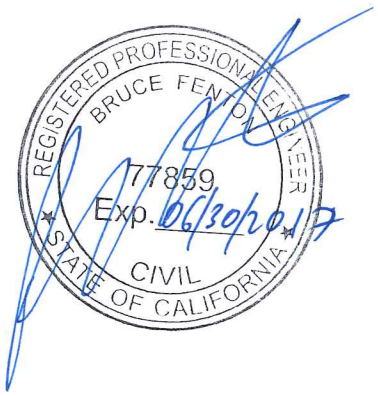
Wastewater Feasibility Study

Truchard Family Winery P14-00330-UP & P14-00331-VAR
Planning Commission Hearing Date September 20, 2017

WINERY WASTEWATER FEASIBILITY REPORT

TRUCHARD WINERY
4062 OLD SONOMA ROAD
NAPA, CALIFORNIA

APN 043-040-001
APN 043-040-003



PROPERTY OWNER:

Anthony Truchard
3234 Old Sonoma Road
Napa, CA 94559

Project# 4113042.0
October 13, 2016

1515 Fourth Street, Napa, CA 94559 www.rsacivil.com 707.252.3301.v 707.252.4966.f

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APPENDICES

INTRODUCTION

The owner is applying to the County of Napa for a Winery Use Permit. The permit will allow a production of 100,000 gallons per year. The Truchard Winery project is located at 4062 Old Sonoma Road, Napa, California 94559. The APN is 043-040-001. The project well will be located on an adjacent 126.1 acre parcel. Access to the property is an existing driveway connecting to Old Sonoma Road.

Most of the property is relatively level and is currently used for vineyards while Congress Valley Creek runs north/south through the western side of the property. The proposed winery location is east of Congress Valley Creek. One pond exists on the site. Appendix 1 contains a Site Location Map and a USGS Site Map showing the parcel topography, features and boundary. Appendix 2 contains a reduced version of the proposed winery plan set.

This report will evaluate the disposal of wastewater consisting of winery process wastewater, and winery domestic wastewater.

SITE EVALUATION

Riechers Spence & Associates conducted a site evaluation on the subject parcel on August 27, 2013. Appendix 3 contains a map of test pit locations and test pit logs for the site evaluation.

The site evaluation was conducted by Brett Frasier of Riechers Spence and Associates and observed by Maureen Shields Bown of Napa County Environmental Management. Representative soil samples were analyzed in the field during the site evaluation. The soil sample results are shown in Appendix 3. Site evaluation test pit logs are shown in Appendix 3.

On April 2, 2015 RSA+ conducted a second site evaluation on the subject and adjacent parcels. Appendix 4 contains a map of test pit locations and test pit logs for the site evaluation.

The site evaluation was conducted by Jake Stickler of RSA+ and observed by Peter Ex of Napa County Environmental Management. Representative soil samples were analyzed in the field during the site evaluation. The soil sample results are shown in Appendix 4. Site evaluation test pit logs are shown in Appendix 4.

WINERY PROCESS WASTEWATER CHARACTERISTICS

The following is a summary of the winery wastewater characteristics:

Wine Production:

100,000 gallons of wine per year
2.38 gallons of wine per case
42,017 cases/year

Wastewater Production:

5 gallons of wastewater/gallon of wine
500,000 gallons/year

Peak Daily Waste Water Flow:

Crush Period = 60 days
Annual wine production x 1.5 / 60
2,500 gallons/day

Average Daily Flow:

500,000/365 = 1,370 gallons/day

Monthly Wastewater Flows:

TABLE 1

	% By Month	Waste/Month	
Sep	15%	75,000	Gal/Month
Oct	15%	75,000	Gal/Month
Nov	11%	52,500	Gal/Month
Dec	8%	37,500	Gal/Month
Jan	4%	20,000	Gal/Month
Feb	6%	30,000	Gal/Month
Mar	6%	30,000	Gal/Month
Apr	5%	22,500	Gal/Month
May	6%	30,000	Gal/Month
Jun	7%	35,000	Gal/Month
Jul	9%	42,500	Gal/Month
Aug	10%	50,000	Gal/Month
Totals	100%	500,000	Gal/Year

DOMESTIC WASTEWATER CHARACTERISTICS

The winery domestic wastewater system has been sized to accommodate the unit values in Table 2 below. The number of visitors and employees is based on information provided by the owner. The projected flow is based on Napa County Environmental Management guidelines. The following is a summary of the estimated flows from the proposed winery.

Table 2

Use	Source	Number	Projected Flow (gpd)	Total Flow No Event Day (gpd)	Total Flow Event Day (gpd)
WINERY	Full-time employees	4	15	60	60
	Part-time employees	3	15	45	45
	Harvest employees	2	15	30	30
	Visitors	60	3	180	180
	Private Event w/ meals (catered)	30	10	0	300
	Event Staff	2	15	0	30
Winery Subtotals				315	615
Grand Total			**Total Peak Flow**	**315**	**645**

The number of visitors is based on a maximum expected daily visitor count. Any combination of events where the expected total guest count exceeds 90 persons in a single day will require the use of portable sanitation facilities.

WINERY PROCESS WASTEWATER - SURFACE DRIP IRRIGATION

According to Napa County Environmental Management Sewage Treatment System Design Guidelines, winery process wastewater must be treated prior to surface discharge. Based on our experience, winery wastewater characteristics are as follows:

Characteristics	Units	Average
pH		3.5
BOD5	mg/l	6000
TSS	mg/l	500
Nitrogen	mg/l	20
Phosphorus	mg/l	10

The treatment goal is 160 mg/l BOD and 80 mg/l TSS. To meet this treatment goal a treatment train including a septic tank, treatment tank with High Strength Membrane Bio-Reactor (HSMBR) unit, and pump tank are proposed. This treatment train may be modified for more desirable treatment processes prior to submitting construction plans. The following sections describe this process in more detail. This system is shown on Sheet UP3 contained in Appendix 2.

Septic Tank

The septic tank will serve to buffer peak flows and strengths from overwhelming the system and impairing treatment. A new tank will be provided. This tank will provide two days storage and will also serve to function as a primary settling basin. This tank will be 5,000 gallons.

Treatment Tank

The treatment tank will serve to treat wastewater flows using a High Strength Membrane Bio-Reactor (HSMBR) unit. This tank will be 30,000 gallons.

Pump Tank

The pump tank will serve to hold wastewater prior to distribution to the storage tank. This tank will house dual pumps. This tank will be 800 gallons.

Holding Tank and Dispersal Field

To provide a preliminary estimate of the amount of storage tanks required, we have prepared a monthly water balance, as shown in Appendix 5. Monthly wastewater production is based on a percentage of the total annual wastewater production. The amount of water allowed to be applied is estimated by the typical vine water demand. The irrigation will be applied to areas of vineyards outside well setback requirements. The area proposed for irrigation is located on the adjacent parcel 043-040-003 and is shown in Appendix 5. An area of 8.0 acres of vineyard and 1.0 acres of cover crop has been used to calculate the storage capacity required. Based on monthly analysis 5,647 gallons of storage are required. However, a storage capacity of 20,000 gallons will be provided for treated process wastewater generated during wet weather periods. This is based on providing a minimum of 10 days storage of the average process wastewater flows plus the storage required by the monthly water balance.

During the summer months all of the treated wastewater will be used for irrigation. During the wet winter months, a limited discharge will be consistent with landscape water demand and no discharge will occur within 48-hours of a forecasted rain event and also for 48-hours after a rain event. These irrigation scheduling constraints necessitate installing a tank to store excess water that cannot be discharged during the winter months. All stored water will then be used for irrigation during the summer months.

WINERY PROCESS WASTEWATER - HOLD & HAUL OPTION

Napa County Design Guidelines require a Hold and Haul volume equivalent to 7 days of peak process waste flow. This equates to 17,500 gallons of required storage for the proposed project at full production. Wastewater would be hauled to a facility permitted to accept winery process wastewater.

For this option pre-cast concrete holding tanks or equivalent capacity fiberglass tanks would be used. A high water alarm beacon, powered by the electrical system in the winery, will be located on an exterior panel.

Hold and haul would only be used in extenuating situations such as extended wet weather event exceeding 10 days of rain.

DOMESTIC WASTEWATER - SUB SURFACE DRIP

A septic system and dispersal field will be designed for the proposed winery. A HOOT treatment system and a new dispersal field are proposed.

Domestic wastewater from the proposed tasting room will flow into a new HOOT H-1000 tank. After pretreatment in the HOOT H-1000, wastewater will be pumped to the proposed distribution field.

The subsurface drip field is sized to meet Napa County Environmental Management guidelines. The distribution field will be placed in the area of the site evaluation where the most limiting usable soil type was sandy clay with a strong subangular-blocky structure. A 12-inch fill will be added to meet Napa County requirements. The allowable application rate for sandy clay is 0.3 gallons/square foot/day for pre-treated effluent. Peak daily domestic wastewater flow is 645 gallons/day.

$$Dispersal\ Field\ Area(primary) = \frac{645\ gpd}{0.3\ gpd/SF} = 2{,}150\ square.feet$$

In addition to the primary dispersal area of 2,150 square feet, a 200% reserve area is required. The reserve area will be located adjacent to the primary field where the soil application rate is also 0.3 gallons/square foot/day.

$$Dispersal\ Field\ Area\ (reserve\ area) = \frac{645\ gpd}{0.3\ gpd/SF} = 2{,}150\ square.feet$$

The total requirement for domestic wastewater reserve dispersal area is 4,300 square feet. Total combined area required for the primary and reserve is 6,450 square feet.

The system layout is shown on UP3 in Appendix 2.

FUTURE DISPERSAL FIELD

An alternative future dispersal field will be constructed as shown on the Use Permit Plans. A 30-inch fill will be placed in this area and naturalized for 1 to 2 years. The area of this dispersal field will be 2,150 square feet. A site evaluation inspection will be carried out to prove this area is suitable for sanitary wastewater dispersal.

The intent of alternative dispersal field is to remove the primary field from the existing vineyard to preserve the quality of fruit that may be impacted by the addition of excess nutrient.

OPERATION AND MAINTENANCE

The winery process and domestic wastewater systems will be fully automated and will be designed so minimal input from winery staff is required. Per Napa County guidelines, a Registered Civil Engineer, Registered Environmental Health Specialist, or Licensed Contractor will provide semi-annual monitoring and evaluation of the system. The contract with the responsible party will be provided prior to the final inspection for the system installed.

CONCLUSION

This report demonstrates that enough dispersion area is available making a sub-surface drip system a feasible option for treating the Truchard Winery domestic wastewater. It has also been demonstrated that it is feasible to treat the winery process wastewater and distribute this to the vineyard using drip irrigation.

The above methodology results in a design that meets the Napa County Environmental Management Design standards for the treatment of winery and domestic wastewater.

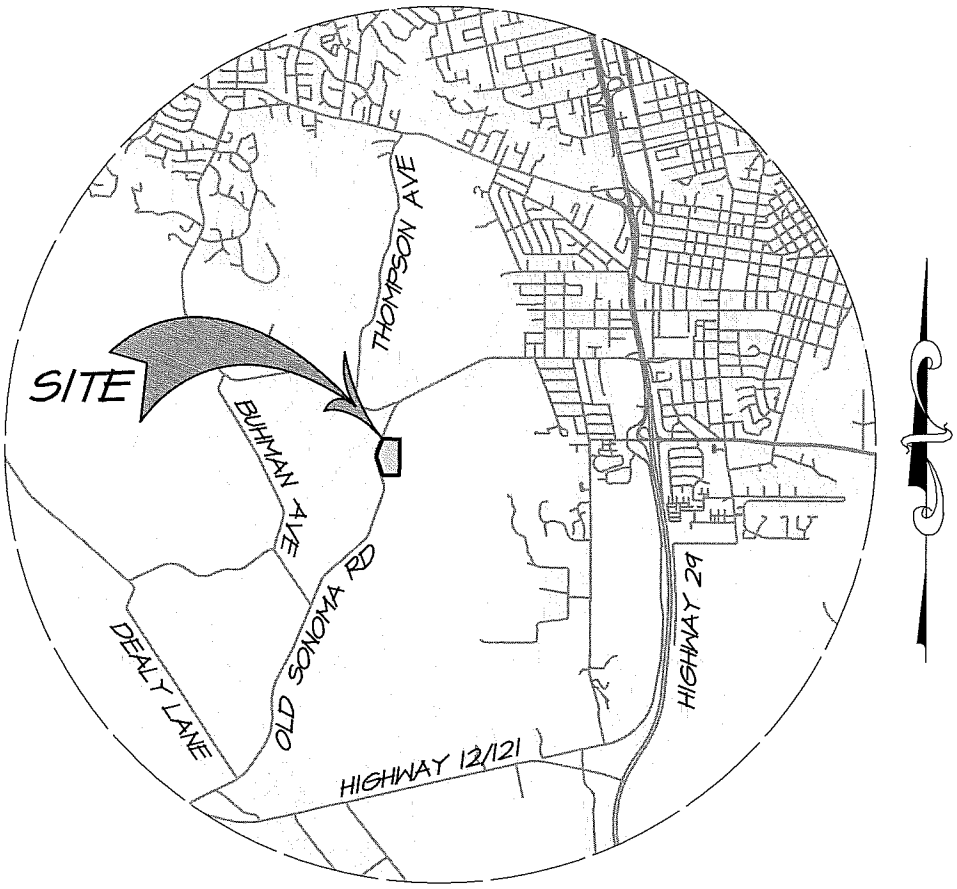
Appendix 1

Vicinity Map & USGS Site Map

TRUCHARD WINERY
VICINITY MAP

NAPA CALIFORNIA

SCALE: 1" = 5000'



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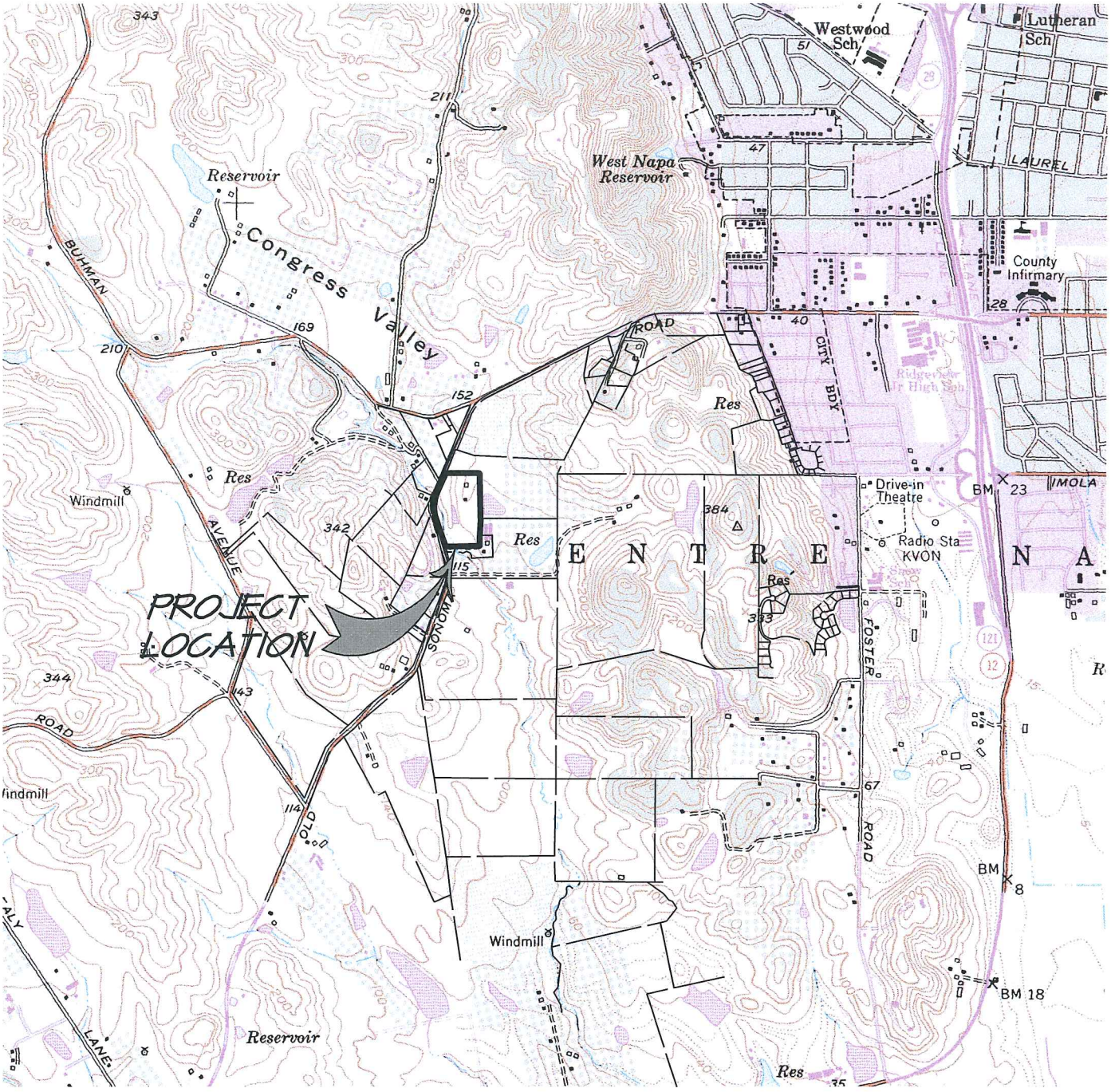
August 15, 2016 4113042.0 Exh-Vic Map.dwg

TRUCHARD WINERY
USGS QUAD MAP



SCALE: 1"=2000'

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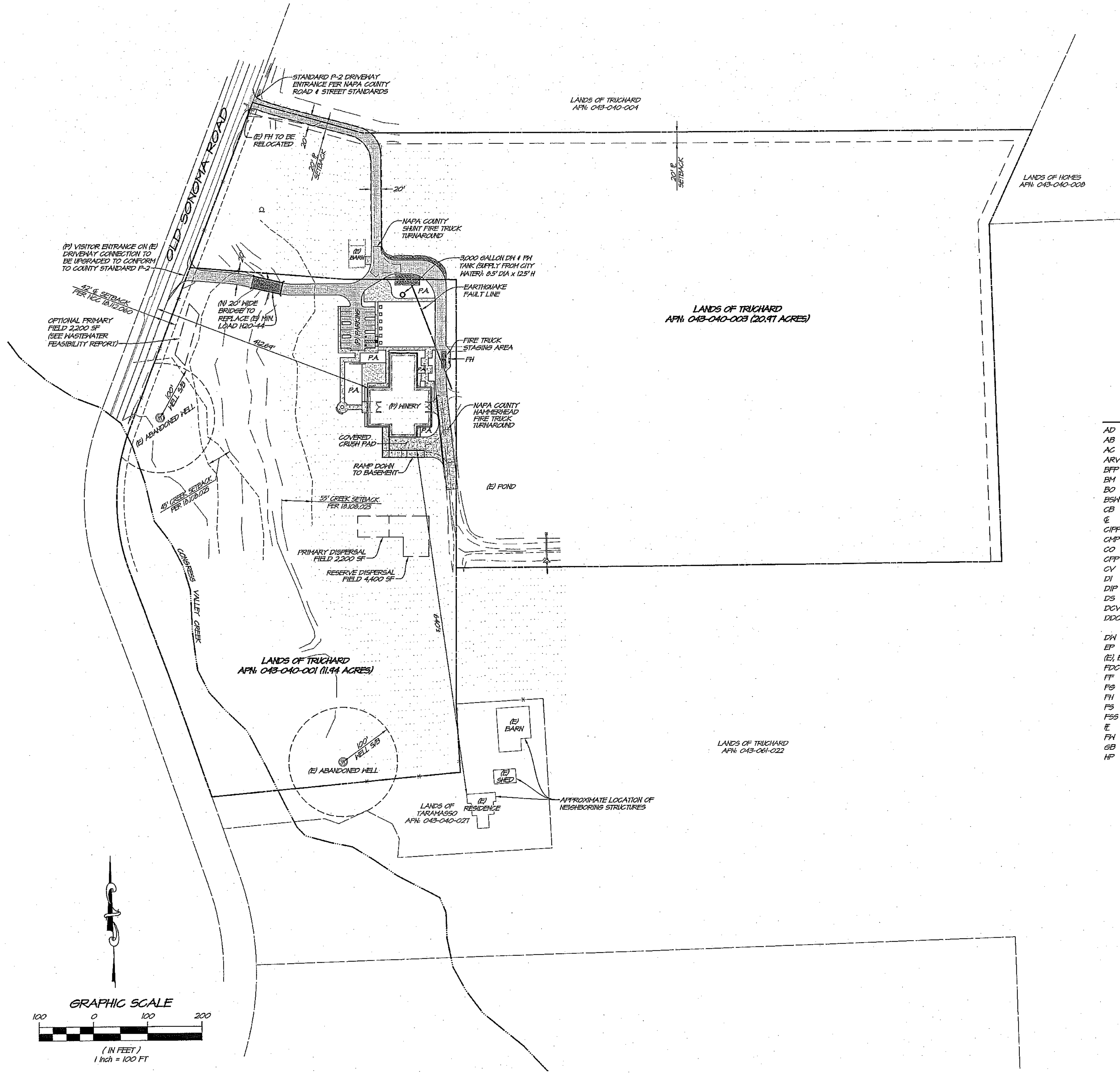
August 15, 2016 4113042.0 Exh-USGS.dwg

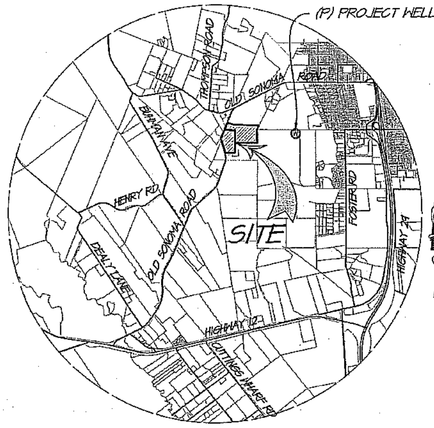
Appendix 2

Reduced Use Permit Plan Set

TRUCHARD WINERY

WINERY USE PERMIT





LOCATION MAP

NO SCALE

PROJECT INFORMATION

OWNER:	TRUCHARD VINEYARDS
OWNER ADDRESS:	3234 OLD SONOMA ROAD NAPA, CA 94559
CONTACT:	ANTHONY M. TRUCHARD II TEL: 707-253-7153
SITE ADDRESS:	4062 OLD SONOMA ROAD NAPA, CA 94559
CIVIL ENGINEER:	RSA+ 1515 FOURTH STREET NAPA, CA 94559
CONTACT:	HUGH LINN TEL: 707-252-3301
APN & AREA:	043-040-001 11.94 ACRES 043-040-003 20.97 ACRES
EXISTING USE:	AGRICULTURAL
PROPOSED USE:	WINERY
ZONING:	AW

ABBREVIATIONS

AD	AREA DRAIN	INV	INVERT
AB	AGGREGATE BASE	IP	IRON PIPE
AC	ASPHALT CONCRETE	JP	JOINT POLE
ARV	AIR RELEASE VALVE	LF	LINEAL FEET/FOOT
BFP	BACK FLOW PREVENTER	LP	LOW POINT
BM	BENCHMARK	MH	MANHOLE
BO	BLOWOFF	OC	ON CENTER
BSW	BACK OF SIDEWALK	OH	OVERHEAD
CB	CATCH BASIN	(P)	PROPOSED
℄	CENTERLINE	P.A.	PLANTING AREA
CIPP	CAST IN PLACE PIPE	PCC	PORTLAND CEMENT CONCRETE
CMP	CORRUGATED METAL PIPE		
CO	CLEANOUT	PG&E	PACIFIC GAS AND ELECTRIC
CPP	CORRUGATED PLASTIC PIPE	PIV	POST INDICATOR VALVE
CV	CHECK VALVE	ℙ	PROPERTY LINE
DI	DROP INLET	PVC	POLYVINYL CHLORIDE
DIP	DUCTILE IRON PIPE	PW	PROCESS WATER
DS	DOWNSPOUT	PWW	PROCESS WASTE WATER
DCV	DOUBLE CHECK VALVE	R	RADIUS
DDCV	DOUBLE DETECTOR CHECK VALVE	ROW	RIGHT OF WAY
		RCP	REINFORCED CONCRETE PIPE
DW	DOMESTIC WATER	S	SLOPE (FEET/FOOT)
EP	EDGE OF PAVEMENT	SD	STORM DRAIN
(E), EX	EXISTING	SFAP	SEPARATED FOR ASSESSMENT PURPOSES
FDC	FIRE DEPT. CONNECTION		
FF	FINISH FLOOR	SS	SANITARY SEWER
FG	FINISH GRADE	STA	STATION
FH	FIRE HYDRANT	STD	STANDARD
FS	FIRE SERVICE	TC	TOP OF CURB
FSS	FORCE SANITARY SEWER	TW	TOP OF WALL
FL	FLOW LINE	VCP	VITRIFIED CLAY PIPE
FW	FIRE WATER	W	DOMESTIC WATER LINE
GB	GRADE BREAK	WM	WATER METER
HP	HIGH POINT	WV	WATER VALVE

BOUNDARY NOTE

THE BOUNDARIES SHOWN HEREIN ARE BASED UPON TOPOGRAPHIC MAP PREPARED BY RSA, NOVEMBER 2013.

TOPOGRAPHIC MAP

TOPOGRAPHIC MAP PREPARED BY RSA, NOVEMBER 2013. REVISED JANUARY 2015.

BENCHMARK

NAPA COUNTY #817-C. ELEVATION = 127.77 (NGVD 1988). PUBLISHED ELEVATION = 125.22' (NGVD 1929) ADJUSTMENT PER CORPSCON 6: +2.55'

SHEET INDEX

UP1	SITE AND WINERY LAYOUT PLAN
UP2	GRADING & EROSION CONTROL PLAN
UP3	UTILITY PLAN
UP4	COVERAGE AND DEVELOPMENT

SYMBOL LEGEND

EXISTING

EX SD	STORM DRAIN LINE
EX W	WATER LINE
TREE	TREE TO REMAIN
—X— —X—	FENCE
235	CONTOUR LINE
+231.5	SPOT ELEVATION

PROPOSED

SD	STORM DRAIN LINE
SS	SANITARY SEWER LINE
PWW	PROCESS WASTE WATER LINE
1" W	1" WATER LINE
3" W	3" DOMESTIC AND PROCESS WATER LINE
[6" FW]	6" FIRE WATER LINE
	DIRECTION OF EXISTING DRAINAGE

HATCH LEGEND

- (P) BUILDING
- 20' WIDE ASPHALT CONCRETE SURFACED ROAD DESIGNED AND MAINTAINED TO SUPPORT LOAD EQUIVALENT TO H20-44 (40,000 LBS VEHICLE) DESIGN PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. MIN. TI OF 6.0.
- CONCRETE PAVING PER LANDSCAPE PLANS
- GRAVEL PER LANDSCAPE PLANS
- DECOMPOSED GRANITE PER LANDSCAPE PLANS

PARKING SUMMARY

ACCESSIBLE	2
VISITOR	5
EMPLOYEE	6
TOTAL	13

NO.	DATE	REVISIONS	BY	APPD

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TRUCHARD WINERY
SITE AND WINERY LAYOUT PLAN
NAPA COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER BRICE WILLIAM FENTON No. 77859 Exp. 6-30-17 CIVIL ENGINEER STATE OF CALIFORNIA

DATE	OCTOBER 13, 2016
DRAWN	EB/JFW
DESIGNED	EB/MSS
CHECKED	BWF
JOB NO.	4113042.0

SHEET NO. UP1
1 OF 4 SHEETS

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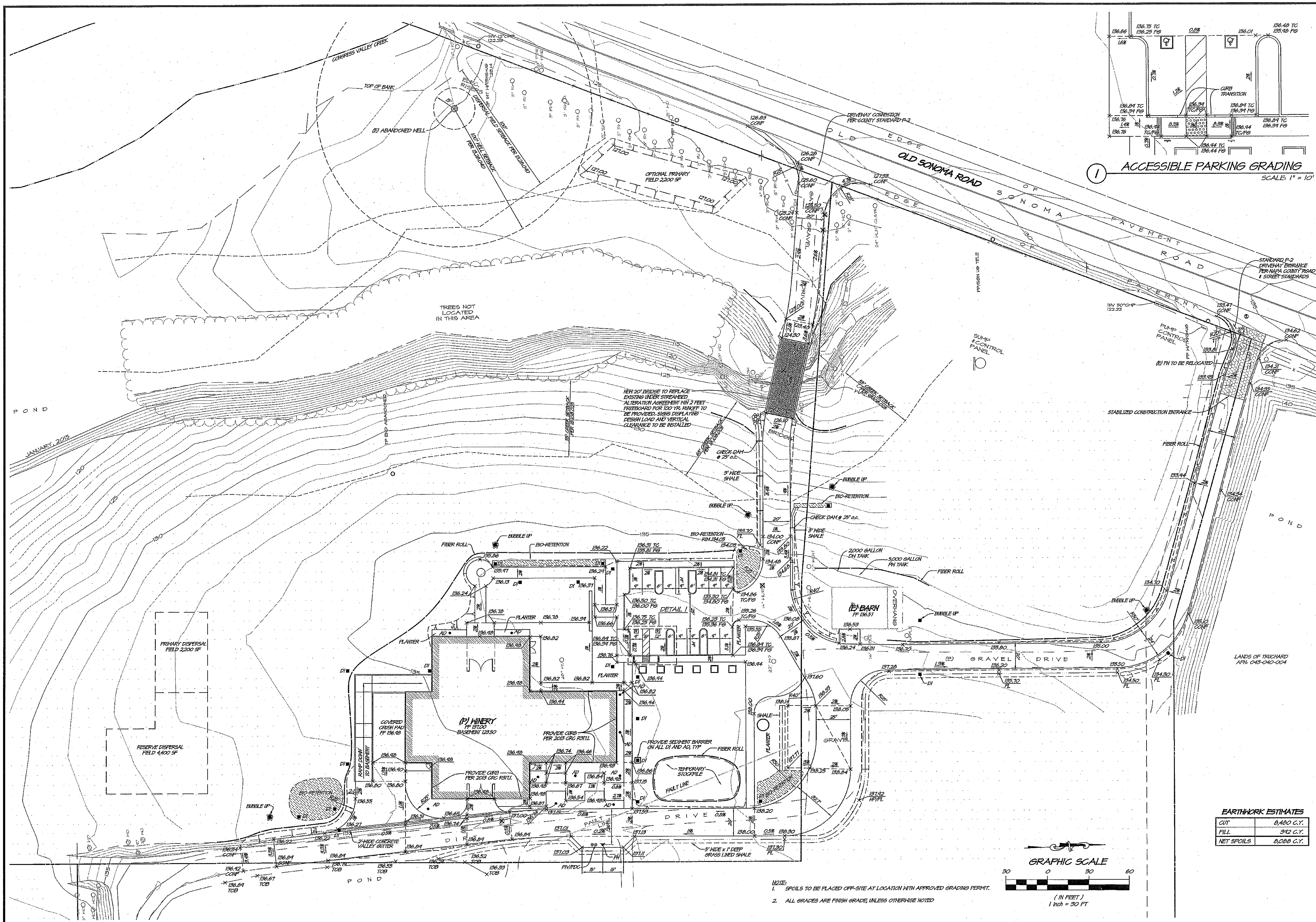

NOTE:

1. SPOILS TO BE PLACED OFF-SITE AT LOCATION WITH APPROVED GRADING PERMIT.
2. ALL GRADES ARE FINISH GRADE, UNLESS OTHERWISE NOTED

EARTHWORK ESTIMATES

CUT	8,480 C.Y.
FILL	392 C.Y.
NET SPOILS	8,088 C.Y.

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TRUCHARD WINERY
GRADING & EROSION CONTROL PLAN

NAPA COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER BRUCE WILLIAM FENTON No. 77659 Exp. 6-30-17 CIVIL ENGINEER STATE OF CALIFORNIA

DATE	OCTOBER 13, 2016
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DESIGNED	EB/MSS
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SHEET NO.
UP2
2 OF 4 SHEETS

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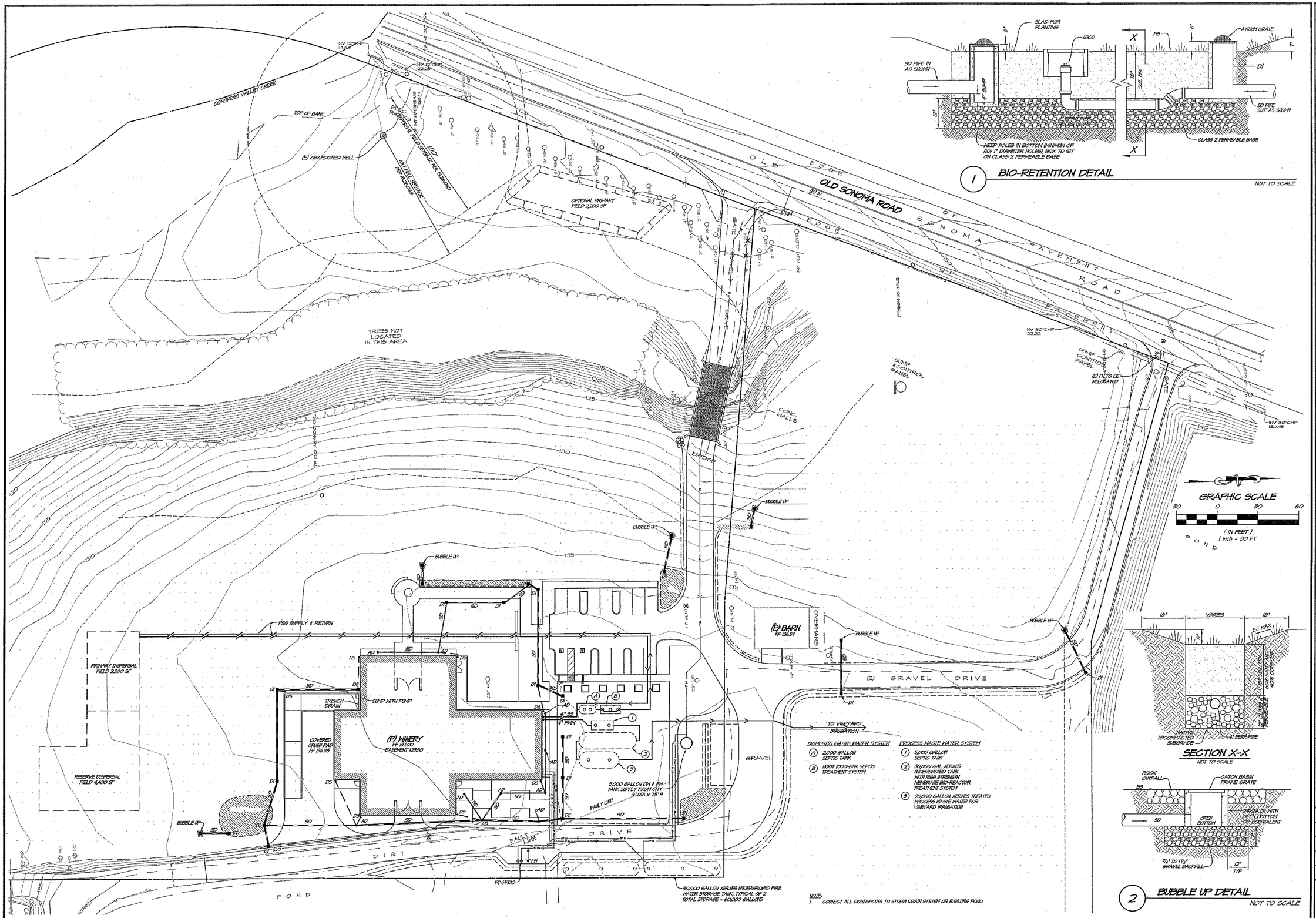

DOMESTIC WASTE WATER SYSTEM

- Ⓐ 2,000 GALLON SEPTIC TANK
- Ⓑ HOOT 1000-BNR SEPTIC TREATMENT SYSTEM

PROCESS WASTE WATER SYSTEM

- ① 5,000 GALLON SEPTIC TANK
- ② 30,000 GAL XERXES UNDERGROUND TANK WITH HIGH STRENGTH MEMBRANE BIO-REACTOR TREATMENT SYSTEM
- ③ 20,000 GALLON XERXES TREATED PROCESS WASTE WATER FOR VINEYARD IRRIGATION

NOTE:
1. CONNECT ALL DOWNSPOUTS TO STORM DRAIN SYSTEM OR EXISTING POND.

NO.	DATE	REVISIONS	BY	APP'D

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TRUCHARD WINERY UTILITY PLAN

NAPA COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
BRUCE WILLIAM FENTON
No. 77859
Exp. 6-30-17
CIVIL ENGINEER
STATE OF CALIFORNIA

DATE	OCTOBER 13, 2016
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SHEET NO.
UP3
3 OF 4 SHEETS

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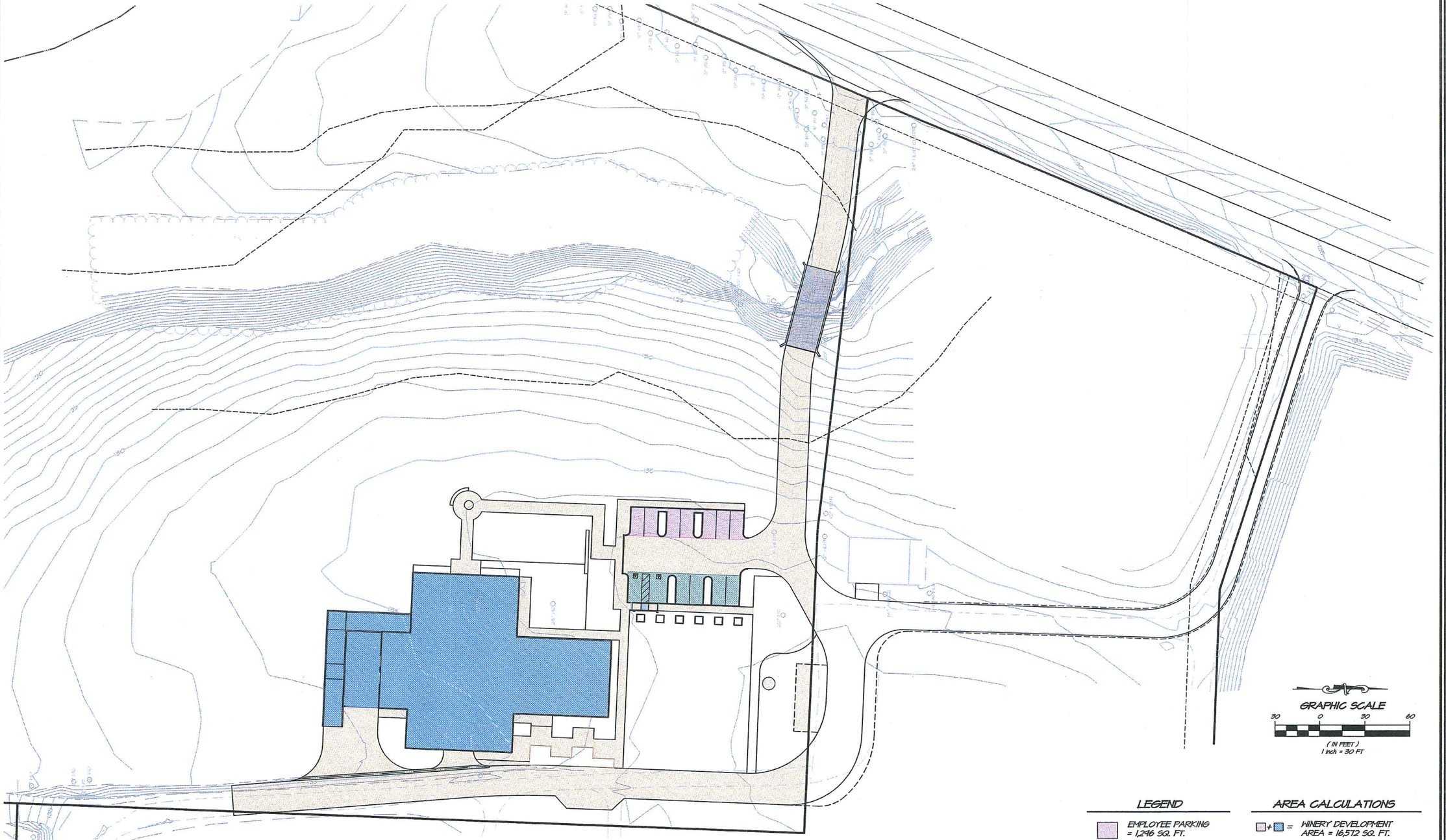

LEGEND

- EMPLOYEE PARKING = 1,296 SQ. FT.
- VISITOR PARKING = 1,308 SQ. FT.
- STRUCTURES = 15,276 SQ. FT.
- PAVED AREA AND ABOVE GROUND TANKS = 26,084 SQ. FT.

AREA CALCULATIONS

- + = WINERY DEVELOPMENT AREA = 16,572 SQ. FT.
- + + + = WINERY COVERAGE AREA = 43,964 SQ. FT.

TRUCHARD WINERY
COVERAGE & DEVELOPMENT

NAPA COUNTY CALIFORNIA

NO.	DATE	REVISIONS	BY	APPD

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REGISTERED PROFESSIONAL ENGINEER — WILLIAM F. HEARY — No. 72004 — Exp. 3-31-17 — CIVIL ENGINEER — STATE OF CALIFORNIA

DATE	OCTOBER 13, 2016
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DESIGNED	EB/MES
CHECKED	BHF
JOB NO.	4113042.0

SHEET NO.
UP4
4 OF 4 SHEETS

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PRELIMINARY - NOT FOR CONSTRUCTION

Appendix 3

2013 Site Evaluation Report

Permit Number: E13-00494
APN 043-040-001
RSA Project Number: 4113042.0

Date:

Napa County Department of Environmental Management

SITE EVALUATION REPORT

Please attach an 8.5" x 11" plot map showing the locations of all test pits triangulated from permanent landmarks or known property corners. The map must be drawn to scale and include a North arrow, surrounding geographic and topographic features, direction and % slope, distance to drainages, water bodies, potential areas for flooding, unstable landforms, existing or proposed roads, structures, utilities, domestic water supplies, wells, ponds, existing wastewater treatment systems and facilities.

Permit #: E013-00494
APN: 043-040-001
(County Use Only) Reviewed by: Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner Truchard Vineyards	☒ New Construction ☐ Addition ☐ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address 3234 Old Sonoma Road	☐ Residential - # of Bedrooms: Design Flow : gpd
City: Napa State: CA Zip: 94559	☒ Commercial -- Type: Winery Sanitary Waste: TBD gpd Process Waste: TBD gpd
Site Address/Location 4062 Old Sonoma Road Napa, CA 94559	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name Riechers Spence & Associates	Evaluator's Name Brett Frasier	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist)
Mailing Address: 1515 Fourth Street		Telephone Number 707-252-3301
City: Napa State: CA Zip: 94559		Date Evaluation Conducted 8/27/2013

Primary Area

Acceptable Soil Depth: 24 in. Test pit #'s: 19-24

Soil Application Rate (gal. /sq. ft. /day): 0.30

System Type(s) Recommended: Subsurface Drip with Pretreatment

Slope: 2-9%. Distance to nearest water source: > 100' to well
> 50' to reservoir

Hydrometer test performed? No ☒ Yes ☐ (attach results)

Bulk Density test performed? No ☒ Yes ☐ (attach results)

Percolation test performed? No ☒ Yes ☐ (attach results)

Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Expansion Area

Acceptable Soil Depth: 24 in. Test pit #'s: 19-24

Soil Application Rate (gal. /sq. ft. /day): 0.30

System Type(s) Recommended: Subsurface Drip with Pretreatment

Slope: 2-9%. Distance to nearest water source: > 100' to well
> 50' to reservoir

Hydrometer test performed? No ☒ Yes ☐ (attach results)

Bulk Density test performed? No ☒ Yes ☐ (attach results)

Percolation test performed? No ☒ Yes ☐ (attach results)

Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Site constraints/Recommendations:

Test Pit # 1

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-9	A	<20	SC	S/SB	S	FRB	NS-SS	C/F	M/F	N/A
	10-27	Bottom		C	M						

Notes:

Test Pit # 2

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-8	C	<20	SC	S/SB	S	FRB	SS	C/F	C/F	N/A
	8-18	Bottom		C	M						

Notes:

Test Pit # 3

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-10	C	<20	SC	S/SB	S	FRB	SS	C/R	M/F	N/A
	10-20	Bottom		C	M						

Notes:

Test Pit # 4

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-10	A	<20	SC	S/SB	SH	FRB	SS	M/F-C	C/F	N/A
	10-22	Bottom		C	M						

Notes:

Test Pit # 5

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-22	Bottom	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A

Notes:

Test Pit # 6

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-9	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	9-20	Bottom		C	M						

Notes:

Test Pit # 7

X = Limiting Horizon	Horizon Depth (inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-12	C	<20	SC	S/SB	SH	FRB	SS	M/F	C/F	N/A
	12-20	Bottom		C	M						

Notes:

Test Pit # 8

X = Limiting Horizon	Horizon Depth (inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-7	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	7-19	Bottom		C	M						

Notes:

Test Pit # 9

X = Limiting Horizon	Horizon Depth (inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-10	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	10-21	Bottom		C	M						

Notes:

Test Pit # 10

X = Limiting Horizon	Horizon Depth (inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-11	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	11-20	Bottom		Rock							Yes

Notes:

Test Pit # 11

X = Limiting Horizon	Horizon Depth (inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-10	C		SC							
	10-12	Bottom		Rock							

Notes:

Test Pit # 12

X = Limiting Horizon	Horizon Depth (inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-7	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	7-19	C	<20	SC	S/SB	SH	FRB	SS	C/R	F/R	N/A
	19-23	Bottom		Rock							

Notes:

Test Pit # 13

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-6	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	6-18	C	<10	SC	S/SB	SH	FRB	SS	C/F-C	C/F	N/A
	18-21	Bottom		Rock							

Notes:

Test Pit # 14

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-20	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	20-24	Bottom		Rock							Yes

Notes:

Test Pit # 15

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-15	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	14-16	A		Rock							Yes
	16-23	Bottom									

Notes:

Test Pit # 16

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-12	C	<20	SC	S/SB	SH	FRB	SS	M/F-C	C/F	N/A
	12-20	Bottom		Rock							

Notes:

Test Pit # 17

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-8	C	<20	SC	S/SB	SH	FRB	SS	C/F	M/F	N/A
	8-19	C	<10	SC	S/SB	SH	FRB	SS	C/F	F/F	N/A
	19-22	Bottom		Rock							

Notes:

Test Pit # 18

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-10	C	<20	SC	S/SB	SH	FRB	SS	C/F	C/F	N/A
	10-18	Bottom		Rock							

Notes:

Test Pit # 19

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-26	Bottom	<10	SC	S/SB	SH	FRB	SS	C/F	M/F-M	N/A

Notes:

Test Pit # 20

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-12	G	<10	SC	S/SB	SH	FRB	SS	C/F	FF	N/A
	12-29	Bottom	<5	SC	S/SB	SH	FRB	SS	C/F	C/F-M	N/A

Notes:

Test Pit # 21

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-26	Bottom	<10	SC	S/SB	SH	FRB	SS	M/F-M	C/F-M	N/A

Notes:

Test Pit # 22

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-26	Bottom	<10	SC	S/SB	SH	FRB	SS	M/F-M	C/F-M	N/A

Notes:

Test Pit # 23

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-27	Bottom	<10	SC	S/SB	SH	FRB	SS	M/F	C/F-M	N/A

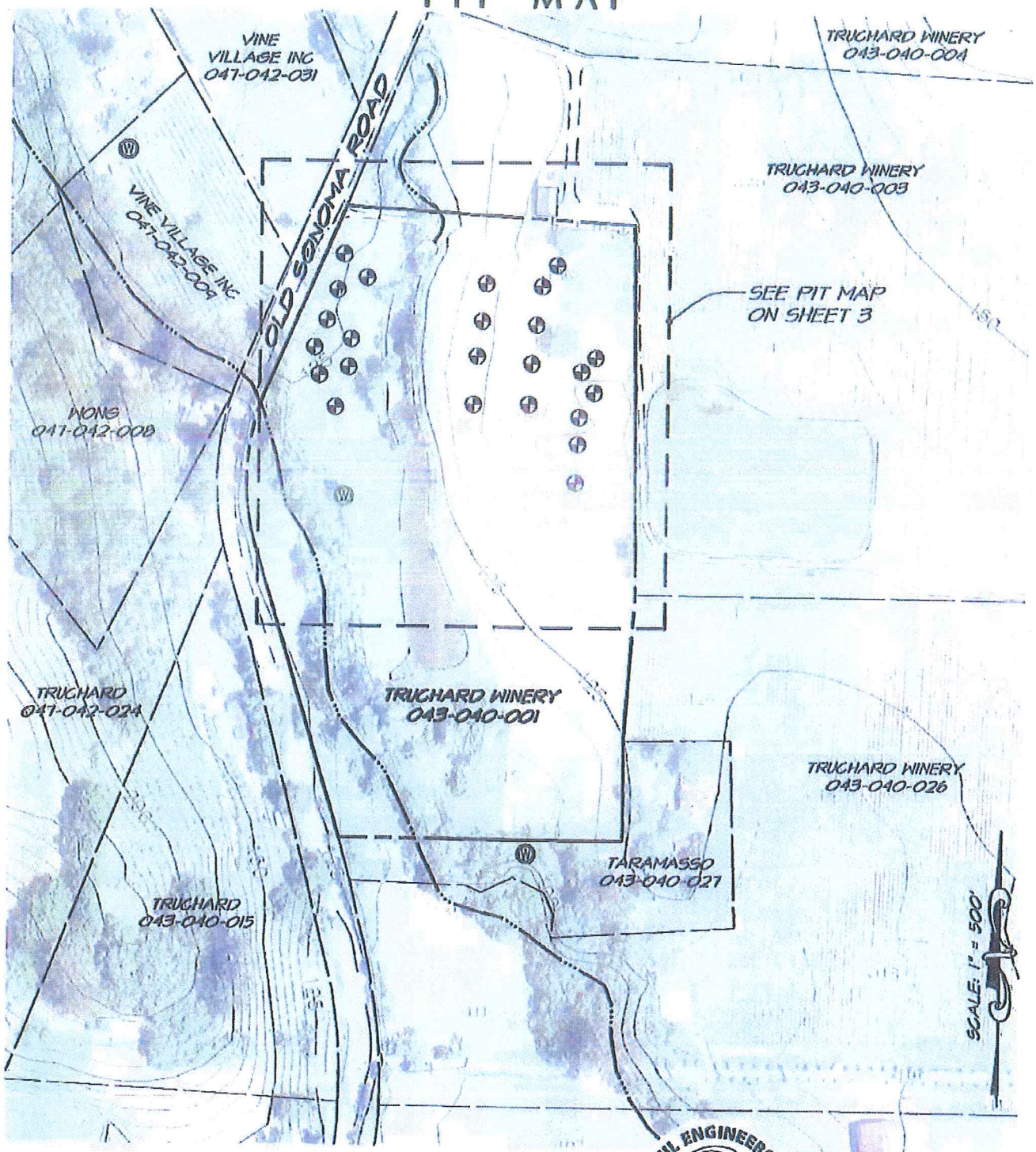
Notes:

Test Pit # 24

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size / Contrast)
						Side Wall	Ped	Wet			
	0-24	Bottom	<10	SC	S/SB	SH	FRB	SS	M/F-M	C/F-M	N/A

Notes:

TRUCHARD WINERY
PIT MAP



SITE EVALUATION DATE: AUGUST 28, 2013
APN: 043-040-001
ADDRESS: 4062 OLD SONOMA ROAD
NAPA, CALIFORNIA 94558
ENV. HEALTH INSPECTORS: MAUREEN SHIELDS BOWN

CONSULTING CIVIL ENGINEERS
RIECHERS SPENCE & ASSOCIATES
1515 Fourth Street
Napa, Calif. 94559
v 707.252.3301
f 707.252.4966

SEPTEMBER 6, 2013
4113042.0 Exh-Pitmap.dwg

Appendix 4

2015 Site Evaluation Report

Napa County Department of Environmental Management

SITE EVALUATION REPORT

Please attach an 8.5" x 11" plot map showing the locations of all test pits triangulated from permanent landmarks or known property corners. The map must be drawn to scale and include a North arrow, surrounding geographic and topographic features, direction and % slope, distance to drainages, water bodies, potential areas for flooding, unstable landforms, existing or proposed roads, structures, utilities, domestic water supplies, wells, ponds, existing wastewater treatment systems and facilities.

Permit #: E15-00200 and E15-00201
APN: 043-040-001 & 026
(County Use Only) Reviewed by: Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner Anthony Truchard	☒ New Construction ☐ Addition ☐ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address 3234 Old Sonoma Road	☐ Residential - # of Bedrooms: Design Flow : gpd
City State Zip Napa CA 94559	☒ Commercial – Type: Winery Sanitary Waste: 645 gpd Process Waste: gpd
Site Address/Location 4062 Old Sonoma Road Napa, CA 94559	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name RSA+	Evaluator's Name Jake Strickler	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist)
Mailing Address: 1515 Fourth Street		Telephone Number 707-252-3301
City State Zip Napa CA 94559		Date Evaluation Conducted April 2, 2015

Primary Area	**Expansion Area**
Acceptable Soil Depth: 24 in. Test pit #'s: 10, 11, 21	Acceptable Soil Depth: 24 in. Test pit #'s: 23, 24, 27
Soil Application Rate (gal. /sq. ft. /day): 0.3	Soil Application Rate (gal. /sq. ft. /day): 0.3
System Type(s) Recommended: subsurface drip with pretreatment	System Type(s) Recommended: subsurface drip with pretreatment
Slope: 2-9% Distance to nearest water source: >100 feet	Slope: 2-9% Distance to nearest water source: >100 feet
Hydrometer test performed? No ☒ Yes ☐ (attach results)	Hydrometer test performed? No ☒ Yes ☐ (attach results)
Bulk Density test performed? No ☒ Yes ☐ (attach results)	Bulk Density test performed? No ☒ Yes ☐ (attach results)
Percolation test performed? No ☒ Yes ☐ (attach results)	Percolation test performed? No ☒ Yes ☐ (attach results)
Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)	Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Site constraints/Recommendations:

Test Pit # 1 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-18	C	<10%	C	M/S-B	SH	FRB	S	M/F	M/F	N/A
X	18-38	Bottom	<10%	C	Massive						

Notes:

Test Pit # 2 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-14	C	<10%	C	M/S-B	SH	FRB	S	M/F	M/F	N/A
X	14-33	C	<10%	C	Massive						

Notes:

Test Pit # 3 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-15	C	<10%	SC	M/S-B	SH	FRB	SS	C/M	F/M	N/A
X	15-37	C	<10%	C	Massive	H					

Notes:

Test Pit # 4 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-22	C	<10%	SC	M/S-B	SH	FRB	S	C/M	F/F	N/A
X	22-36	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 5 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	<10%	SC	M/S-B	SH	FRB	SS	C/F	C/F	N/A
X	24-30	C	<10%	C	Massive						

Notes: Use not recommended by Napa County Environmental Health; High water content in soil

Test Pit # 6 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	<10%	SC	M/S-B	SH	FRB	SS	C/F	C/F	N/A
X	24-33	Bottom	<10%	C	Massive						

Notes:

Test Pit # 7 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-22	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	22-34	Bottom	<10%	C	Massive						

Notes:

Test Pit # 8 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-20	C	<10%	SC	M/S-B	SH	FRB	S	C/F	F/F	N/A
X	20-36	Bottom	<10%	C	Massive						

Notes:

Test Pit # 9 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	<10%	SC	M/S-B	SH	FRB	S	C/F	F/F	N/A
X	24-36	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 10 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/M	N/A
X	24-34	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 11 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/M	N/A
X	24-35	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 12 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-12	C	<10%	SC	M/S-B	SH	FRB	S	C/M	F/M	N/A
	12-36	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 13 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	<10%	SC	M/S-B	SH	FRB	S	C/F	F/M	N/A
X	24-37	Bottom	<10%	C	Massive						

Notes:

Test Pit # 14 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-18	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	18-33	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 15 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-16	C	10%	SC	M/S-B	SH	FRB	SS	C/M	C/M	N/A
	16-30	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 16 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-16	C	<10%	SC	M/S-B	SH	FRB	S	C/F	F/M	N/A
X	16-36	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 17 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-25	C	<10%	SC	M/S-B	SH	FRB	S	C/F	F/M	N/A
X	25-35	Bottom	<10%	C	Massive						Yes

Notes: Use not recommended by Napa County Environmental Health; High water content in soil

Test Pit # 18 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-18	C	<10%	SC	M/S-B	SH	FRB	S	F/M	F/F	N/A
X	18-37	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 19 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-15	C	<10%	SC	M/S-B	SH	FRB	S	M/M	F/M	N/A
X	15-36	Bottom	<10%	C	Massive						

Notes:

Test Pit # 20 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-17	C	<10%	SC	M/S-B	SH	FRB	S	C/F	F/F	N/A
X	17-40	Bottom	<10%	C	Massive						Yes

Notes:

Test Pit # 21 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	24-32	Bottom	<10%	C	Massive						

Notes:

Test Pit # 22 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-16	C	15%	C	M/S-B	H	FRB	S	F/C	F/F	N/A
X	16-30	Bottom	<10%	C	Massive						

Notes:

Test Pit # 23 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	24-30	Bottom	<10%	C	Massive						

Notes:

Test Pit # 24 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-25	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	25-30	Bottom	<10%	C	Massive						

Notes:

Test Pit # 25 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-14	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	14-34	Bottom	<10%	C	Massive						

Notes:

Test Pit # 26 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-18	C	<10%	SC	M/S-B	SH	FRB	S	C/F	C/F	N/A
X	18-32	Bottom	<10%	C	Massive						

Notes:

Test Pit # 27 **Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-24	C	10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	24-34	Bottom	<10%	C	Massive						

Notes:

Test Pit # 28 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-21	C	<10%	SC	M/S-B	SH	FRB	S	C/M	C/F	N/A
X	21-33	Bottom	<10%	C	Massive						

Notes:

Test Pit # 29 **No Good**

X = Limiting Horizon	Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure (Grade / Shape)	Consistence			Pores (QTY / Size)	Roots (QTY / Size)	Mottling (QTY / Size/ Contrast)
						Side Wall	Ped	Wet			
	0-22	C	15%	SC	M/S-B	SH	FRB	S	M/F	M/F	N/A
X	22-34	Bottom	<10%	C	Massive						

Notes:

TRUCHARD WINERY
VICINITY MAP

NAPA COUNTY CALIFORNIA

VICINITY MAP

SCALE: 1" = 5000'

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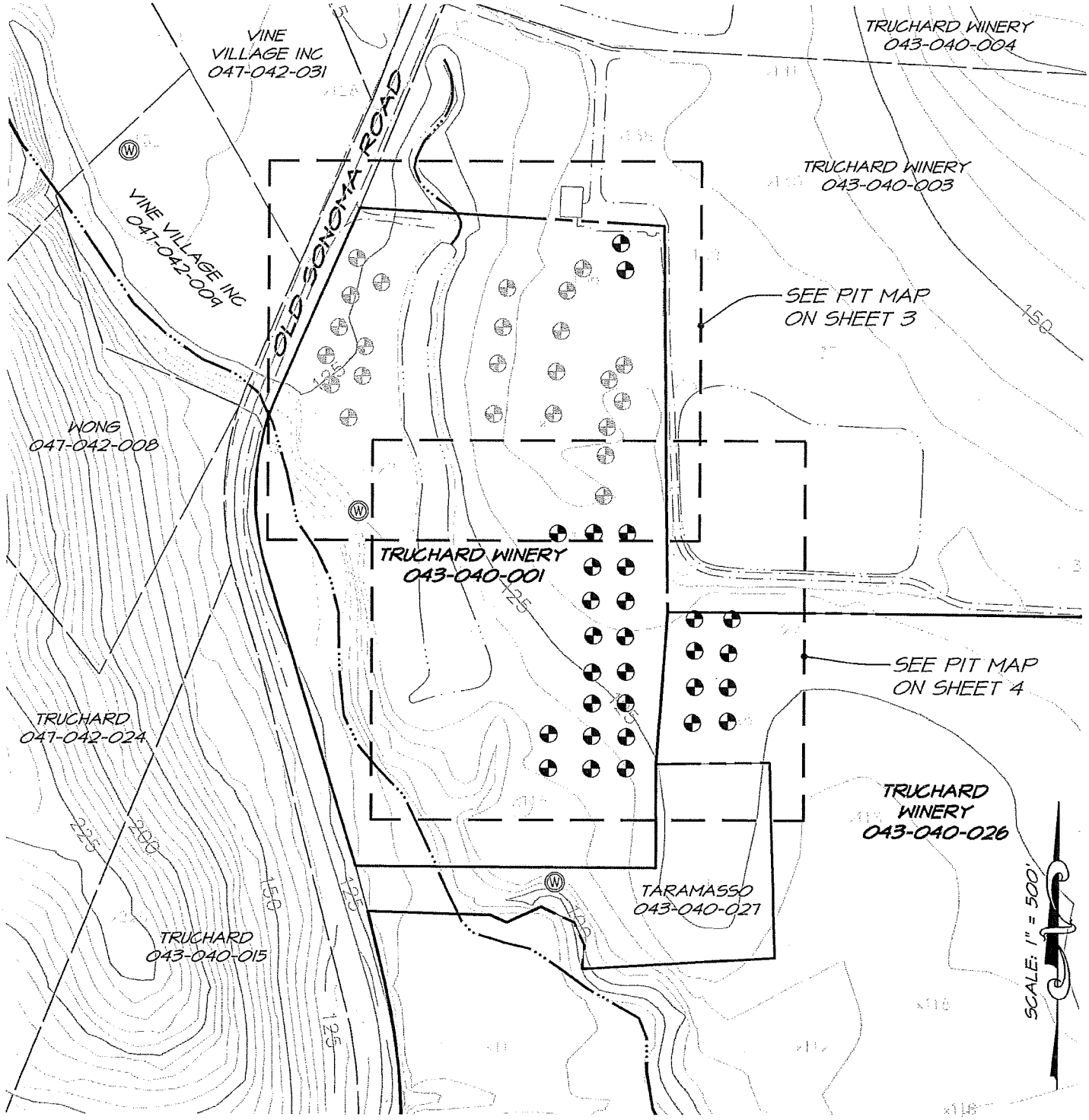
TRUCHARD WINERY
PIT MAP



SITE EVALUATION DATE: APRIL 2, 2015
APN: 043-040-001, -026
ADDRESS: 4062 OLD SONOMA ROAD
NAPA, CALIFORNIA 94558
ENV. HEALTH INSPECTORS: PETER EX

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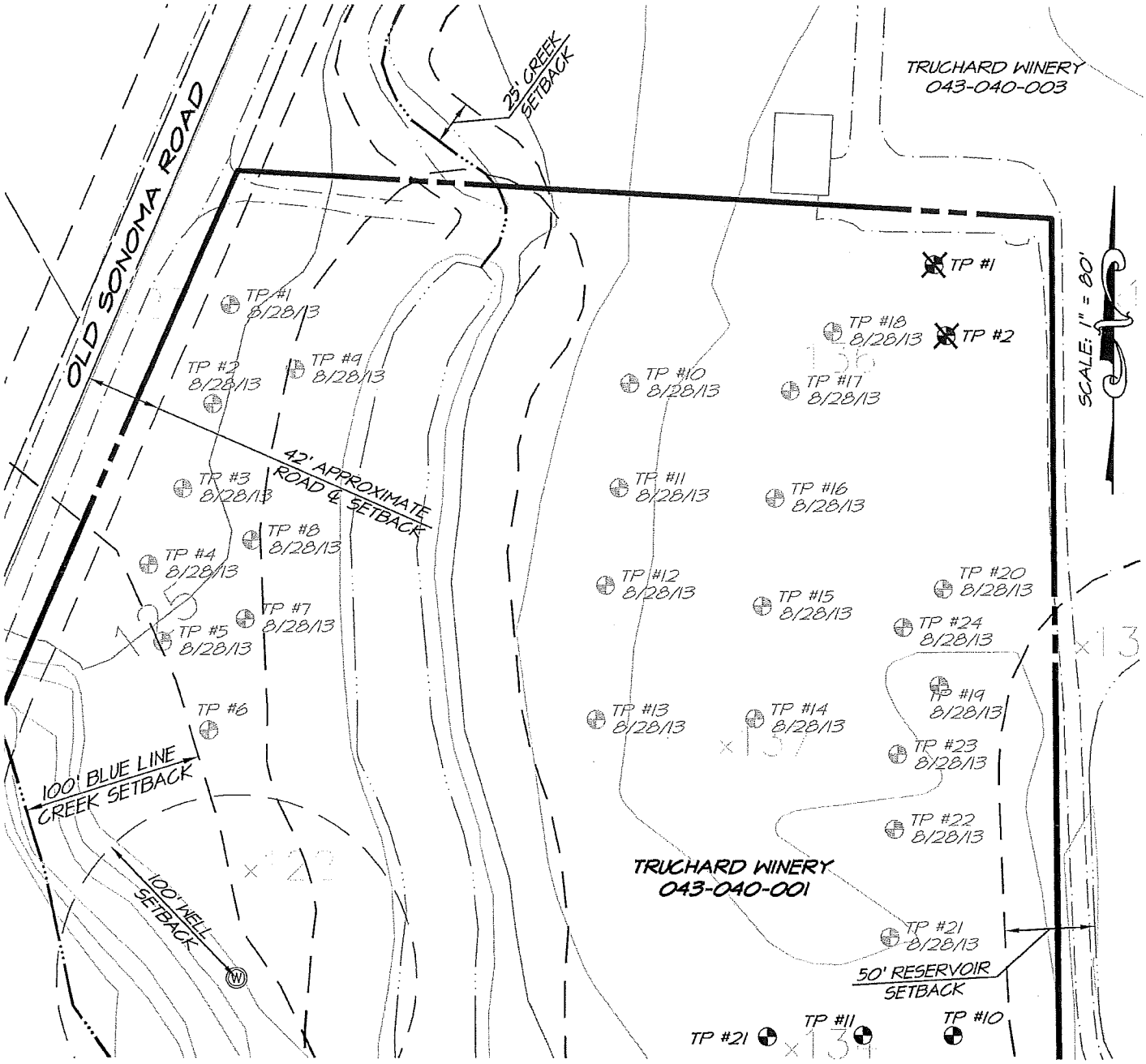
TRUCHARD WINERY
PIT MAP



LEGEND

- TP#1 — TEST PIT
- TP#1 — NO GOOD TEST PIT
- TP#1 DATE — OLD TEST PIT

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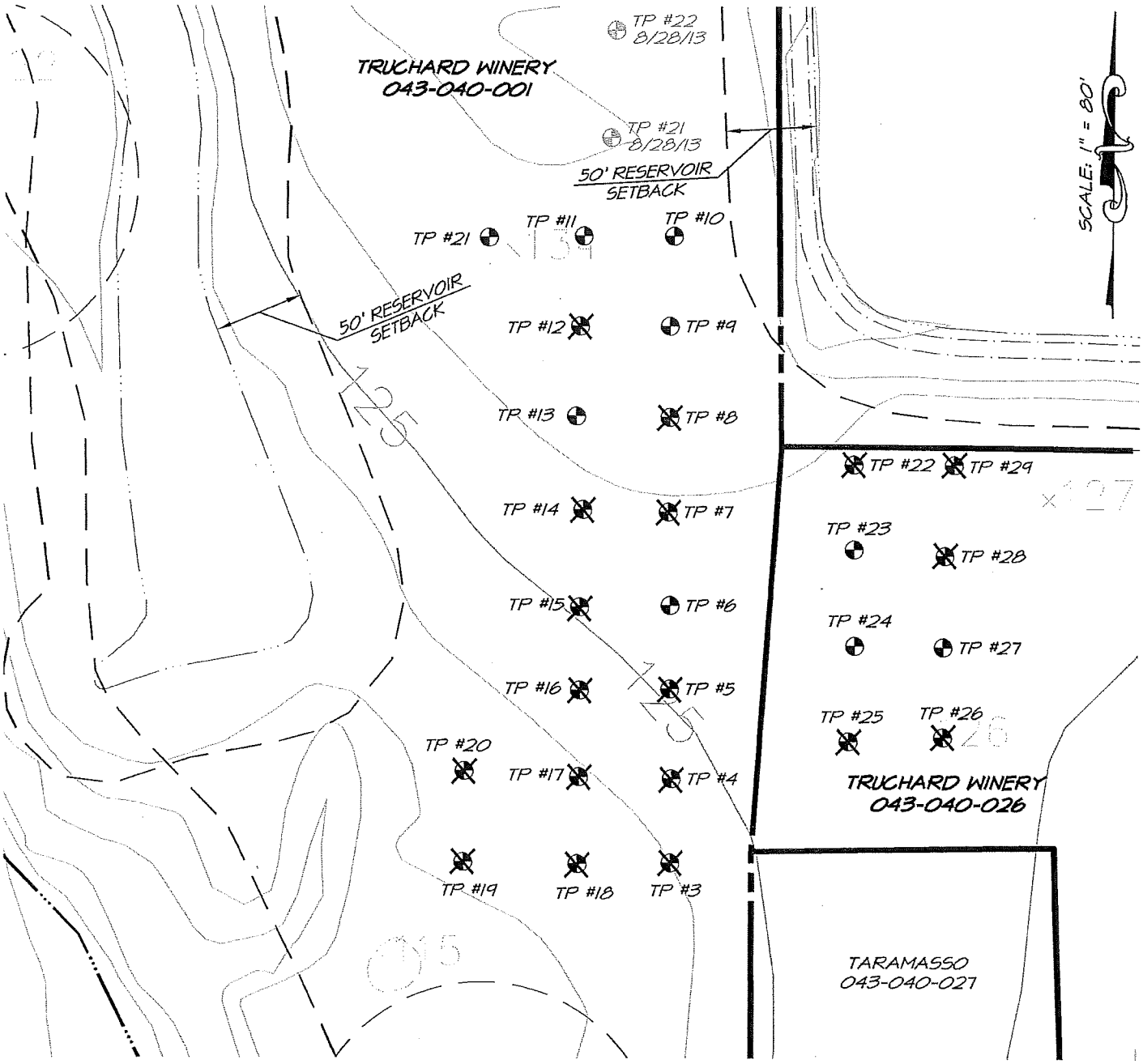
TRUCHARD WINERY
PIT MAP



LEGEND

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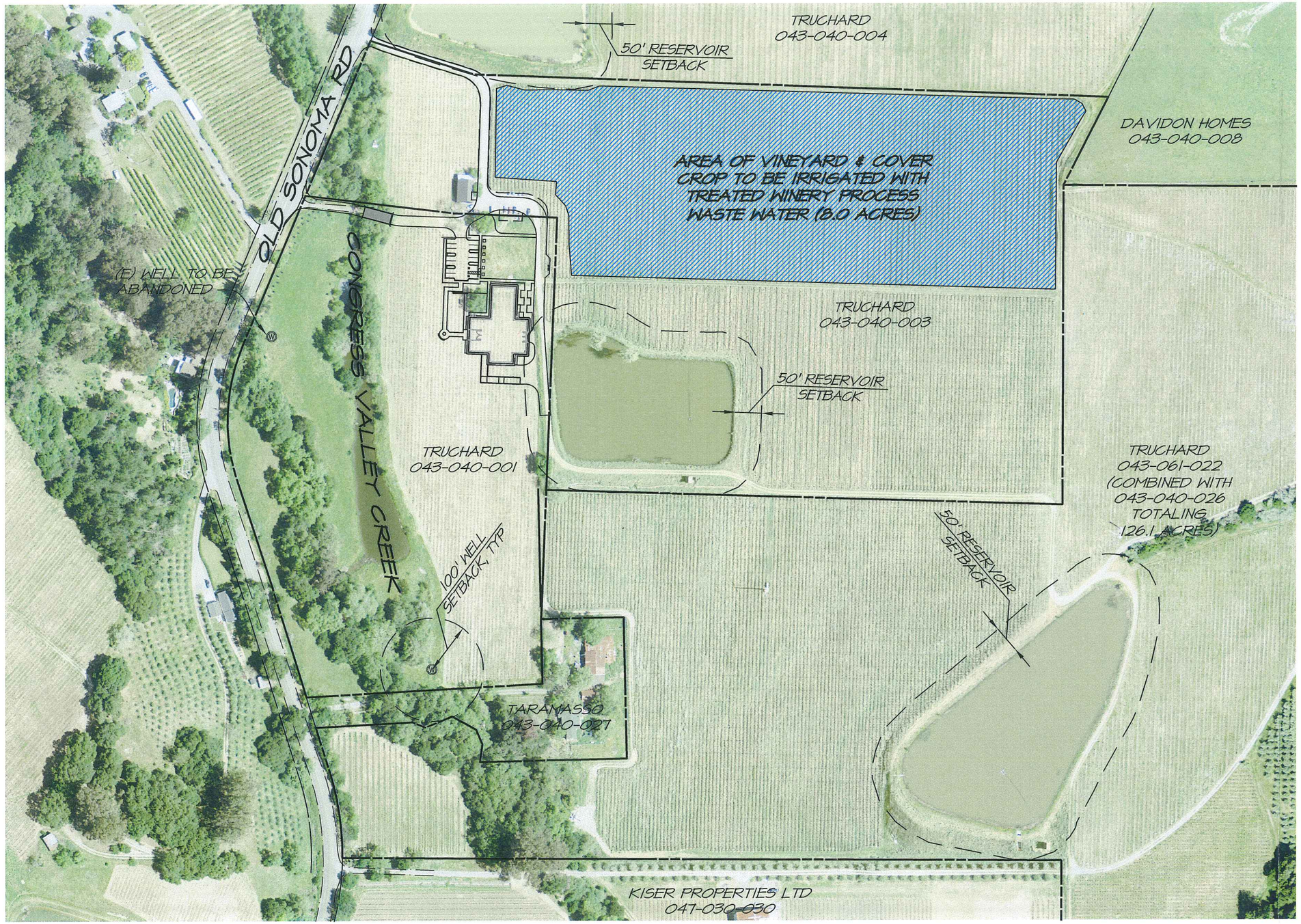
Appendix 5

Water Balance for Irrigation and Storage, Irrigation Areas Exhibit

TRUCHARD WINERY
VINEYARD IRRIGATION AREA



GRAPHIC SCALE

200 0 200 400

(IN FEET)
1 inch = 200 FT

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AUGUST 10, 2016 4113042.0 Exh-Vyd Irrig Area.dwg

TRUCHARD WINERY
Reclaimed Process Wastewater
Water Balance for Irrigation and Storage

Project Description		Annual Process Waste Flow Volume		
Project Number:	4113042.0	Wine Production:	100,000	gal/year
Project Name:	Truchard Winery			
Prepared By:	Jake Strickler	Annual Process Waste per Gallon Wine:	5	gal/year
Date:	August 19, 2014	Total Annual Process Waste Generated:	500,000	gal/year

Vineyard Irrigation Parameters		Landscape Irrigation Parameters		
Acres of irrigated vineyard:	8.00 acres	Crop type / name:	Native grass and trees	
Row spacing:	8.0 feet	Total irrigated acres of crop:	1.00 acres	
Vine spacing:	8.0 feet			
Total number of vines:	5,445 vines			
Water use per vine per month (peak):	26 gal			
Total peak monthly irrigation demand:	141,570 gal			

Monthly Process Wastewater Generation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly process wastewater generated as % of annual total:	4%	6%	6%	5%	6%	7%	9%	10%	14%	14%	11%	8%
Monthly process wastewater generated [gallons]:	20,000	30,000	30,000	25,000	30,000	35,000	45,000	50,000	70,000	70,000	55,000	40,000

Monthly Vineyard Irrigation Water Use

(Based on per-vine water use)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beginning of month reclaimed water in storage [gallons] (This number brought forward from end of previous month)	5,647	0	0	0	0	0	0	0	0	0	0	5,219
Vineyard irrigation as % of peak month irrigation demand:	6%	6%	10%	100%	100%	100%	100%	100%	100%	100%	10%	10%
Irrigation per month per vine (gallons):	2	2	3	26	26	26	26	26	26	26	3	3
Total vineyard irrigation demand [gallons]:	8,494	8,494	14,157	141,570	141,570	141,570	141,570	141,570	141,570	141,570	14,157	14,157
Will vineyard be irrigated with reclaimed water this month?	y	y	y	y	y	y	y	y	y	y	y	y
Process wastewater generated this month, reclaimed for vineyard irrigation [gallons]	8,494	8,494	14,157	25,000	30,000	35,000	45,000	50,000	70,000	70,000	14,157	14,157
Remaining vineyard irrigation demand after using this month's process water [gallons]	0	0	0	116,570	111,570	106,570	96,570	91,570	71,570	71,570	0	0
Drawdown from storage for remaining vineyard irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Well water required to satisfy remaining vineyard irrigation demand	0	0	0	116,570	111,570	106,570	96,570	91,570	71,570	71,570	0	0
Net storage after vineyard irrigation drawdown [gallons]	5,647	0	0	0	0	0	0	0	0	0	0	5,219
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons]	11,506	21,506	15,843	0	0	0	0	0	0	0	40,843	25,843

Water balance continues on next page for cover crop irrigation.

Monthly Landscape Irrigation Water Use

(Based on evapotranspiration crop demand and irrigated area)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons] *(From sheet 1)*	11,506	21,506	15,843	0	0	0	0	0	0	0	40,843	25,843
Reference ET (ETo) (in/month) (see note 1)	1.03	1.53	2.93	4.71	5.82	6.85	7.21	6.44	4.87	3.53	1.64	1.17
Crop Coefficient (k_c) (see note 2)	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Crop water demand per acre [inches]	0.82	1.22	2.34	3.77	4.66	5.48	5.77	5.15	3.90	2.82	1.31	0.94
Crop water demand per acre [gallons]	22,374	33,235	63,645	102,310	126,422	148,795	156,615	139,889	105,786	76,678	35,624	25,415
Total crop water demand for irrigated area [gallons]	22,374	33,235	63,645	102,310	126,422	148,795	156,615	139,889	105,786	76,678	35,624	25,415
Will landscape be irrigated with reclaimed water this month?	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y
Process wastewater remaining after vineyard irrigation, reclaimed for landscape irrigation [gallons]	11,506	21,506	15,843	0	0	0	0	0	0	0	35,624	25,415
Landscape irrigation water required from storage or other source [gallons]	10,868	11,729	47,802	0	0	0	0	0	0	76,678	0	0
Drawdown from storage for landscape irrigation [gallons]	5,647	0	0	0	0	0	0	0	0	0	0	0
Process wastewater generated this month, unused for irrigation, to be reclaimed and stored [gallons]	0	0	0	0	0	0	0	0	0	0	5,219	428
Net end-of-month reclaimed water storage after all irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	5,219	5,647

End of Water Balance

Peak Monthly Storage = 5,647 gallons

Notes:

1. Reference ETo from California Irrigation Management Information System
2. Crop Coefficient from Table 1 of "Estimating Irrigation Water Needs of Landscape Plantings in California", University of California Cooperative Extension, August 2000.