



April 29, 2015

8091.01

Napa County Planning, Building and Environmental Services  
1195 3<sup>rd</sup> Street  
Napa, California 94559

Attention: Mr. Jason R. Hade, AICP  
Project Planner

Subject: Septic Feasibility Report  
Proposed Tench Winery  
7631 Silverado Trail, Napa, California  
APN 031-070-006  
Use Permit No. P15-00001

Dear Mr. Hade:

In response to your letter of January 30, 2015, LACO Associates, Inc. (LACO) has prepared this Septic Feasibility Report to describe the proposed method of sewage and process wastewater treatment and disposal for the subject project. Its specific intent is to clarify, correct, or supplement information presented in a Site Evaluation Report prepared by LACO and provided as Section 4.2 of the Use Permit application issued to Napa County Planning, Building & Environmental Services on January 2, 2015.

Sincerely,  
LACO Associates

A handwritten signature in blue ink, appearing to read "J. Erich Rauber".

J. Erich Rauber, P.E., G.E.  
Senior Geotechnical Engineer

JER/NKT:adg

P:\8000\8091 Tench Winery\8091.01 Use Permit Application\08 Geology\Wastewater Evaluations\8091.01 Septic Feasibility Report 20150402.docx

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## 1.0 INTRODUCTION

Tench Winery LLC (Applicant) is applying to the County of Napa for a Use Permit to operate a winery on an approximate 60 acre parcel at 7631 Silverado Trail in Napa County, California (Figure 1). This report has been prepared to estimate the wastewater flows generated by the operation of the winery, and to evaluate the feasibility of constructing a wastewater disposal system to serve the domestic and winery wastewater generated by the proposed project. As shown in Appendix 1, the proposed wastewater disposal area is west of the planned winery on a southwest facing slope.

The winery will consist of a winery building and associated caves. It will be a full crushing, fermenting, and barrel aging facility. The winery will generate up to 42,840 gallons of wine, annually. A typical day will consist of six full-time employees and one seasonal employee. The maximum staffing level will be ten employees, which will include four seasonal employees. The winery marketing plan calls for up to 14 visitors per day, as well as three special events per year with a maximum of 50 visitors per event. During the 60-day harvest period, up to 10 visitors are planned. No events will occur during the 60-day harvest period, and no visitors will be received during. Plumbing fixtures in the proposed winery shall be low flow, water-saving fixtures per the Uniform Plumbing Code as adopted by the Napa County Building Department.

## 2.0 WASTEWATER FLOW

This section presents waste water flow estimates for the planned winery. The two primary wastewater generators are domestic and winery process wastewater. The contributions of each of these wastewater sources are described in the following sections.

### 2.1 Domestic

Peak daily domestic wastewater flows for the break room are summarized in Table 1. They are based on the maximum number of employees and visitors during harvest and non-harvest periods. The values used for the projected wastewater generation are based on the Napa County Department of Environmental Management guidelines<sup>1</sup>. The event flows and harvest flows have not been combined because no events will be held during the 60 day harvest period.

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<sup>1</sup> Table 4, Napa County Environmental Management Regulations for Design, Construction, and Installation of Alternative Sewage Treatment System.

Table 1. Domestic Wastewater Flow Estimates

Average Non-Harvest, Tasting, without Event							
Employee (full time)	6	x	15	gpcd	=	90	gpd
Employee (part time)	1	x	15	gpcd	=	15	gpd
Tasting Visitors	14	x	3	gpcd	=	42	gpd
Total						147	gpd
Average Harvest, Tasting, without Event							
Employee (full time)	6	x	15	gpcd	=	90	gpd
Employee (part time)	4	x	15	gpcd	=	60	gpd
Tasting Visitors	10	x	3	gpcd	=	30	gpd
Total						180	gpd
Average Non-Harvest, Tasting with Event							
Employee (full time)	6	x	15	gpcd	=	90	gpd
Employee (part time)	1	x	15	gpcd	=	15	gpd
Tasting Visitors	0	x	3	gpcd	=	0	gpd
Peak Event (catered)	50	x	3	gpcd	=	150	gpd
Total						255	gpd

As shown, the total anticipated peak domestic flow is 255 gallons per day (gpd) during harvest and 180 gpd during non-harvest periods.

## 2.2 Winery Process

### Peak Flow (Harvest Period)

Using the Napa County method for determining the peak process effluent from a winery, the peak flow is estimated to be:

$$\text{Harvest Peak Flow} = \frac{\left(\frac{42,840 \text{ gal wine}}{\text{year}}\right) \left(\frac{1.5 \text{ gal water}}{\text{gal wine}}\right)}{60 \text{ days} \frac{\text{crush}}{\text{year}}} = 1,071 \text{ gpd}$$

A 60-day harvest period was used based on our discussions with Russell Bevan, winemaker for the Tench Winery, who indicated that several different varietals will be crushed at the winery and these varietals tend to have different harvest dates that will span approximately 60 days.

### Average Daily Flow

Depending on the winery, the amount of wastewater generated per gallon of wine produced typically ranges from 3-10 gallons, per gallon of wine produced. This variation is based on the individual winery water conservation practices. This variation is based on the individual winery water conservation practices. We have estimated, for this project, that six gallons of process effluent shall be produced for each gallon of wine produced. Using a method which ties the amount of process wastewater generated to each gallon of wine produced, the average daily flow is estimated to be:

$$\text{Average Daily Flow} = \frac{\left(\frac{42,840 \text{ gal wine}}{\text{year}}\right) \left(\frac{6 \text{ gal water}}{\text{gal wine}}\right)}{365 \text{ days} \frac{\text{crush}}{\text{year}}} = 704 \text{ gpd}$$

Using the County Peak Harvest Method, the estimated total peak flow of 1,071 gpd is to occur during harvest, with an average day producing 704 gallons of process wastewater assuming that 6 gallons of wastewater are produced per gallon of wine. A process wastewater flow of 1,071 gpd was used in our evaluations. Thus, the total design wastewater flow is:

$$\text{Total Design Wastewater Flow} = 1,071 \text{ gpd} + 180 \text{ gpd} = 1,251 \text{ gpd}$$

The peak domestic flow is 255 gpd (Section 2.1) which occurs during the non-harvest period. Because the peak process flow occurs during harvest, we used the peak harvest domestic flow of 180 gpd to calculate the total design waste water flow of 1,251 gpd.

### 3.0 SITE EVALUATION

This feasibility study is based on the Site Evaluation performed on October 16, 2014, by LACO Associates, Inc. and field reviewed by Ms. Kim Withrow, a supervisor with Napa County Division of Environmental Health (EH). A total of 16 test pits were excavated. The test pits extended approximately four feet below ground surface, and were logged using the Feel Method and did not require laboratory testing. Test pit logs are presented in the Site Evaluation Report, which was issued to EH on January 2, 2015, as Section 4.2 of the project Use Permit Application. A revised Site Evaluation Report was on issued to EH for approval on February 25, 2015, and is included as Appendix 1 to this report.

As shown, soil conditions encountered in the test pits typically consisted of a loamy sand over the upper 24 inches and grading to silty loam or silty clay loam below 24 inches. The gravel content in all pits was less than 50 percent. No evidence of present or previous high groundwater was observed in the test pits. Bedrock was encountered at depths of four feet or less in five of the 16 test pits (TP-2, 10, 11, 15, and 16).

For a standard system, the results of the soil evaluation and Napa County guidelines indicate a soil application rate for the disposal area of 0.5 gallons/day ft<sup>2</sup> of trench sidewall is appropriate for use in the planned disposal area. Wastewater distribution would be via serial distribution boxes into 18 inch wide trenches using Quick 4 Equalizer 24 low profile chambers manufactured by Infiltrator Systems Inc. With a 48 inch thick infiltration zone and 12 inches of cover over the 8-inch high chamber allows for 2.33 gpd/ft.

$$\text{Trench length required} = 1,251 \text{ gpd} \div 2.33 \text{ gpd/ft} = 537 \text{ lineal feet}$$

The primary disposal is required to provide 537 lineal feet of trench, Thus, the primary distribution system will consist of six (6) pressure distribution trenches, each 90 feet in length which provides 540 feet of distribution trenches. The 100 percent reserve area will require an area capable of providing the same total trench length. These areas are shown on Figure 2 of the Site Evaluation Report (Appendix 1).

## 4.0 WASTEWATER DESIGN OVERVIEW

The domestic and process effluent from the winery will be a multistage process. Initially, the effluent from each source will be treated via separate septic tanks for solids settling (primary treatment). The septic tanks will be fitted with effluent filters. After primary settling, the two effluent streams will be combined and pumped to the top of the hill for disposal via gravity distribution through a dosing system to the disposal field trenches.

## 5.0 CONCLUSIONS

Napa County design guidelines dictate the type of distribution system along with the design wastewater application rate. Based on the available soil depth encountered in each test pit, the treated domestic and process effluent can be disposed of via a standard, or an alternative sewage treatment system (ASTS). The type and configuration of the disposal system will be determined during design.

## APPENDIX 1

### **Site Evaluation Report**



**PLEASE PRINT OR TYPE ALL INFORMATION**

## Test Pit # 1

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-12	--	<50	LS	W/G	L	L	NS	C/M	C/M	None
12-36	G	25	SiL	W/G	S	VFRM	SS	C/F	F/C	None
36-48+	G	25	SiCL	M/G	SH	FRB	SS	F/F	F/F	None

## Test Pit # 2

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/C	F/M	None
24-48+	C	100	Bedrock	--	--	--	--	--	--	--

## Test Pit # 3

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/C	C/F	None
24-48+	G	25	SiL	W/G	L	L	NS	C/F	F/F	None

## Test Pit # 4

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/M	C/M	None
24-48+	G	25	SiL	M/G	L	VFRB	NS	C/F	F/M	None

## Test Pit # 5

Page 3 of 4

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/M	C/C	None
24-48+	G	25	LS	M/PI	SH	FRB	NS	M/VF	F/F	None

## Test Pit # 6

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/M	C/C	None
24-48+	G	25	LS	S/AB	H	F	NS	F/F	F/C	None

## Test Pit # 7

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/F	C/C	None
24-48+	G	25	SiL	M/G	SH	FRB	NS	C/F	F/M	None

## Test Pit # 8

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-36	--	<50	LS	W/G	L	L	NS	M/M	C/M	None
36-48+	G	25	SiL	W/G	L	VFRB	NS	F/F	F/M	None

## Test Pit # 9

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-36	--	<50	LS	W/G	L	L	NS	M/M	C/M	None
36-48+	G	25	SiL	W/G	L	VFRB	NS	F/F	F/M	None

## Test Pit # 10

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	LS	W/G	L	L	NS	M/M	M/F	None
24-48+	C	100	Bedrock	--	--	--	--	--	--	--

## Test Pit # 11

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-48	--	<50	LS	W/G	L	L	NS	M/M	M/F	None
48+	C	100	Bedrock	--	--	--	--	--	--	--

## Test Pit # 12

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	SL	W/G	L	L	NS	M/F	C/F	None
24-48+	G	25	SiL	M/G	S	VFRB	SS	F/F	F/VF	None

## Test Pit # 13

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-24	--	<50	SL	W/G	L	L	NS	M/M	F/F	None
24-48+	G	25	SCL	M/G	L	VFRB	SS	F/VF	F/F	None

## Test Pit # 14

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-36	--	<50	SL	W/G	L	L	NS	M/M	M/C	None
36-48+	G	25	SL	M/G	SH	FRB	NS	F/F	F/F	None

## Test Pit # 15

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-18	--	<50	SL	W/G	L	L	NS	M/M	C/M	None
18-48	G	25	SL	M/G	SH	FRB	NS	C/F	F/F	None
48+	C	100	Bedrock	--	--	--	--	--	--	--

## Test Pit # 16

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistency			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-12	--	<50	SL	W/G	L	L	NS	M/M	C/M	None
12-48+	C	100	Bedrock	--	--	--	--	--	--	--

Waste Water Volume Estimate  
Tench Winery, Napa, California

*Facility Information*

Winery Production = 42,840 gallons/year  
Production Period = 60 days

*Calculations*

Waste Water Use

Process =	1,071 gallons/day	(42,840 gallon/yr * 1.5/60 days)
Sewage =	180 gallons/day	(See Page 2)
Total =	<u>1,251 gallons/day</u>	

Available Area =	4.67 ft <sup>2</sup> /ft. (18" wide trench & 28" sidewalls)*
Application Rate (standard system) =	0.5 gallons/ft <sup>2</sup> /day
Required Length of Leach Field =	536 feet
Center to Center Spacing =	10 feet

Primary =	7 lines @ 10 ft c.c. 80 feet long
Expansion =	6 lines @ 10 ft c.c. 95 feet long

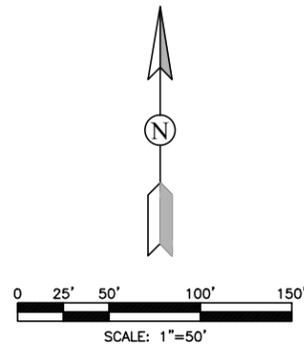
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\* 28 inch side wall assumes the following:

- Infiltrator Quick4 Equalizer 24 Low Profile chamber -- 18" wide with 8" chamber height
- 48" - 12" soil cover - 8 inch chamber height = 28"

## Sanitary Waste Water Flow Estimates

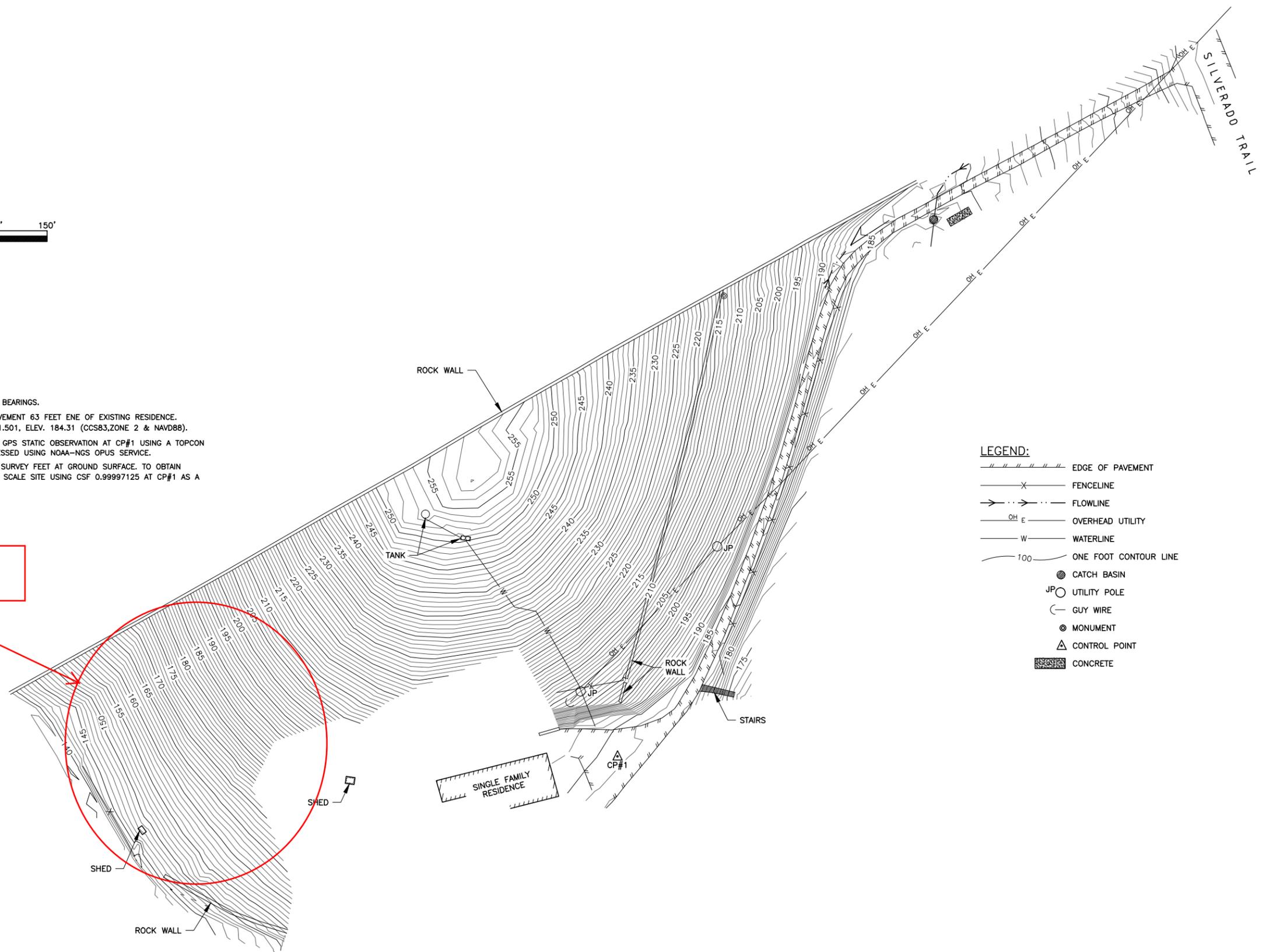
						<u>Frequency</u>
<u>Average Non-Harvest Tasting Day w/o Event</u>						302 days/year
Employee (full time)	6	x	15 gpcd	=	90 gal/day	
Employee (part time)	1	x	15 gpcd	=	15 gal/day	
Tasting Visitors	14	x	3 gpcd	=	42 gal/day	
Total					147 gal/day	
<u>Average Harvest Tasting w/o Event</u>						60 days/year
Employee (full time)	6	x	15 gpcd	=	90 gal/day	
Employee (part time)	4	x	15 gpcd	=	60 gal/day	
Tasting Visitors	10	x	3 gpcd	=	30 gal/day	
Total					180 gal/day	
<u>Non-Harvest Tasting w/ Event</u>						3 days/year
Employee (full time)	6	x	15 gpcd	=	90 gal/day	
Employee (part time)	1	x	15 gpcd	=	15 gal/day	
Tasting Visitors	0	x	3 gpcd	=	0 gal/day	
Peak Event (catered)	50	x	3 gpcd	=	150 gal/day	
Total					255 gal/day	
<u>Harvest Average Tasting w/ Event</u>						0 days/year
Employee (full time)	6	x	15 gpcd	=	90 gal/day	
Employee (part time)	4	x	15 gpcd	=	60 gal/day	
Tasting Visitors	10	x	3 gpcd	=	30 gal/day	
Peak Event (catered)	50	x	3 gpcd	=	150 gal/day	
Total					330 gal/day	
DESIGN FLOW					=	55,960 gal/year
					=	0.172 ac-ft/yr



**SURVEYOR'S NOTES:**

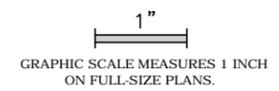
1. BASIS OF BEARING: CCS83, ZONE 2 GRID BEARINGS.
2. CONTROL POINT #1: SET MAG NAIL IN PAVEMENT 63 FEET ENE OF EXISTING RESIDENCE.  
NORTHING: 1926629.887, EASTING: 6457411.501, ELEV. 184.31 (CCS83, ZONE 2 & NAVD88).
3. BASIS OF ELEVATION: NAVD88 BASED ON A GPS STATIC OBSERVATION AT CP#1 USING A TOPCON HIPER G6 RECEIVER, RESULTS WERE PROCESSED USING NOAA-NGS OPUS SERVICE.
4. SITE MAPPING AND COORDINATES ARE U.S. SURVEY FEET AT GROUND SURFACE. TO OBTAIN CCS83, ZONE 2 VALUES FOR COORDINATES SCALE SITE USING CSF 0.99997125 AT CP#1 AS A POINT OF ORIGIN.

Wastewater disposal area



**LEGEND:**

- EDGE OF PAVEMENT
- FENCELINE
- FLOWLINE
- OVERHEAD UTILITY
- WATERLINE
- ONE FOOT CONTOUR LINE
- CATCH BASIN
- UTILITY POLE
- GUY WIRE
- MONUMENT
- CONTROL POINT
- CONCRETE



DRAFT

LACO

EUREKA • UKIAH • SANTA ROSA

1-800-515-5054 www.lacocoassociates.com

NO.	HISTORY / REVISION	BY / CHK.	DATE

TENCH WINERY COMPLEX  
TOPOGRAPHIC MAP

TENCH VINEYARDS  
7631 SILVERADO TRAIL, NAPA, CA

DRAWN	JDB
CHECK	SKD
APPROVED	SKD
DATE	9/18/14
JOB NUMBER	8091.00
SHEET	



Wastewater  
Disposal Area

Google earth

Google earth



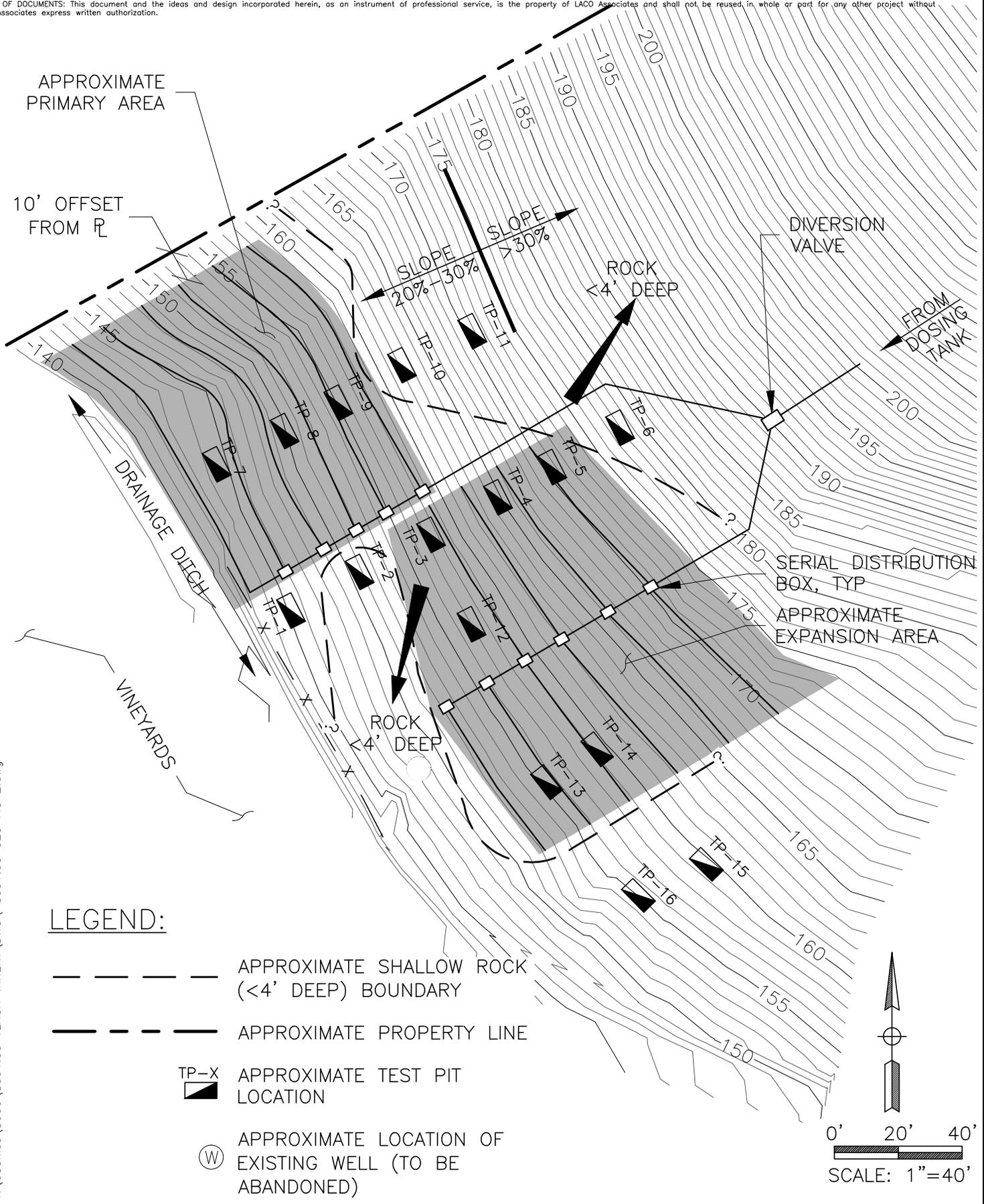
# LACO

EUREKA • UKIAH • SANTA ROSA

1-800-515-5054 www.lacoassociates.com

PROJECT	TENCH WINERY	BY	JDB	FIGURE	2
CLIENT	TENCH WINERY, LLC	DATE	2/24/15		
LOCATION	7631 SILVERADO TRAIL, NAPA, CA	CHECK	JER	JOB NO.	8091.01
	SITE PLAN	SCALE	AS SHOWN		

REUSE OF DOCUMENTS: This document and the ideas and design incorporated herein, as an instrument of professional service, is the property of LACO Associates and shall not be reused, in whole or part for any other project without LACO Associates express written authorization.



Apr 17, 2015 10:06am T:\codfiles\8000\8091.00 TENCH WINERY\DWG\ 8091.00 GEO FIG 2.dwg