic data prepared by Albion Surveys, we have determined that there is enough area to install approximately 2,400 square feet of subsurface drip disposal field in the vicinity of Test Pits #6 & #7. The conceptual layout of the disposal field is shown on the Sodhani Winery Use Permit Conceptual Site Plans attached to this letter.

Pretreatment and Septic Tank Capacity

Pretreatment must be provided to treat the sanitary and process wastewater to meet Napa County pretreated effluent standards (BOD < 30 mg/l, TSS < 30 mg/l). There are several options for pretreatment systems that are available to meet this requirement. The Applicant and the Engineer will review options and select a suitable pretreatment system designed to meet this requirement prior to application for a sewage permit for the winery. Septic tanks will be sized in accordance with the requirements of the selected pretreatment system.

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. For subsurface drip type septic systems the reserve area must be 200% of the size of the disposal field area. The required reserve area is calculated as follows:

$$\text{Required Reserve Area} = 200\% \times \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Require Reserve Field Area} = 200\% \times \frac{960 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

Required Reserve Area = 4,800 square feet

Based on the proposed site plan we have determined that there is enough area to set aside for an additional 4,800 square feet of subsurface drip disposal field in the vicinity of Test Pits #6 and #7 as shown on the Sodhani Winery Use Permit Conceptual Site Plans attached to this letter.

These calculations and the attached plans show that it is feasible to install an onsite subsurface drip disposal system that can accommodate both the sanitary and process wastewater flows on the property. We hereby request that this option be included in the Use Permit review process and that the Applicant and Engineer be allowed to select the preferred option at the time of building permit submittal.

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



Enclosures:

Sodhani Winery Use Permit Conceptual Site Plans

Copy:

Jason Hade, Napa County PB&ES – Planning Division
Arvind Sodhani
Donna Oldford, Plans 4 Wine

SODHANI WINERY

USE PERMIT CONCEPTUAL SITE PLANS



OVERALL SITE PLAN
SCALE: 1" = 40'



LOCATION MAP
SCALE: 1" = 1000'

PROJECT INFORMATION:

PROPERTY OWNER & APPLICANT:
AS VINEYARDS LLC
CARE OF: ARVIND SODHANI
85 71ST AVENUE
SAN FRANCISCO, CA 94121

SITE ADDRESS:
3183 ST. HELENA HIGHWAY NORTH
ST. HELENA, CA 94574
ASSESSOR'S PARCEL NUMBER:
032-080-004

PARCEL SIZE:
1.1 ± ACRES

PROJECT SIZE:
1.4 ± ACRES

ZONING:
AGRICULTURAL WATERSHED (AW)

DOMESTIC WATER SOURCE
ON-SITE WELLS

FIRE PROTECTION WATER SOURCE
STORAGE TANKS

WASTEWATER DISPOSAL
ON-SITE TREATMENT AND DISPOSAL

SHEET INDEX:

- CI OVERALL SITE PLAN
- C1 WINERY GRADING AND LAYOUT PLAN
- C2 CONCRETE FOUNDATION PLAN
- C3 IMPERVIOUS AREA EXHIBIT
- C4 STORMWATER CONTROL PLAN EXHIBIT
- C5 FLOOD HAZARD NOTE

FLOOD HAZARD NOTE
 ACCORDING TO THE FEDERAL FLOODING MANAGEMENT AGENCY (FFMA) APPROVED FLOOD HAZARD MAP FOR THE AREA, THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.

GRADING QUANTITIES*

TYPE	SIZE (CY)
FILL	500 ± CY
EXCAVATION	500 ± CY

* THIS ESTIMATE IS BASED ON THE PROPOSED GRADING AND LAYOUT PLAN. THE ESTIMATE IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS TO VERIFY THE OWNERS' DATA AND TO PROVIDE A DETAILED ESTIMATE OF GRADING QUANTITIES ABOVE. THIS ESTIMATE IS BASED ON IN PLACE VOLUMES AND DOES NOT INCLUDE FINING AGGREGATE OR SUBJECT VOLUMES.

NOTES:

1. MAJOR MICROCLIMATE, SURVEYING, TOPOGRAPHIC, GEOTECHNICAL, AND OTHER DATA HAS BEEN OBTAINED FROM A PORTION OF THE LAND ON 128 ST. HELENA HIGHWAY OWNED BY SODHANI LLC, DATED JUNE 20, 2014. APPLIED CIVIL ENGINEERING HAS CONDUCTED A TOPOGRAPHIC SURVEY OF THE PROJECT SITE AND THE ACCURACY OF THE TOPOGRAPHIC INFORMATION.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF SAN FRANCISCO'S GRADING REGULATIONS AND THE CALIFORNIA GRADING AND CONSTRUCTION ACT (CIVIL CODE SECTION 91000).
3. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF SAN FRANCISCO'S GRADING REGULATIONS AND THE CALIFORNIA GRADING AND CONSTRUCTION ACT (CIVIL CODE SECTION 91000).
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AGENCIES AND THE STATE OF CALIFORNIA.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AGENCIES AND THE STATE OF CALIFORNIA.



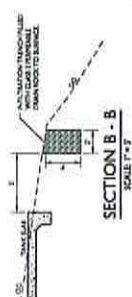
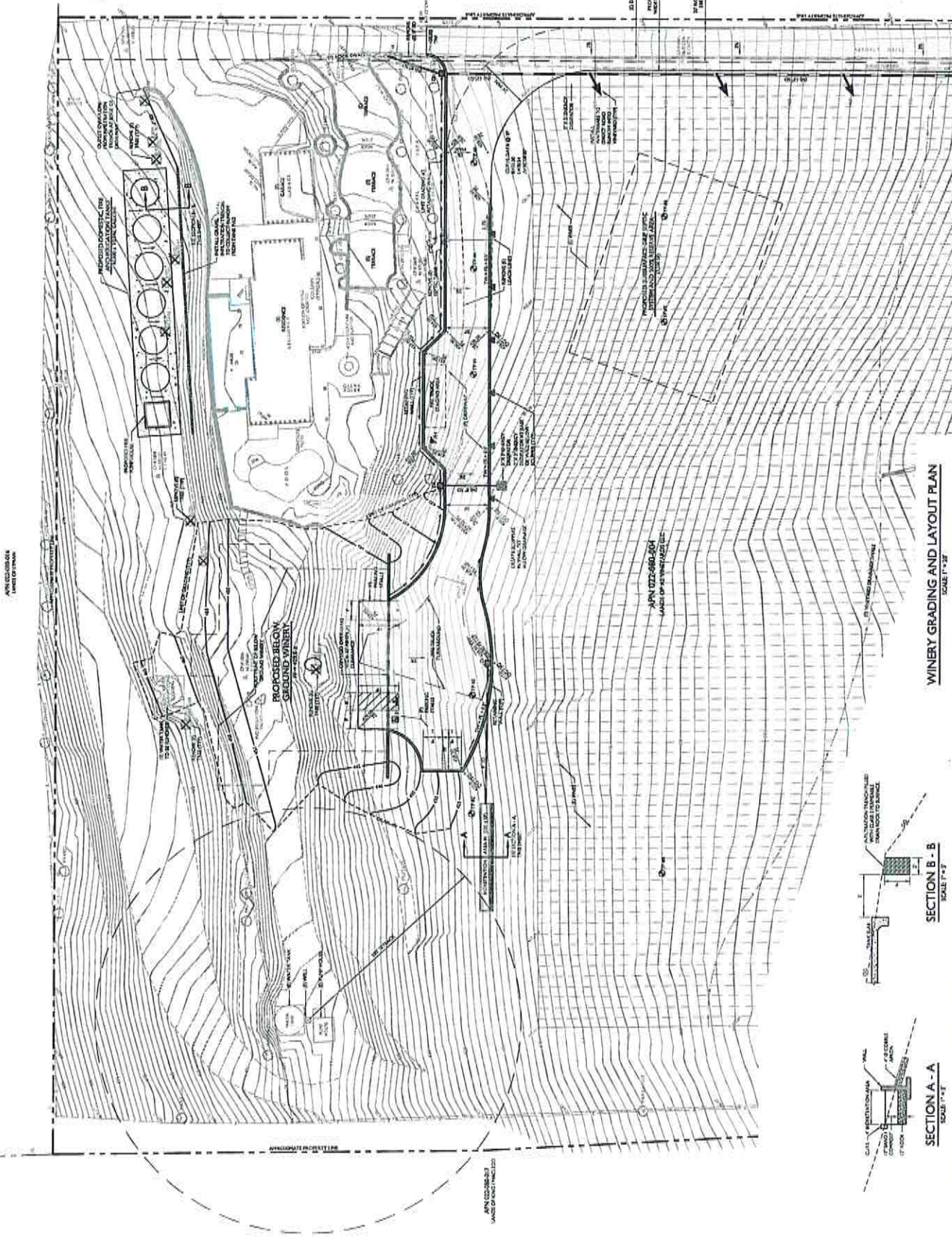
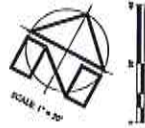
PREPARED UNDER THE
 DIRECTION OF



DESIGNED BY: [Name]
 CHECKED BY: [Name]
 DATE: MARCH 1, 2014
 EDITIONS: [Number]

JOB NUMBER: [Number]
 FILE: [Number]
 ORIGINAL DATE: [Date]
 SHEET NUMBER: [Number]

C2 of **5**



WINERY GRADING AND LAYOUT PLAN
 SCALE 1" = 30'

SECTION A - A
 SCALE 1" = 3'

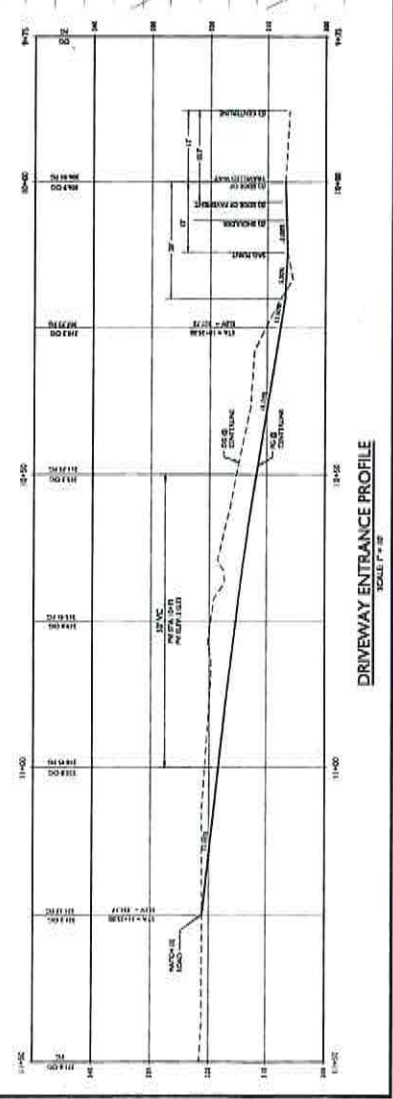
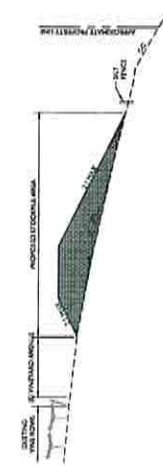
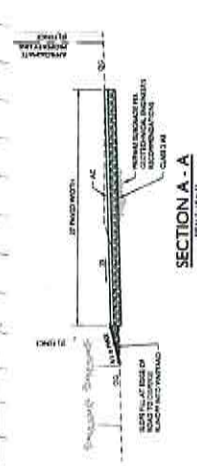
SECTION B - B
 SCALE 1" = 3'

PREPARED UNDER THE
 DIRECTION OF



DESIGNED BY: [Redacted]
 CHECKED BY: [Redacted]
 DATE: [Redacted]
 PROJECT NO.: [Redacted]
 EXTENSION: [Redacted]

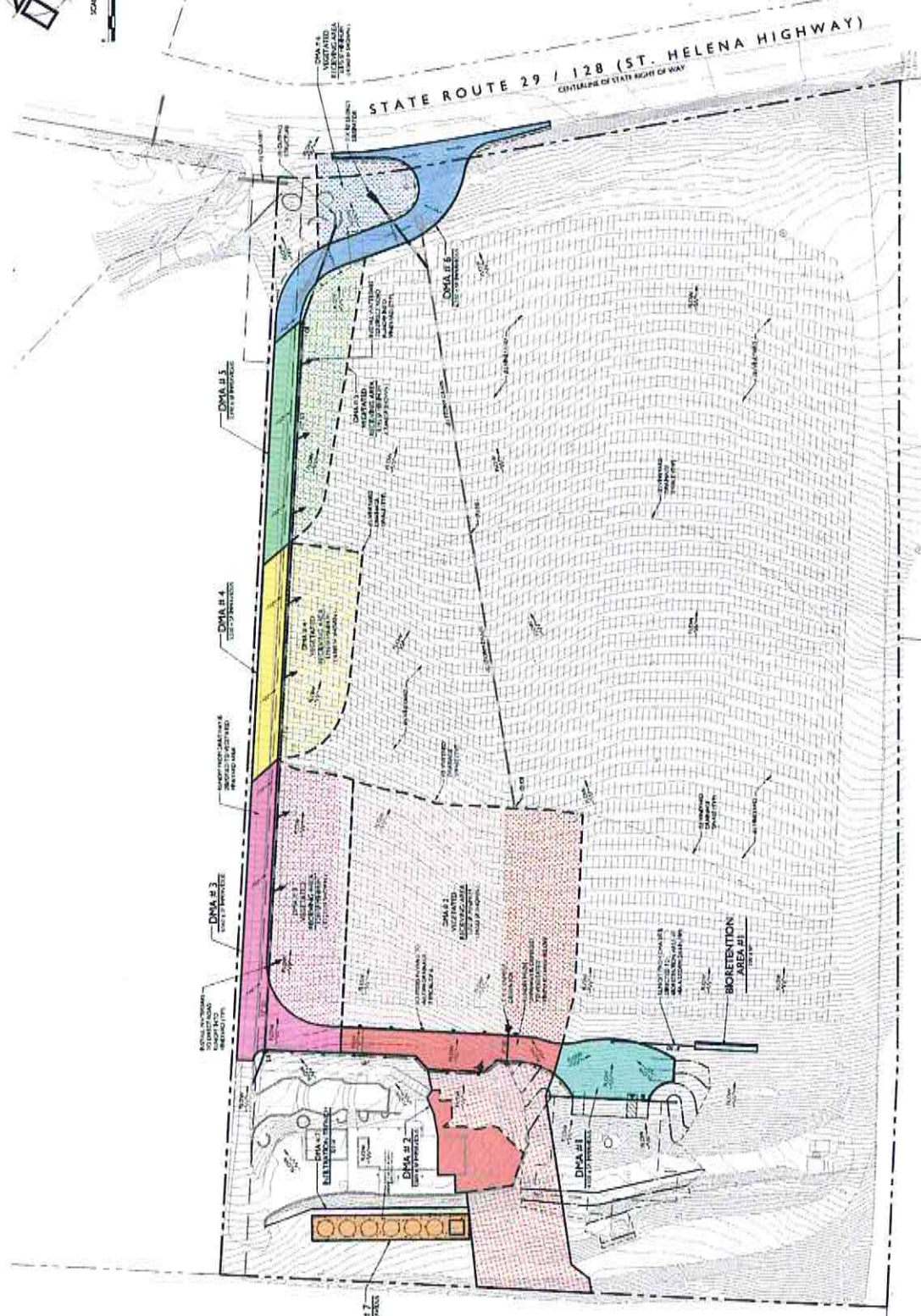
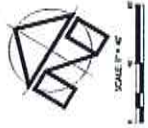
JOB NUMBER: [Redacted]
 SHEET NO.: [Redacted]
 ORIGINAL SIZE: 34" x 44"
 SHEET NUMBER: [Redacted]



DRIVEWAY ENTRANCE PLAN
 SCALE 1" = 10'

DRIVEWAY ENTRANCE PROFILE
 SCALE 1" = 10'

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LEGEND:

SWIFT FLOW DIRECTION	SWIFT FLOW DIRECTION
	PERVIOUS AREA
	ACCUMULATED BY DPM
	PERVIOUS AREA
	ACCUMULATED BY DPM
	PERVIOUS AREA
	ACCUMULATED BY DPM
	PERVIOUS AREA
	ACCUMULATED BY DPM

STORMWATER CONTROL PLAN EXHIBIT
 SCALE 1" = 40'

ONSITE WASTEWATER DISPOSAL FEASIBILITY STUDY

FOR THE

SODHANI WINERY

LOCATED AT:

3283 St. Helena Highway North
St. Helena, CA 94574
NAPA COUNTY APN 022-080-004

PREPARED FOR:

Arvind Sodhani
85 21st Avenue
San Francisco, CA 94121

Telephone: (415) 608-1565

PREPARED BY:



2074 West Lincoln Avenue
Napa, California 94558
Telephone: (707) 320-4968
www.appliedcivil.com

Job Number: 14-102

Michael R. Muelrath

Michael R. Muelrath R.C.E. 67435

12/5/2014

Date



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INTRODUCTION

Arvind Sodhani is applying for a Use Permit to construct and operate a new winery at his property located at 3283 St. Helena Highway North in Napa County, California. The subject property, known as Napa County Assessor's Parcel Number 022-080-004, is accessed directly off of State Route 29, approximately 0.5 miles north of the intersection of State Route 29 and Ehlers Lane.

The Use Permit application under consideration proposes the construction and operation of a new production only winery with the following characteristics:

- Wine Production:
 - 12,000 gallons of wine per year
 - Crushing, fermenting, aging and bottling

- Employees:
 - 2 full time employees
 - 2 part time employees

There is no visitor or marketing plan proposed as part of this application.

Existing improvements on the property include a single family residence, accessory structures, approximately 6.3 acres of vineyard and the related access and utility infrastructure. Domestic wastewater from the existing residence is collected in a septic tank and disposed of in a leach field located just northeast of the residence, above the vineyard. Please refer to the Sodhani Winery Use Permit Conceptual Site Plans for approximate locations of existing and proposed features.

Arvind Sodhani has requested that Applied Civil Engineering Incorporated (ACE) evaluate the feasibility of disposing of the winery process wastewater as well as the domestic sanitary wastewater that will be generated by the proposed winery via a new onsite wastewater disposal system. The remainder of this report describes the onsite soil conditions, the predicted process and sanitary wastewater flows and outlines the conceptual design of an onsite wastewater disposal system to serve the new winery facility.

SOILS INFORMATION

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County shows the entire property mapped as Boomer gravelly loam, 15 to 30 percent slopes.

A site specific soils analysis was conducted during site evaluations performed by Napa County on April 10, 2003 and April 23, 2003. The site evaluation consisted of the excavation and observation of eight test pits in vineyard portion of the property. The test pits generally revealed uniform soil conditions consisting of approximately 72 inches of acceptable clay loam soil.

Please refer to the Site Evaluation Report in Appendix 4 for additional details.

PREDICTED WASTEWATER FLOW

The onsite wastewater disposal system will be designed for the peak winery process wastewater flow and the peak sanitary wastewater flow from the proposed winery. The existing residence septic system will be displaced by the new driveway so the flow from the existing two bedroom residence will also be included in the design of the new septic system.

Winery Process Wastewater

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 size of the winery and our understanding that both red and white wines will be produced we have assumed a 30 day crush period. Using these assumptions, the average and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{12,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

$$\text{Annual Winery Process Wastewater Flow} = 72,000 \text{ gallons per year}$$

$$\text{Average Daily Winery Process Wastewater Flow} = \frac{72,000 \text{ gallons}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

$$\text{Average Daily Winery Process Wastewater Flow} = 197 \text{ gallons per day (gpd)}$$

$$\text{Peak Winery Process Wastewater Flow} = \frac{12,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{30 \text{ crush days}}$$

$$\text{Peak Winery Process Wastewater Flow} = 600 \text{ gpd}$$

Winery Sanitary Wastewater

The peak sanitary wastewater flow from the winery is calculated based on the number of winery employees. There are no plans for daily visitors for tours and tastings or private marketing events. In accordance with Table 4 of Napa County's "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. Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

Employees

$$\text{Peak Sanitary Wastewater Flow} = 4 \text{ employees} \times 15 \text{ gpd per employee}$$

$$\text{Peak Sanitary Wastewater Flow} = 60 \text{ gpd}$$

$$\text{Total Peak Winery Sanitary Wastewater Flow} = 60 \text{ gpd}$$

Residential Sanitary Wastewater

The peak sanitary wastewater flow from the existing residence is calculated based on the number of potential bedrooms in the residence.

In accordance with Napa County Code, the peak flow for a single family residences is calculated as 150 gpd per bedroom. Therefore the peak residential sanitary wastewater flow is calculated as follows:

Peak Residential Sanitary Wastewater Flow = 2 bedrooms X 150 gpd per bedroom

Peak Residential Sanitary Wastewater Flow = 300 gpd

Combined Peak Wastewater Flow

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

Combined Peak Flow = 600 gpd + 60 gpd + 300 gpd

Combined Peak Flow = 960 gpd

RECOMMENDATIONS

Based on the proposed site configuration, onsite soil conditions and estimated wastewater flows we have determined that there are at least two options for properly disposing of the process and sanitary wastewater generated at the proposed winery. A summary of each option is presented in the following sections of this report.

Option #1 – Sanitary Wastewater Subsurface Drip Disposal Field and Process Wastewater Hold and Haul

In this scenario the sanitary wastewater would be disposed of in a subsurface drip type septic system and the winery process wastewater would be collected separately, temporarily stored and then would be hauled offsite for treatment and disposal by the Napa Sanitation District, East Bay Municipal Utility District or a similar municipal wastewater treatment plant.

Required Disposal Field Area

The disposal field area is calculated based upon the design hydraulic loading rate for the soil conditions and the proposed design flow. Since the slope of the natural ground surface in the area of the proposed disposal field is more than 20% a 150% adjustment factor is required to accommodate for the steep slopes. Based on these design parameters, the required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Require Disposal Field Area} = \frac{360 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

Required Disposal Field Area = 900 square feet

Available Disposal Field Area

Based on the proposed site layout and topographic data prepared by Albion Surveys, we have determined that there is enough area to install approximately 900 square feet of subsurface drip disposal field in the vicinity of Test Pits #6 & #7. The conceptual layout of the disposal field is shown on the Sodhani Winery Use Permit Conceptual Site Plans in Appendix 2.

Pretreatment and Septic Tank Capacity

Pretreatment must be provided to treat the wastewater to meet Napa County pretreated effluent standards (BOD<30 mg/l, TSS < 30 mg/l). There are several options for pretreatment systems that are available to meet this requirement. The Applicant and the Engineer will review options and select a suitable pretreatment system designed to meet this requirement prior to application for a sewage permit for the winery. Septic tanks will be sized in accordance with the requirements of the selected pretreatment system.

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. For subsurface drip type septic systems the reserve area must be 200% of the size of the disposal field area. The required reserve area is calculated as follows:

$$\text{Required Reserve Area} = 200\% \times \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Require Reserve Field Area} = 200\% \times \frac{360 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

Required Reserve Area = 1,800 square feet

Based on the proposed site plan we have determined that there is enough area to set aside for an additional 1,800 square feet of subsurface drip disposal field in the vicinity of Test Pits #6 and #7 as shown on the Sodhani Winery Use Permit Conceptual Site Plans in Appendix 2.

Winery Process Wastewater Disposal

The winery process wastewater hold and haul system must be designed to hold at least seven days of peak flow (7 days x 600 gallons per day = 4,200 gallons), have a water level alarm and be designed and constructed in accordance with the requirements for hold and haul systems as outlined in Napa County Code Section 13.52.035.

Winery Process Wastewater Disposal Reserve Area

Napa County Code requires that an onsite “reserve area” be designated for process wastewater hold and haul systems. The reserve area will be onsite pre-treatment and irrigation as described in Option #2 below.

Option #2 – Sanitary Wastewater Subsurface Drip Disposal Field and Process Wastewater Treatment for Irrigation

In this scenario the sanitary wastewater would be disposed of in a subsurface drip type septic system and the winery process wastewater would be collected separately, pretreated, stored and disposed of via surface irrigation in the vineyard, landscaping or on natural vegetation outside of the required 100 foot well setbacks.

Required Disposal Field and Reserve Area

Sanitary wastewater disposal field and reserve areas are the same as described in Option #1 above.

Pretreatment and Septic Tank Capacity

Sanitary wastewater pretreatment and septic tank requirements in this scenario are the same as previously described in Option #1 above.

Process Wastewater Treatment & Disposal

We recommend that treatment be achieved through the use of a package plant type system or other treatment system designed to accept winery process wastewater that is capable of meeting the following treatment requirements:

<u>Parameter</u>	<u>Pre-treatment*</u>	<u>Post Treatment**</u>
pH	3 to 10	6 to 9
BOD ₅	500 to 12,000 mg/l	<160 mg/l
TSS	40 to 800 mg/l	<80 mg/l
SS	25 to 100 mg/l	<1 mg/l

* Reference California Regional Water Quality Control Board Central Coast Region General Waste Discharge Requirements Order No. R3-2008-0018 for winery process wastewater characteristics

** Required for discharge to land via surface irrigation by Napa County for samples taken at the discharge of the treatment unit.

Process Wastewater Disposal

To simplify this analysis we have assumed that final disposal of the treated effluent will be via surface drip irrigation in the vineyard. There are approximately 5.9 acres of vineyard area available outside of the required well setbacks. The treated process wastewater may also be able to be used for landscape irrigation outside of all required setbacks which would provide additional flexibility in operation of the disposal system. All application of treated winery process wastewater must comply with the requirements of the Napa County Winery Process Wastewater Guidelines for Surface Drip Irrigation and general wastewater setback requirements.

In order to accommodate differences in the timing of wastewater generation, irrigation demand and prohibitions on applying water to the land during rainy periods a storage tank will be required. We have prepared a water balance calculation to size a tank that will temporarily store wastewater generated at the winery before it is applied to the vineyard. The water balance calculation assumes a monthly wastewater generation rate and a monthly vineyard irrigation schedule based on our past experience with projects of this type. The water balance calculations show that the water generated by winery production operations each month can be effectively managed after treatment by applying it to the identified vineyard area. We recommend a minimum storage tank capacity of 10,000 gallons to provide operational flexibility in timing of land applications (see Appendix 4).

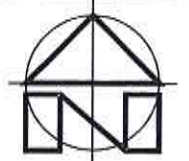
CONCLUSION

It is our opinion that the wastewater from the proposed winery can be accommodated in either of the two options previously described. Full design calculations and construction plans for the wastewater system(s) must be prepared in accordance with Napa County standards at the time of building permit application.

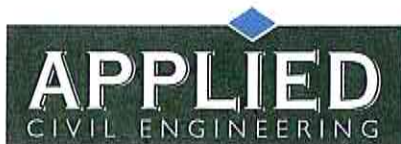
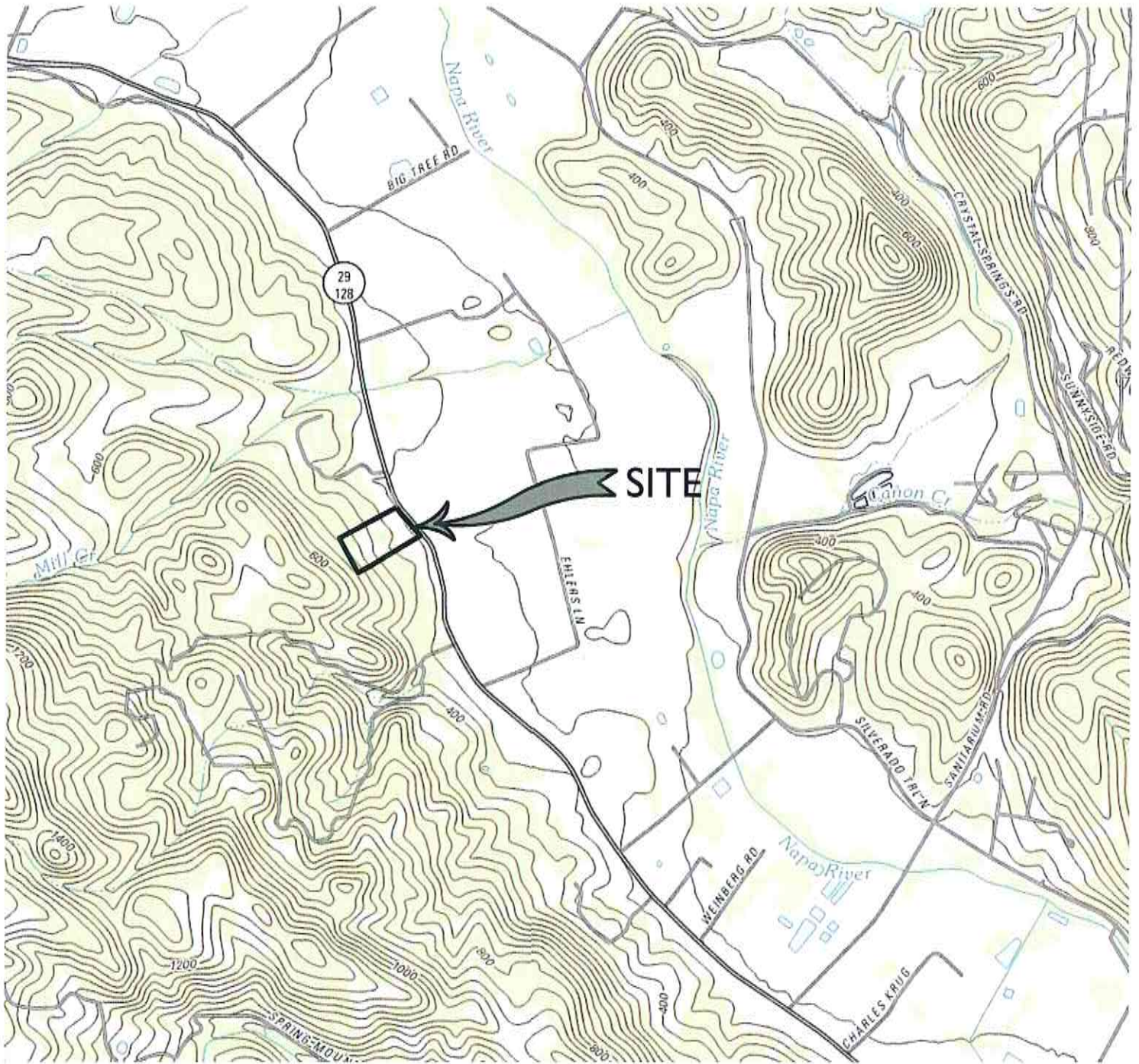
APPENDIX I: Site Topography Map

SITE TOPOGRAPHY MAP

REPRESENTS A PORTION OF THE
UNITED STATES GEOLOGICAL SURVEY 7.5 MINUTE QUADRANGLES
"CALISTOGA AND SAINT HELENA, CA "



SCALE: 1" = 2,000'



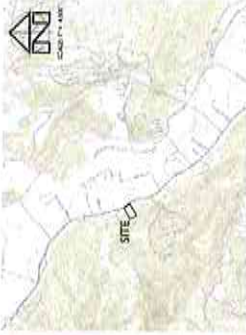
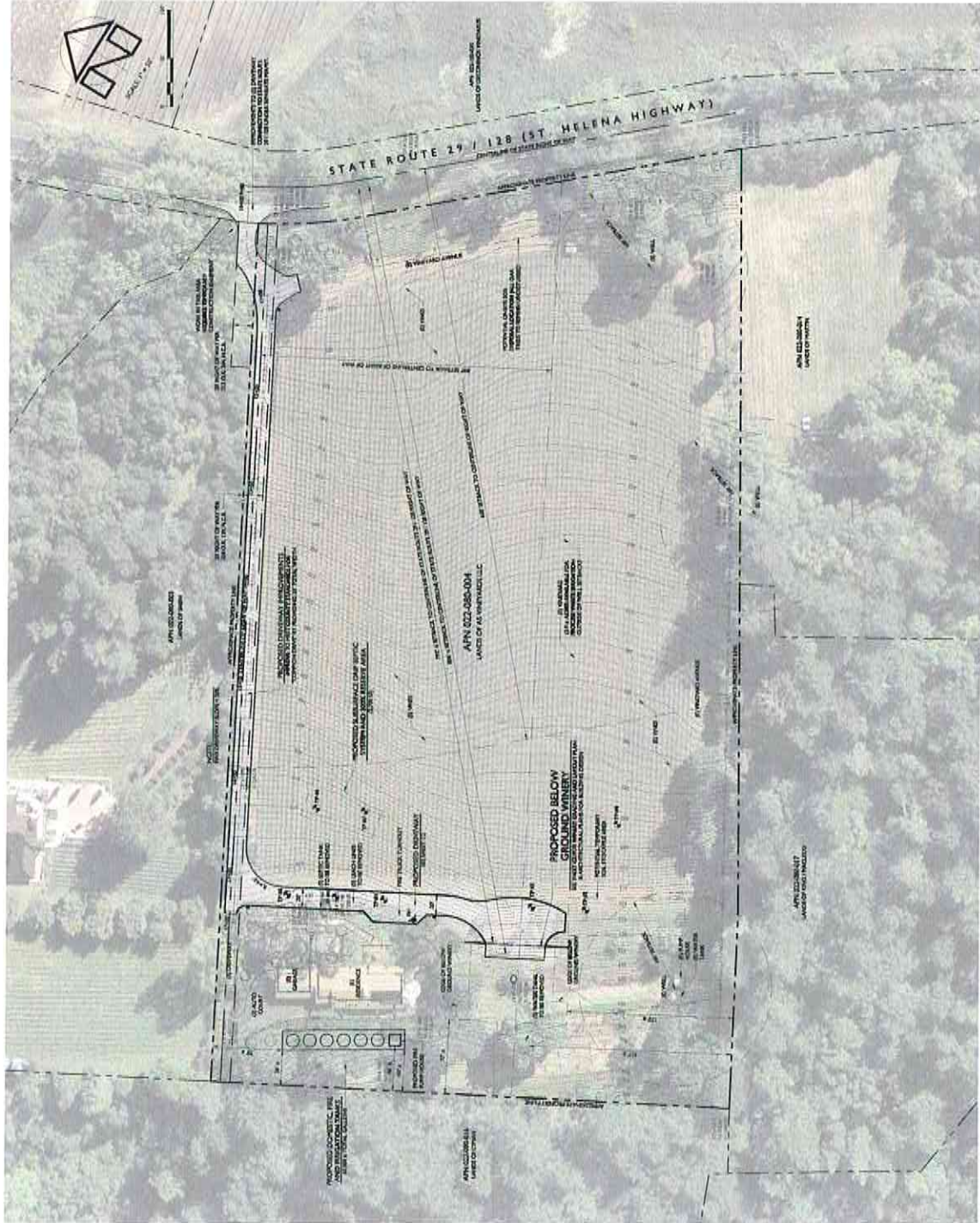
2074 West Lincoln Avenue
Napa, CA 94558
(707) 320-4968 (707) 320-2395 Fax
www.appliedcivil.com

SODHANI WINERY
3283 ST. HELENA HIGHWAY NORTH
ST. HELENA, CA 94574
APN 022-080-004

**APPENDIX 2: Sodhani Winery Use Permit Conceptual Site Plans
Reduced to 8.5" x 11"**

SODHANI WINERY

USE PERMIT CONCEPTUAL SITE PLANS



LOCATION MAP
SCALE: 1" = 1 MILE

PROJECT INFORMATION:
PROPERTY OWNER & APPLICANT:
 AS VINEYARDS LLC
 CAME CH. ARVIND SODHANI
 85 31ST AVENUE
 CERRITOS, CA 94515
SITE ADDRESS:
 1283 ST. HELENA HIGHWAY NORTH
 ST. HELENA, CA 94574
ASSESSOR'S PARCEL NUMBER:
 022-080-004

PARCEL SIZE:
 11.1 ± ACRES
PROJECT SIZE:
 1.4 ± ACRES
ZONING:
 AGRICULTURAL WATERSHED (AW)
DOMESTIC WATER SOURCE:
 ONSITE WELLS
FIRE PROTECTION WATER SOURCE:
 STORAGE TANKS
WASTEWATER DISPOSAL:
 ONSITE TREATMENT AND DISPOSAL

SHEET INDEX:
 OVERALL SITE PLAN
 WINEYARD GRADING AND LAYOUT PLAN
 WINEYARD ENTRANCE PLAN
 IRRIGATION AREA EXHIBIT

FLOOD HAZARD NOTE:
 ACCORDING TO THE FEDERAL FLOODING ADVISORY BOARD, FLOOD HAZARD INFORMATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.

GRADING QUANTITIES*

CUT	FILL
1,825 CY	1,825 CY
1,825 CY	1,825 CY

* THE QUANTITIES ARE PROVIDED AS A TOOL FOR THE ENGINEER'S REFERENCE TO EVALUATE THE ECONOMIC IMPACT OF THE PROJECT. IF NOT INTENDED TO BE USED FOR BIDDING, CONTRACT ADMINISTRATION, CALCULATIONS AND SHALL NOT BE USED FOR ANY OTHER PURPOSES. THE QUANTITIES ARE BASED ON THE ASSUMPTIONS AND CONDITIONS LISTED BELOW.

1. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

2. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

3. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

4. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

5. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

6. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

7. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

8. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

9. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

10. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

11. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

12. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

13. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

14. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

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16. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

17. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

18. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

19. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.

20. ALL QUANTITIES ARE BASED ON THE EXISTING TERRAIN AND DO NOT INCLUDE ANY FUTURE DEVELOPMENT.



DATE: 10/20/2024
 PROJECT NO.: 2024-001
 SHEET NUMBER: 4
 SCALE: AS SHOWN
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 APPROVED BY: [Signature]

OVERALL SITE PLAN
 SCALE: 1" = 1 MILE



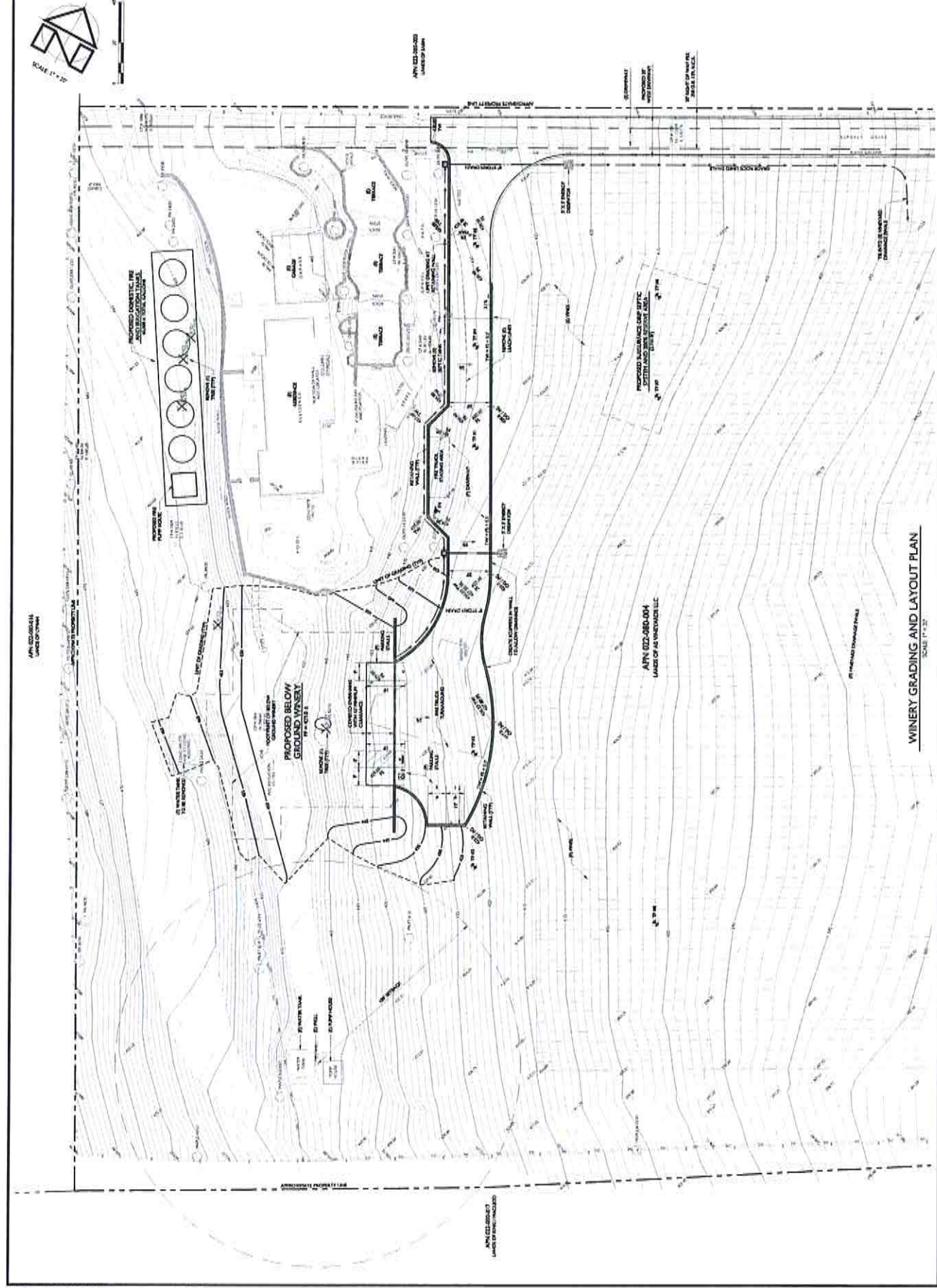
DATE: 02/28/2024
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 SCALE: AS SHOWN

SODHANI WINERY
 USE PERMIT CONCEPTUAL SITE PLANS
 WINERY GRADING AND LAYOUT PLAN

AS VINEYARDS LLC
 3283 ST. HELENA HIGHWAY NORTH
 NAPA COUNTY APN 022-080-004

DATE: FEBRUARY 2, 2024
 JOB NUMBER: 14-12
 FILE: 14-1202CONCEPTS
 ORIGINAL SIZE: 36" X 48"
 SCALE: AS SHOWN
 SHEET NUMBER: C2

OF 4



WINERY GRADING AND LAYOUT PLAN
 SCALE: 1" = 20'

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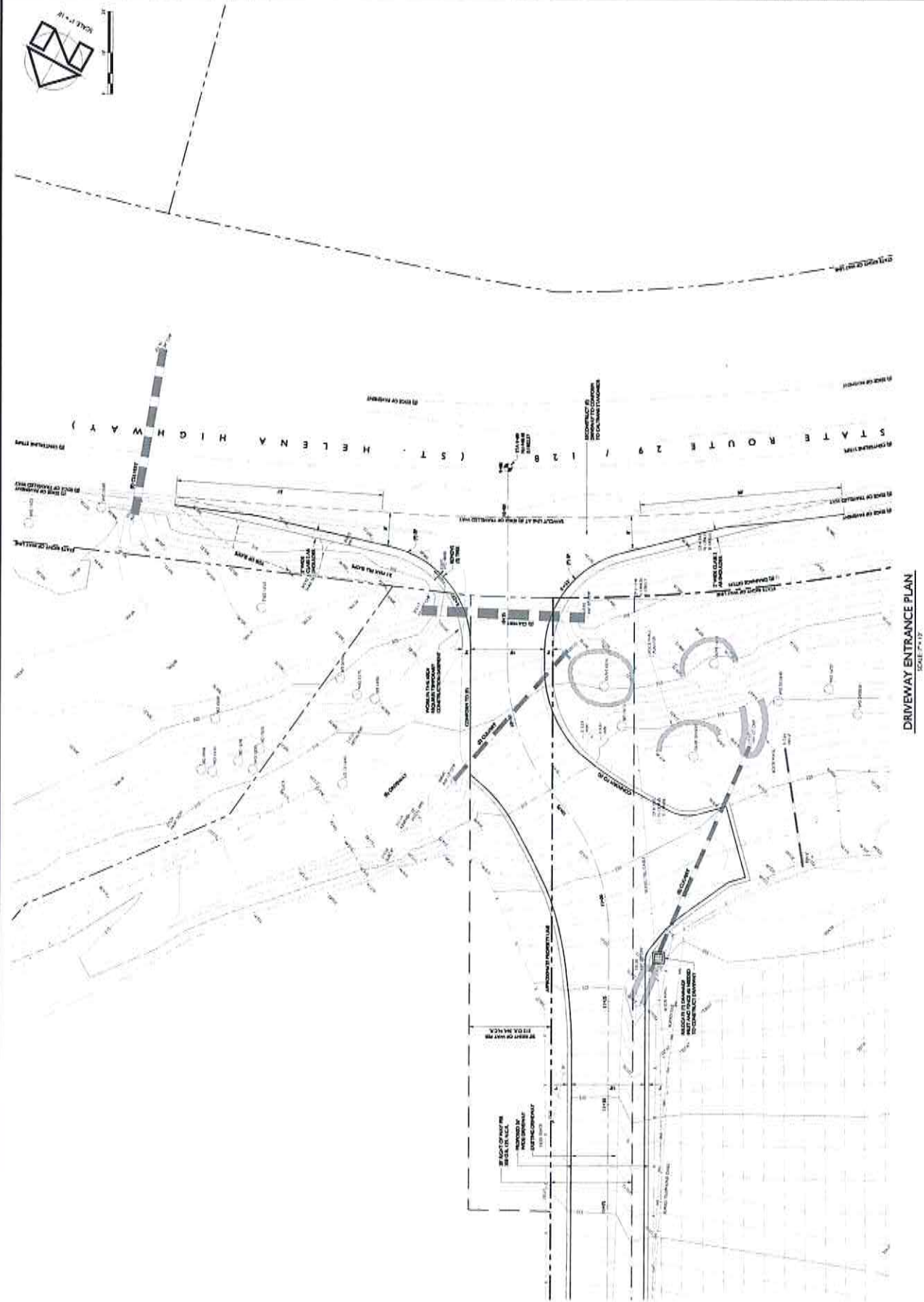
REGISTERED PROFESSIONAL ENGINEER
 DRAWN BY: JACOBSON
 CHECKED BY: JACOBSON
 DATE: 11/11/14

SODHANI WINERY
 USE PERMIT CONCEPTUAL SITE PLANS
 DRIVEWAY ENTRANCE PLAN

AS VINEYARDS LLC
 3283 ST. HELENA HIGHWAY NORTH
 NAPA COUNTY APN 022-080-004

DATE: DECEMBER 5, 2014
 PROJECT: 14-132
 FILE: 14-000000000
 ORIGINAL SIZE: 24" x 36"
 SCALE: AS SHOWN
 SHEET NUMBER: C3

OF
C3
 4



DRIVEWAY ENTRANCE PLAN
 SCALE 1" = 10'



DATE: 12/11/14
 DRAWN BY: DMS
 CHECKED BY: DMS
 PROJECT NO: 14-0000000000

SODHANI WINERY
 USE PERMIT CONCEPTUAL SITE PLANS
 IMPERVIOUS SURFACE EXHIBIT

AS VINEYARDS LLC
 3293 ST. HELENA HIGHWAY NORTH
 NAPA COUNTY APN 022-080-004

DATE: 12/11/14
 JOB NUMBER: 14-0000000000
 FILE: 14-0000000000
 ORIGINAL SIZE: 36" X 48"
 SCALE: AS SHOWN
 SHEET NUMBER: C4



IMPERVIOUS SURFACE EXHIBIT
 SCALE: 1" = 40'

APPENDIX 3: Water Storage Tank Water Balance Calculations

Irrigation Storage Tank Water Balance

Month	Beginning Balance	Process Wastewater	Land Application Capacity	Ending Balance
January	0	3,600	128,159	0
February	0	3,600	128,159	0
March	0	3,600	128,159	0
April	0	2,880	128,159	0
May	0	2,880	71,104	0
June	0	3,600	177,761	0
July	0	7,200	177,761	0
August	0	9,360	234,816	0
September	0	18,000	234,816	0
October	0	9,360	199,264	0
November	0	4,320	128,159	0
December	0	3,600	128,159	0
		72,000	1,864,478	

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. 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 12,000 gallons
 Wastewater Generation Rate 6 gallons per gallon of wine
 Annual Wastewater Generation 72,000 gallons
 Crush Season Length 30 days
 Wastewater Generated During Crush 1.5 gallons per gallon of wine
 Peak Wastewater Generation Rate 600 gallons per day

Month	Percentage of Annual Total	Monthly Flow (gallons)	Average Flow (gpd)
January	5.0%	3,600	116
February	5.0%	3,600	129
March	5.0%	3,600	116
April	4.0%	2,880	96
May	4.0%	2,880	93
June	5.0%	3,600	120
July	10.0%	7,200	232
August	13.0%	9,360	302
September	25.0%	18,000	600
October	13.0%	9,360	302
November	6.0%	4,320	144
December	5.0%	3,600	116
Total	100.0%	72,000	

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	5.9 acres
Vine Row Spacing	5 feet
Vine Spacing	3 feet
Vine density	2,904 vines per acre (average)
Total Vine Count	17,134 vines

Irrigation Information:

Seasonal Irrigation ¹	41.5 gallons per vine (May through October)	
Non-Irrigation Application	0.8 inches	October through April

Irrigation Schedule					
Month	Monthly Percentage ²	Irrigation per Vine (gallons)	Irrigation (gallons)	Non-Seasonal Irrigation Application (gallons)	Total (gallons)
January		0.0	0	128,159	128,159
February		0.0	0	128,159	128,159
March		0.0	0	128,159	128,159
April		0.0	0	128,159	128,159
May	10%	4.2	71,104	0	71,104
June	25%	10.4	177,761	0	177,761
July	25%	10.4	177,761	0	177,761
August	15%	6.2	106,657	128,159	234,816
September	15%	6.2	106,657	128,159	234,816
October	10%	4.2	71,104	128,159	199,264
November		0.0	0	128,159	128,159
December		0.0	0	128,159	128,159
Total	100%	41.5	711,044	1,153,434	1,864,478

Notes:

1. Irrigation per vine is based on 0.37 acre-feet per acre of vines per Vineyard Manager.
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.

APPENDIX 4: Site Evaluation Report

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
REQUEST FOR SITE EVALUATION INSPECTION

02-39

92-14448

ENVIRONMENTAL HEALTH DEPT. USE ONLY

FEE: \$348.00
DATE: 10/29/02
RECEIPT: 24857
BY: Cg

PARCEL NUMBER: 22-080-04
JOB ADDRESS: 3283 St Hel Hwy
OWNER: Sasha ~~Steen~~ & Bandy ~~Steen~~
TEST CONDUCTED BY: Bartelt

TYPE OF TEST: FIELD ANALYSIS

PERCOLATION TEST

To be run on 11/2/02 at 10:00 am/pm
W/CATI

To be run on _____ from _____ am/pm to _____ pm

PURPOSE OF TEST: HOUSE: WINERY: OTHER: _____

PROJECTED WASTEWATER FLOWS: _____ maybe 1050 gpd

PERCOLATION TEST INSPECTION RESULTS

Pre-soak checked? yes no _____ Length of pre-soak: _____

Checked by: _____ Date: _____

Rate at time of inspection: _____ Stabilized perc rate: _____

Gravel and Pipe Used? yes _____ no _____ If so, take the perc rate _____ x .6 = _____ in/hr

TYPE OF SYSTEM APPROVED

STANDARD SYSTEM

Acceptable soil to: 72" / Assigned perc range: 1-3 / 3-6 to 30" / 6-12

Depth of trenches: _____ / Rock under pipe: _____ / Cover over rock: _____

Lineal feet of leachline required: Depends upon project / Plot plan received: _____

Slope: ~10% / Surface drainage problems: none noted

Additional information: _____

SPECIAL DESIGN SYSTEM DUE TO THE FOLLOWING - Size constraints: _____

Perc rate too slow: _____ / Perc rate too fast: _____ / Steep slope: _____

Insufficient soil depth: _____ / High seasonal groundwater: _____

Acceptable soil for special design: _____ / Other problems: _____

E.H. Specialist Kim Withrow Date 4-10-03

FIELD ANALYSIS

TEXTURE (In the proposed trench zone)

CLAY CONTENT						SAND CONTENT						GRAVEL, COBBLE, STONE CONTENT								
Core Hole	1	2	3	4	5	6	Core Hole	1	2	3	4	5	6	Core Hole	1	2	3	4	5	6
Low (<12)							High (>50)							Very High (>60)						
Mod (12-27)	X	X	X	X	X		Mod (20-50)	X	X	X	X	X		High (35-60)						
High (27-40)							Low (<20)							Mod (15-35)						
High (>40)														Low (<15)	X	X	X	X	X	

STRUCTURE

SOIL DENSITY WHEN PICKED (Circle whether wet or dry)						CONSISTENCE (Circle wet or dry)							
Core Hole	1	2	3	4	5	6	Core Hole	1	2	3	4	5	6
pick sluffs or caves soil in	X	X	X	X	X		Easy	X	X	X	X	X	
pick bites and soil sluffs							Moderate						
pick bites/ little or no soil sluffs							Hard						

Core Hole	1	2	3	4	5	6
Granular						
Blocky	X	X	X	X	X	
Prism						
Platy						
Massive						
Cemented						

MODIFIER CHARACTERISTICS

- 1) Soil Survey Name: _____
- 2) Horizon Boundaries: Diffuse _____ Gradual X Abrupt _____
- 3) Topography: Concave _____ Convex X / Aspect: _____
- 4) Vegetation: Type Vineyard Condition: good

HOLE #1

EST. PERC	Description
3-6	0 to 30" loam → clay
1-3	30" to 38" clay loam
1-3	38" to 78" lighter clay loam

Roots: few fine to 60"
 Color: bright / dull
 Water Table: not noted
 Dug: easy / hard / dusty / smear
 Acceptable Soil To: 78"

CORE HOLE RECORD HOLE #2

EST. PERC	Description
3-6	0 to 30" loam → clay
1-3	30" to 42" clay loam
1-3	42" to 72" lighter clay loam

Roots: _____
 Color: bright / dull
 Water Table: not noted
 Dug: easy / hard / dusty / smear
 Acceptable Soil To: 72"

HOLE #3

EST. PERC	Description
	to _____
	to <u>same</u>
	to <u>as 1</u>

Roots: _____
 Color: bright / dull
 Water Table: not noted
 Dug: easy / hard / dusty / smear
 Acceptable Soil To: 72"

HOLE #4

EST. PERC	Description
3-6	0 to 52" loam → clay loam
1-3	52" to 72" clay loam

Roots: _____
 Color: bright / dull
 Water Table: not noted
 Dug: easy / hard / dusty / smear
 Acceptable Soil To: 72"

CORE HOLE RECORD HOLE #5

EST. PERC	Description
	to _____
	to <u>same</u>
	to <u>as 4</u>

Roots: _____
 Color: bright / dull
 Water Table: not noted
 Dug: easy / hard / dusty / smear
 Acceptable Soil To: 72"

4/23/03 HOLE #6

EST. PERC	Description
1-3	0 to 36"
1-3	36" to 72" <u>light clay loam</u>
	to <u>clay loam</u>

Roots: _____
 Color: bright / dull
 Water Table: _____
 Dug: easy / hard / dusty / smear
 Acceptable Soil To: _____

7+8 0-48" clay loam/loam 1-3
 40"-72" 1-3 clay loam/loam 2-6