Wastewater Feasibility Study

Baldacci Family Vineyards (P15-00422-UP & P16-00295-VIEW)
Planning Commission Hearing, February 15, 2017

WASTEWATER FEASIBILITY STUDY

BALDACCI FAMILY VINEYARDS

6236 Silverado Trail, Napa, California

APN 031-230-006

SUMMIT

CIVIL STRUCTURAL ELECTRICAL WATER|WASTEWATER

Project No. 2015167
December 22, 2015
Revised March 24, 2016
Revised June 13, 2016

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LIST OF ENCLOSURES

PROJECT OVERVIEW

Baldacci Family Vineyards is applying for a Use Permit modification for improvements to an existing winery facility located at 6236 Silverado Trail, in Napa (APN 031-230-006). The project site is located approximately 1 mile east of the Napa River, and 0.5 miles south of Yountville Crossroad. The project site extends over a gently sloping terrain along the valley floor, sloping southwest at approximately 3% or less towards the Napa River.

Baldacci Family Vineyards is made up of a single 28.72 acre parcel, with approximately 17.58 acres of existing vineyard. The parcel has an existing winery building, a wine cave, an existing 5 bedroom residence, an existing 3 bedroom farmworker residence, and a garage. The Use Permit Application includes the expansion of an existing winery facility in order to produce 40,000 gallons of wine per year. The expanded winery will require 10 full-time employees, and anticipates a maximum of 100 tasting visitors per day. Additional visitors are also proposed for private and public events, as outlined in the sanitary sewage (SS) management system section.

The existing sanitary sewage (SS) and process wastewater (PW) systems serving the winery and the farmworker residence will be replaced by new treatment and disposal system; the PW and SS systems will either be combined or separated. Baldacci Family Vineyards is also presenting the option of connecting the existing 5 bedroom residence to the new SS system. Summit Engineering has prepared the following Wastewater Feasibility Study outlining the proposed PW and SS flows, and associated treatment and disposal systems.

SITE EVALUATION RESULTS

A site evaluation was performed by Summit Engineering and Napa County Registered Environmental Health Specialist (REHS) Rebecca Setliff on November 4, 2015. Twelve soil profiles were excavated within the vineyard block on the north east portion of the property, adjacent to the Napa River. Please refer to the attached site map for the soil profile locations. The soil profiles in the vicinity of the proposed disposal area displayed acceptable soil to a depth of 42 inches. These soils were classified as sandy loam, and sandy clay loam with weak to moderate sub-angular blocky structure, and corresponding hydraulic loading rates of 0.5 gpd/sf for septic tank effluent (STE) and 0.75 gpd/sf for pre-treated effluent (PTE). See Enclosure C for the Site Evaluation Report.

WINERY PROCESS WASTEWATER MANAGEMENT SYSTEM

To accommodate a proposed annual production of 40,000 gallons of wine, the new PW management system will include a gravity collection system within the new winery, screened floor drains for solids removal, a PW pump station, and treatment and disposal through one of the following alternatives:

1. Treatment through a package treatment system and in-ground disposal via a subsurface drip dispersal system, either combined with SS or separated.
2. Treatment through a high rate package treatment system, storage of treated PW, and surface reuse for vineyard irrigation.

PROCESS WASTEWATER CHARACTERISTICS

Process wastewater will consist primarily of wastewater collected at floor drains and trenches within the winery, receiving, crush, tank, and wash down areas. All exterior tank and process areas will be covered and graded to preclude stormwater from entering the PW collection system. Typical winery wastewater characteristics are summarized below:

TABLE 1.TYPICAL WINERY PROCESS WASTEWATER CHARACTERISTICS

Characteristic	Units	Crushing Season Range	Non-crushing Season Range
pH	--	2.5 - 9.5	3.5 - 11.0
Dissolved Oxygen	mg/L	0.5 - 8.5	1.0 - 10.0
BOD_s	mg/L	500 – 12,000	300 – 3,500
COD	mg/L	800 – 15,000	500 – 6,000
Grease	mg/L	5 - 30	5 - 50
Settleable Solids	mg/L	25 - 100	2 - 100
Nonfilterable Residue	mg/L	40 - 800	10 - 400
Volatile Suspended Solids	mg/L	150 - 700	80 - 350
Total Dissolved Solids	mg/L	80 – 2,900	80 – 2,900
Nitrogen	mg/L	1 - 40	1 - 40
Nitrate	mg/L	0.5 - 4.8	-
Phosphorous	mg/L	1 - 10	1 - 40
Sodium	mg/L	35 - 200	35 - 200
Alkalinity ($CaCO_3$)	mg/L	40 - 730	10 - 730
Chloride	mg/L	3 - 250	3 - 250
Sulfate	mg/L	10 - 75	20 - 75

PROCESS WASTEWATER DESIGN FLOWS

Based on typical flow data from wineries of similar size and characteristics and corresponding process wastewater (PW) generation rates, projected flows are calculated as follows:

Annual Volume

Annual Production	=	40,000	gal wine/year
Generation Rate (assumed)[a]	=	165	gal wine/ton grapes
Tons Crushed	=	242	tons grapes/year
Process Wastewater (PW) Generation Rate [b]	=	6.00	gal PW/gal wine
Annual PW Flow	=	*240,000*	*gal PW/year*
Average Day Flow	=	***658***	***gal PW/day***

Napa County Peak Day Flow

Peak Harvest Day Flow (45 day harvest)	=	***1,400***	***gal PW/day***

Average Day Peak Harvest Month Flow

The harvest month of September accounts for approximately 16.4 percent of the annual PW flow.

Peak Flow	=	*1,312*	*gal PW/day*
	=	***1,400***	***gal PW/day***

Average Day Peak Week Crush Flow

Tons Crushed [c]	=	*73*	*tons/peak week*
Generation Rate (assumed)	=	*225*	*gal PW/ton*
Peak Flow	=	*2,338*	*gal PW/day*
	=	***2,400***	***gal PW/day***

Notes:

a. 165 Gal wine per ton of grapes is used as a wine industry standard
b. 6.0 gal of PW per gallon wine produced over the course of 1 year is based on the average of data from approximately 16 wineries.
c. Assumes 30% of total annual tonnage is crushed in one week.

The PW design flow will account for the most conservative approach; therefore 2,400 gpd will be used for preliminary system sizing as outlined below.

PROCESS WASTEWATER CONVEYANCE, TREATMENT, AND DISPOSAL

The owner intends to design and install a new onsite system with pre-treatment and in-ground disposal via subsurface drip dispersal, or irrigation reuse. The installed system will be in accordance with all necessary Napa County Planning, Building, and Environmental Services (PBES) criteria and permits. The in-ground

disposal option will be designed for combined PW and SS flows, but each waste stream will have a dedicated package treatment system. Adequate disposal area is also available for PW disposal system to be designed

The proposed process wastewater systems would consist of the components listed below. Refer to Enclosure A for the PW management system schematic and Overall Site Plan.

Gravity Collection

The gravity collection system will be designed to provide low maintenance and no infiltration or exfiltration. Piping to be compatible with PW and satisfy Uniform Plumbing Code and local requirements. Screening will be provided by screened baskets and strainers installed on the trench drains and floor drains within the winery. Screen opening sizes should be approximately 1/4 inch for exterior drains and 1/8 inch for interior drains. Backwash from the water treatment system will not be disposed of through the SS system.

Settling Tanks with Effluent Filter

Solids settling and digestion in the settling tanks helps to reduce BOD and TSS concentrations entering the pre-treatment system and subsequently the disposal field, resulting in higher treatment unit performance, and reduced potential for clogging of the disposal field. An effluent filter will also be provided to remove additional suspended solids which do not settle out in the settling tank. The required settling tank size for the PW flows was evaluated based on Napa County PBES criteria, which requires 3 days min of settling capacity.

Volume = 3 HRT x Flow rate

Volume = 3 (2,400 gpd)

Volume = 7,200 gallons

A new concrete or fiberglass settling tank with a minimum volume of 7,200 gallons will be provided to remove solids and reduce BOD loads to the system.

Pump Tank/Sump

A duplex pump station will transfer screened PW collected in the conveyance system to the process wastewater in-ground disposal system or package treatment system prior to disposal.

pH Control System

A pH control system could be provided (if necessary) for neutralization of the winery PW, with dosing of neutralizing chemicals into the pump station. The combination of naturally occurring alkalinity in source water and alkaline cleaning compounds used within wineries usually provides sufficient buffering to maintain pond pH above 6.5. Neutralizing chemicals should only be used when absolutely necessary. It is recommended that the pH be monitored for a year, especially through one harvest season. If at the end of the one year monitoring period it has been demonstrated that pH control is necessary (or sooner if conditions warrant), a pH control system could be added within the sump.

Flow Measurement

An inline magnetic flow measurement device will measure flows from the PW pump station to the package treatment system.

Pre-Treatment and Disposal

A package treatment system will be utilized for treatment and disposal of PW, and disposed of as presented in the following options.

OPTION 1: PACKAGE TREATMENT SYSTEM WITH SUB-SURFACE DRIP DISPERSAL

Package Treatment System

Package treatment systems (i.e. textile filter, activated sludge systems, membrane bioreactor, etc.) have been widely utilized for PW and have been very successful in delivering consistent reliable effluent quality when properly designed and operated. Most manufacturers of these systems will provide performance guarantees for the treatment, given that the operational parameters are maintained within the initial design assumptions. If required, depending on the package treatment system selected, an equalization tank may be provided to equalize PW flow and quality prior to treatment through the package treatment system.

Dosing/ Pump Tank

Provide dose at evenly timed intervals and volumes to the subsurface disposal field following the package treatment system.

Headworks & Filter

A Geoflow Wasteflow Automatic Headworks will be provided which is a pre-assembled unit including the filter, valves and pressure gauge. It is installed between the dosing pump and the disposal field.

Flow Measurement

Additional flow measurement devices will be provided to measure the supply and flush return flows to the subsurface drip system.

Subsurface Drip Field

Treated effluent will be discharged into a subsurface drip field utilizing tubing manufactured by Geoflow. The subsurface drip system will be sized to accommodate the most conservative scenario with combined PW and SS flows. As an alternative, the subsurface drip field may be used to dispose of pre-treated SS flows only, if the PW flows are separately disposed of via irrigation reuse (Option 2). The minimum required size of the subsurface drip field is as follows:

$$\text{Subsurface Drip Field Area} = \frac{3{,}990 \text{ gpd}^{a}}{0.75 \frac{\text{gal}}{\text{SF}-\text{day}}} = 5{,}320 \text{ SF minimum}$$

$$\text{Subsurface Drip Tube Length} = \frac{5{,}320 \text{ SF}}{2 \; SF/LF} = 2{,}660 \text{ LF minimum}$$

[a] The total flow accounts for 1,590 gpd of SS and 2,400 gpd of PW as a worst case scenario

Using 2 SF/LF of drip tubing, a subsurface drip field system with 2,660 LF of drip tubing should be sufficient to accommodate the disposal of combined PW and SS flows. The drip tubing, manufactured by Geoflow, will be installed in 12 inch deep trenches with 2 feet of separation in between drip lines. Installation of the drip tubing near the soil surface will maximize the evaporation and percolation into the root zone of the soil. The area required for a subsurface drip disposal field is a minimum of 5,320 square feet, with a minimum 200% reserve area of 10,640 square feet. The 40,000 square foot area, proven suitable during the site evaluation, should provide adequate disposal capacity for the proposed PW and SS flows. See Enclosure B for more details on the preliminary subsurface drip disposal field sizing calculations.

OPTION 2: PACKAGE TREATMENT SYSTEM WITH SURFACE REUSE/DISPOSAL (PW ONLY)

Package Treatment System

As discussed in Option 1.

Effluent Storage Tank

An effluent storage tank shall be sized to accommodate approximately 15 days of storage during the winter months, to account for a prolonged rain event, when irrigation with treated PW effluent is prohibited.

Flow Measurement

An additional flow measurement device will be provided to measure the discharge flows to the irrigation system.

Filter

A filter will be provided to screen secondary effluent prior to irrigation.

Irrigation Disposal Area

The proposed vineyard area should provide adequate capacity for reuse and disposal (through percolation) of PW effluent from the winery. Reuse/disposal of effluent will be via drip irrigation of approximately 4 acres of vineyard. The irrigation demand from the vineyards far exceeds the estimated annual process wastewater volume that is generated. To meet the additional irrigation demand, the treated PW can be supplemented with well water. The irrigation demand is the lowest during the wet weather season (November through April) and application rates during this period should be less than 1 inch per month. An air gap or separate plumbing

will be installed for the existing irrigation system plumbing to prevent cross-contamination with treated effluent applied to the irrigation distribution network. See Enclosure D for the PW irrigation balance.

SOLID WASTES

Solid wastes from the winery primarily include pomace, seeds, and stems. The estimated quantities of these wastes (at peak capacity) are as follows:

$$Peak\ annual\ production = \ 40{,}000\ gal\ wine\ \times \frac{1\ ton}{165\ gal} = 242\ tons$$

$$Ultimate\ Annual\ Total = \ 35\% \times \ 242\ tons = 85\ tons$$

Based on a unit weight of 38 pounds per cubic foot, the annual volume of solids wastes would be:

$$85\ tons\ \times \frac{2{,}000\ lb}{1\ ton} = 170{,}000\ lb$$

$$170{,}000\ \text{lbs}\ \times \frac{1\ ft^3}{38\ lb} \times \frac{1\ yd^3}{27\ ft^3} = 166\ yd^3$$

These organic solids will be hauled to an off-site composting location, or can be composted and land applied to the existing vineyards. The depth of solid waste land application from peak annual production is approximately 0.1 feet per acre, or 0.006 feet over the available 17.58 acres of vineyard.

SANITARY SEWAGE MANAGEMENT SYSTEM

Baldacci Family Vineyards intends to install a new sanitary sewage (SS) wastewater management system in accordance with all necessary Napa County Planning, Building, and Environmental Services (PBES) criteria and permits. SS flows will be pre-treated and disposed of in a subsurface drip dispersal field. PW flows might also be disposed of in the same dispersal field, which will be sized to accommodate both PW and SS peak flows (see page 5).

The proposed SS management system will include a SS collection system, septic tank with effluent filter, a pump station, flowmeter, pre-treatment, and subsurface drip dispersal. The proposed SS management system has been sized for a peak daily wastewater flow of approximately 1,710 gpd, with the disposal area sized for the addition of 2,400 gpd of PW production.

SANITARY SEWAGE CHARACTERISTICS

SS will consist primarily of wastewater generated from winery restrooms, laboratories, and tasting room facilities. Two residences on the property also contribute wastewater to the SS system. Typical SS characteristics are summarized below:

TABLE 2.TYPICAL SANITARY SEWER CHARACTERISTICS

Characteristic	Units	Raw Wastewater Range[1]
BOD_s	mg/L	110 - 220
Grease	mg/L	50-100
Total Suspended Solids (TSS)	mg/L	100 - 220
Volatile Suspended Solids	mg/L	80 - 165
Total Dissolved Solids (TDS)	mg/L	250 - 500
Nitrogen	mg/L	20 - 40
Nitrate	mg/L	0
Phosphorous	mg/L	4 - 8
Alkalinity ($CaCO_3$)	mg/L	50 - 100
Chloride	mg/L	30 - 50
Sulfate	mg/L	20 - 30

[1]Typical composition of untreated domestic wastewater, Metcalf & Eddy, “Wastewater Engineering, Third Edition”, 1991

WINERY SANITARY SEWAGE DESIGN FLOWS

The proposed SS management system at Baldacci Family Vineyards will treat and dispose of wastewater generated from the winery restrooms, laboratories, and tasting room facilities. In addition to regular tasting visitors, Baldacci Family Vineyards will host catered private marketing events and industry & community events (requiring a special event permit) as follows:

Private Marketing Events

Wine Club Events	6 events/yr	@	50	visitors/event
Release Events	4 events/yr	@	100	visitors/event
Food & Wine Events	24 events/yr	@	30	visitors/event
Industry & Community Special Events [a]	9 events/yr	@	150	visitors/event

[a] Industry & community special events will be permitted under a special events permit and are not requested as part of this Use Permit

The SS management system will be designed to handle wastewater generated from 50 person events, which will occur 6 times per year. Peak SS generation is estimated using a 50 visitor marketing event, a maximum of 100 tasting visitors, and a maximum of 10 employees. Baldacci Family Vineyards is proposing to provide portable toilets for events with more than 50 people. For tasting visitors, the peak flow is estimated using 3 gpcd for wine tasting with hors d'oeuvres. For marketing event visitors, the peak flow is estimated using 6 gpcd for catered food pairings, with all food preparation and cleanup (dishwashing) done off-site. The estimated peak day harvest flows are provided below.

Peak Day – Harvest and Maximum Marketing Event

Employee (full-time)	10	x	15	gpcd	=	150	gpd
Tasting Visitors	100	x	3	gpcd	=	300	gpd
Marketing Visitors (50 person event)	50	x	6	gpcd	=	300	gpd
Total					=	**750**	**gpd**

The SS management system will be designed to handle a peak daily SS flow of 750 gpd from winery operations in addition to the residential sanitary flows outlined below. Backwash from the water treatment system will not be disposed of through the SS system.

RESIDENTIAL SANITARY SEWAGE FLOWS

Two residences currently exist on the property: a 3 bedroom farmworker residence and a 5 bedroom main residence. The septic systems currently serving each of the residences will be abandoned and replaced by the new system serving the winery. Residential SS flow estimates are as follows:

Residential SS Flow Estimate

Farmworker Residence	3	x	120	gpd/BR	=	360	gpd
5 Bedroom Residence	5	x	120	gpd/BR	=	600	gpd
Total					=	**960**	**gpd**

The SS management system will be designed to handle a peak daily SS flow of 750 gpd from winery operations, and 960 gpd from residential sources, for a total SS flow of 1,710 gpd.

SANITARY SEWAGE CONVEYANCE, TREATMENT AND DISPOSAL

The SS treatment and disposal system will have the components described below. Refer to Enclosure A for the SS management system schematic and Overall Site Plan.

Gravity Collection

The gravity collection system will be designed to provide low maintenance and no infiltration or exfiltration. Piping shall be compatible with sanitary sewer and satisfy Uniform Plumbing Code and local requirements.

Septic Tanks with Effluent Filter

Solids settling and digestion in the septic tanks helps to reduce BOD and TSS concentrations entering the pretreatment and disposal system, reducing the potential for clogging of the disposal field. An effluent filter will also be provided to remove additional suspended solids which do not settle out in the septic tank. The required septic tank size for the SS flows was evaluated based on the Uniform Plumbing Code, as follows:

Uniform Plumbing Code Method:

$$Volume = 1{,}125 + 0.75 \times Flow\ Rate$$

$$Volume = 1{,}125 + 0.75 \times 1{,}710\ gpd$$

$$Volume = 2{,}408\ gallons$$

A minimum 3,000 gallon septic tank will be provided for solids removal prior to pre-treatment and in-ground disposal of SS flows. Additional septic tank capacity will be provided if required by the selected pre-treatment manufacturer.

Package Treatment System

Package treatment systems (i.e. textile filter, activated sludge systems, membrane bioreactor, etc.) have been widely utilized for SS prior to subsurface drip dispersal, and have been very successful in delivering consistent reliable effluent quality when properly designed and operated. Most manufacturers of these systems will provide performance guarantees for the treatment, given that the operational parameters are maintained within the initial design assumptions. If required, depending on the package treatment system selected, an

equalization tank may be provided to equalize SS flow and quality prior to treatment through the package treatment system.

Dosing/ Pump Tank

Provide dose at evenly timed intervals and volumes to the subsurface disposal field following the package treatment system. The dosing tank will be sized for PW and SS flows

Headworks & Filter

A Geoflow Wasteflow Automatic Headworks will be provided which is a pre-assembled unit including the filter, valves and pressure gauge. It is installed between the dosing pump and the disposal field.

Flow Measurement

Additional flow measurement devices will be provided to measure the supply and flush return flows to the subsurface drip system.

Subsurface Drip Field

Treated effluent will be discharged into a subsurface drip field utilizing tubing manufactured by Geoflow. The subsurface drip system will be sized to accommodate the most conservative scenario with combined PW and SS flows. As an alternative, the subsurface drip field may be used to dispose of pre- treated SS flows only, if the PW flows are separately disposed of via irrigation reuse.

$$\text{Subsurface Drip Field Size} = \frac{4{,}110 \text{ gpd}^{a}}{0.75 \frac{\text{gal}}{\text{SF}-\text{day}}} = 5{,}480 \text{ SF minimum}$$

$$\text{Subsurface Drip Tube Length} = \frac{5{,}480 \text{ SF}}{2\ SF/LF} = 2{,}740 \text{ LF minimum}$$

[a] The total flow accounts for 1,710 gpd of SS and 2,400 gpd of PW as a worst case scenario

Using 2 SF/LF of drip tubing, a subsurface drip field system with 2,740 LF of drip tubing should be sufficient to accommodate the disposal of combined PW and SS flows. The drip tubing, manufactured by Geoflow, will be installed in 12 inch deep trenches with 2 feet of separation in between drip lines. Installation of the drip tubing near the soil surface will maximize the evaporation and percolation into the root zone of the soil. The area required for a subsurface drip disposal field will be a minimum of 5,480 square feet, with a minimum 200% reserve area of 10,960 square feet. The 40,000 square foot area, proven suitable during the site evaluation, should provide adequate disposal capacity for all PW and flows. See Enclosure B for more details on the preliminary subsurface drip disposal field sizing calculations.

OTHER CONSIDERATIONS

ODOR CONTROL

There should be no noxious odors from a properly designed and operated treatment system. See Alternative Courses of Action for operation alternatives.

GROUNDWATER CONTAMINATION

The nearest water well to the PW and SS treatment and disposal systems will be a minimum of 100 feet. No disposal of wastewater effluent will occur within 100 feet of any existing wells. Irrigation with or disposal of treated PW effluent is considered a beneficial use and is an effective means to protect groundwater quality. Well water may supplement treated PW for irrigation when capacity permits. Treated SS will not be used for irrigation.

WATER TREATMENT SYSTEM BACKWASH

Currently, backwash from existing water treatment systems discharges to the ground, and not to any wastewater treatment system. Upgrades to the existing systems, or the installation of new systems, will maintain disconnection from any wastewater collection, treatment, or disposal system.

PROTECTION

Exposed wastewater treatment facilities should be posted with appropriate warning signs. The treatment areas will be protected to restrict access and potential damage to the system.

ALTERNATIVE COURSES OF ACTION

Although no operational difficulties are foreseen, the following additional courses of action would be available if necessary for the PW system:

- Additional stages of treatment to increase effluent quality
- Increased use of irrigation/disposal area to increase discharge capacity
- The PW effluent storage tank would be designed for retention of treated PW for approximately 15 days during the rainy season, allowing for minimal discharges to irrigation fields. Should there be a winter with more rainfall than the design condition, several operational procedures are available to compensate:
    - Additional water conservation at winery
    - Light irrigation during periods between storms – not exceeding the assimilative capacity of the soil
    - Increased irrigation during the months of planned irrigation as long as there is acceptable soil percolation capacity
    - Temporary pumping and truck transfer of treated and diluted wastewater to an approved treatment plant.

For the SS management system, should there be any unforeseen operational difficulties; the following additional courses of action would be available if necessary:

- Temporary pumping and truck transfer of treated and diluted wastewater to an approved treatment plant would be used as additional courses of action
- Additional stages of treatment to increase effluent quality
- Expansion of the subsurface drip dispersal field.

ENCLOSURE A

VICINITY MAP

OVERALL SITE PLAN

WASTEWATER SITE PLAN

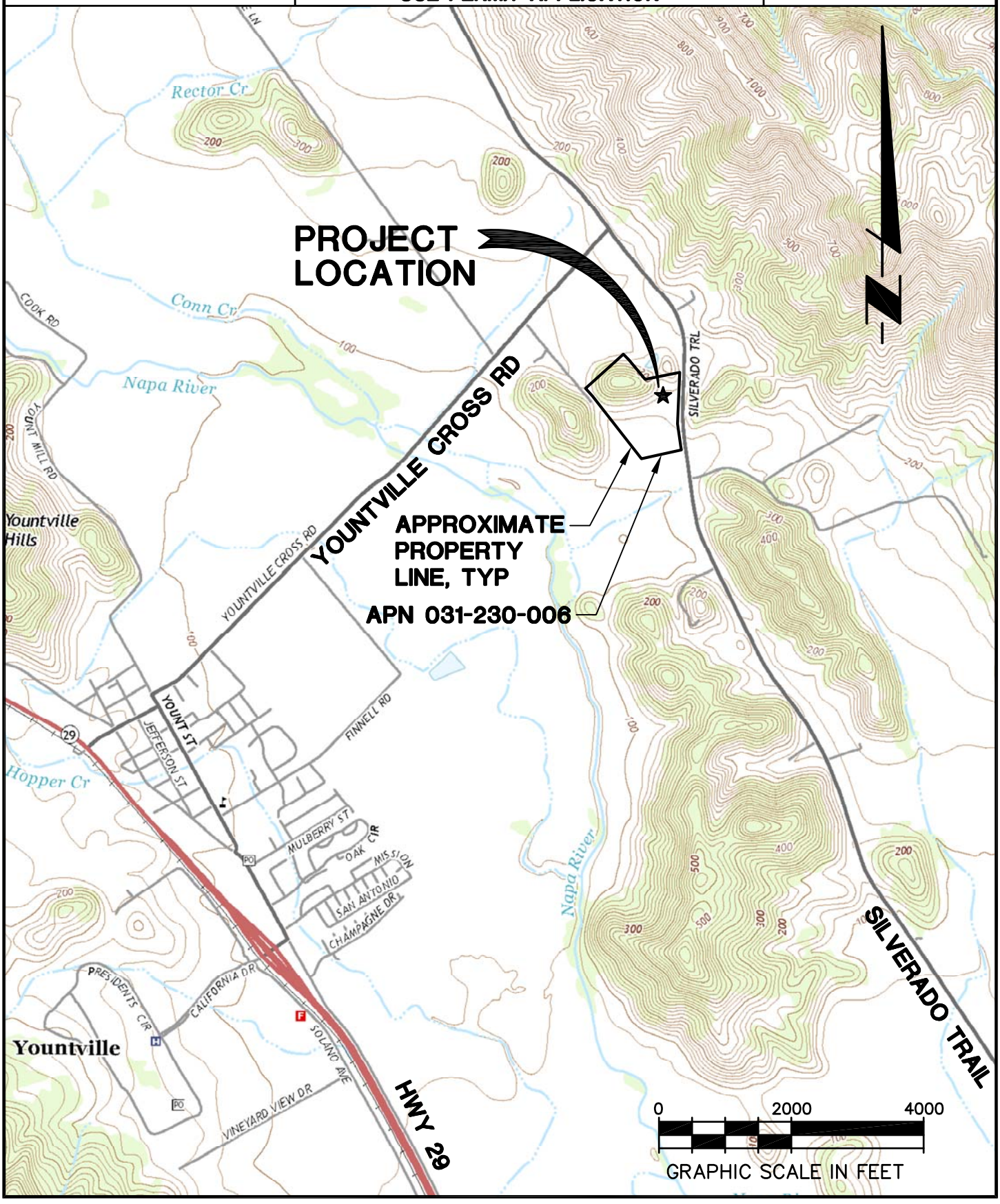
WASTEWATER SYSTEM SCHEMATIC

SUMMIT

BALDACCI FAMILY VINEYARDS
6236 SILVERADO TRAIL
NAPA, CA
APN 031-230-006

USE PERMIT APPLICATION

PROJECT NO. 2015167
DATE 2015-12-02
SHT NO 1 OF 1
BY TF CHK MS



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ABBREVIATIONS:

AC	ASPHALT CONCRETE
ADMIN	ADMINISTRATIVE
APPROX	APPROXIMATE
BLDG	BUILDING
℄	CENTERLINE
DI	DRAIN INLET
(E)	EXISTING
FF	FINISH FLOOR
FH	FIRE HYDRANT
GB	GRADE BREAK
NCRSS	NAPA COUNTY ROAD & STREET STANDARDS
SD	STORM DRAIN
SS	SANITARY SEWER
TYP	TYPICAL

OWNER:
BALDACCI FAMILY VINEYARDS
6236 SLIVERADO TRAIL
NAPA, CALIFORNIA

APPLICANT:
THOMAS BALDACCI
BALDACCI FAMILY VINEYARDS
6236 SLIVERADO TRAIL
NAPA, CALIFORNIA

APN 031-220-020
APN 031-230-018
APN 031-220-016
APN 031-220-015
APN 031-230-006
APN 031-230-007

APPROXIMATE PROPERTY LINE, TYP
157.14'±
770.51'±
1201.48'±
122.67'±
379.55'±
466'±
815'±
207.10'±
410.42'±
600'±
164'±
778.72'±
341.56'±
57.08'±
75'±

100' WELL SETBACK, TYP
(E) WELL #1 TO REMAIN
(E) WELL #2 TO REMAIN
(E) WELL #3 TO REMAIN
(E) WELL #4 TO REMAIN
(E) WELL #5 TO BE ABANDONED
(E) WELL #6 TO REMAIN
(E) LEACHFIELD TO BE ABANDONED
(E) VINEYARD
(E) 5 BR RESIDENCE
(E) RETAINING WALL
(E) FIRE ACCESS TO (E) RESIDENCE
(E) WINE CAVES
(E) DRIVEWAY TO RESIDENCE
(E) WATER TANKS TO BE RELOCATED
(E) GARAGE TO REMAIN
(E) PERMITTED FARMWORKER HOUSING TO REMAIN
(E) ENTRANCE TO BE USED FOR RIGHT TURN ONLY

600' WINERY SETBACK FROM CENTERLINE OF SILVERADO TRAIL
PRODUCTION BLDG
CAVE PORTAL
WINE CAVES
ACCESSIBLE PATH OF TRAVEL
PRODUCTION PARKING (1 ACCESSIBLE SPACE, 3 TOTAL)
EMERGENCY VEHICLE TURNAROUND PER NCRSS
APPROX LOCATION OF FH
18' WIDE ACCESS ROAD W/2' SHOULDER
COURTYARD
APPROX LOCATION OF FH
VISITOR PARKING (11 SPACES)
RETAINING WALL
EVENT PARKING
FIRE ACCESS ROUTE
18' WIDE ACCESS ROAD W/(2) 1 ' SHOULDERS
RELOCATED GATE PER NCRSS
VEHICLE TURNAROUND
NEW ACCESS ROAD CONNECTION TO SILVERADO TRAIL
RELOCATED OLIVE GROVE
RELOCATED WATER TANKS
HOSPITALITY BLDG
534.14'±
(E) HOSPITALITY BLDG TO BE CONVERTED TO ADMINISTRATIVE BLDG
ACCESSIBLE PATH OF TRAVEL
ACCESSIBLE PARKING (2 SPACES)
TRASH ENCLOSURE
SILVERADO TRAIL

0 80 160
GRAPHIC SCALE IN FEET

SUMMIT
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BALDACCI FAMILY VINEYARDS
6236 & 6171 SILVERADO TRAIL
NAPA, CALIFORNIA
APN 031-230-006 & APN 031-220-015

USE PERMIT APPLICATION

OVERALL SITE PLAN

	2015-12-22 PERMIT SUBMITTAL
	2016-03-24 PERMIT RESUBMITTAL
	2016-06-13 PERMIT RESUBMITTAL

DATE:	2015-12-22
JOB NO:	2015167
SCALE:	AS SHOWN
DRAWN:	TF
CHECKED:	MS
SHEET	UP1

0 60 120
GRAPHIC SCALE IN FEET

100' SETBACK, TYP

(E) WELL #1

APN 031-220-020

APPROXIMATE PROPERTY LINE, TYP

APN 031-220-016

(E) WATER IRRIGATION TANKS (3–10,000 GAL)

(E) WELL #2

LAVA ROCK FOUND AT 12" (POTENTIAL DRAINTILES)

PRIMARY AND RESERVE DISPOSAL AREAS (40,000 SF AVAILABLE)

APN 031-220-015

(E) VINEYARD

APN 031-230-006

SP8 48"
SP4 48"
SP7 48"
SP3 48"
SP6 48"
SP2 48"
SP10 40"
SP12 42"
SP5 48"
SP1 48"
SP9 42"
SP11 36"

50' SETBACK

(E) VINEYARD

SETBACK TO DISPOSAL AREA

25'

(E) WELL #3

APPROXIMATE LOCATION (E) LEACHFIELD FOR 5 BR RESIDENCE TO BE ABANDONED

(E) SS TO BE ABANDONED

(E) VINEYARD

CAVE DRAIN OUTLET

(E) WELL #6

APPROXIMATE LOCATION (E) LEACHFIELD FOR FARMWORKER RESIDENCE AND WINERY TO BE REPLACED BY NEW SYSTEM

(E) VINEYARD

(E) SEPTIC TANK TO BE ABANDONED

(E) 5 BR RESIDENCE

10' SETBACK

PRODUCTION BUILDING

WINE CAVE TUNNEL FF 130.25 FT

APN 031-230-007

CAVE PORTAL

(E) WINE CAVE

(E) CAVE PORTALS

RELOCATED WATER TANKS (2-2,500 GAL)

HOSPITALITY BUILDING

(E) HOSPITALITY BUILDING TO BE CONVERTED TO ADMIN BUILDING

(E) WATER STORAGE TANKS (2–2,500 GAL)

TRASH ENCLOSURE

(E) GARAGE

(E) PERMITTED FARMWORKER RESIDENCE

ACCESS ROAD

PARKING

(E) WELL #5 TO BE ABANDONED

(E) WELL #4

SILVERADO TRAIL

CONNECT TRASH ENCLOSURE DRAIN TO SS

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BALDACCI FAMILY VINEYARDS
6236 & 6171 SILVERADO TRAIL
NAPA, CALIFORNIA
APN 031-230-006 & APN 031-220-015

USE PERMIT APPLICATION

WASTEWATER SITE PLAN

2015-12-22	PERMIT SUBMITTAL
2016-03-24	PERMIT RESUBMITTAL
2016-06-13	PERMIT RESUBMITTAL

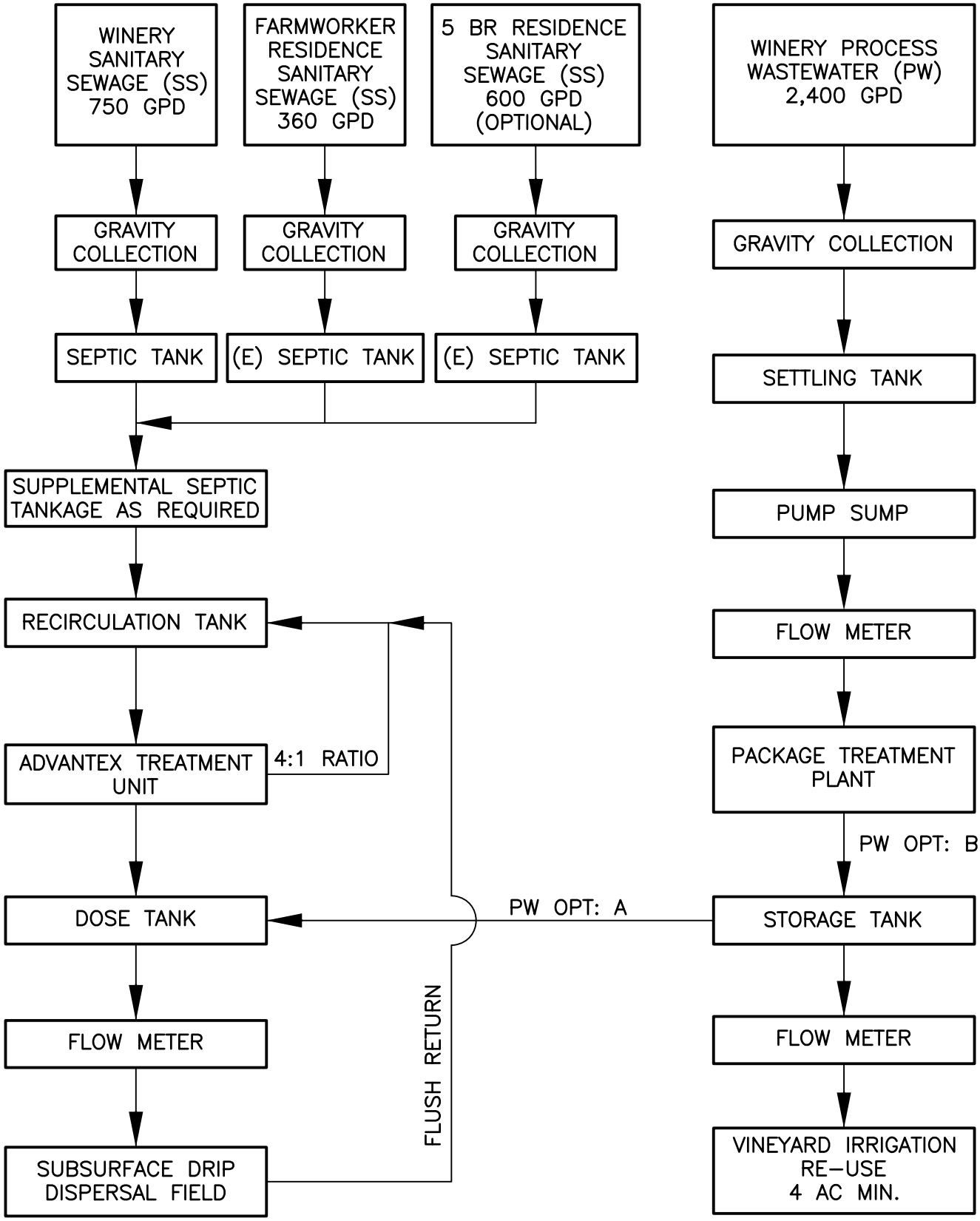
DATE: 2015-12-22
JOB NO: 2015167
SCALE: AS SHOWN
DRAWN: TF
CHECKED: JR

SHEET **UP3**

SUMMIT

BALDACCI FAMILY VINEYARDS
6236 SILVERADO TRAIL
NAPA, CA
APN 031-230-006
PW & SS SYSTEM SCHEMATIC

PROJECT NO. 2015167
DATE 06-13-16
SHT NO 1 OF 1
BY JR CHK GG



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ENCLOSURE B

SANITARY SEWAGE FLOW ESTIMATES

PROCESS WASTEWATER FLOW ESTIMATES & IRRIGATION HOLDING TANK SIZING

SUBSURFACE DRIP DISPOSAL FIELD SIZING

IRRIGATION BALANCE

CLIMATE DATA

SUMMIT ENGINEERING, INC.	BALDACCI VINEYARDS Wastewater Feasibility Study Sanitary Sewage Flows Estimate	PROJECT NO. 2015167 BY: JR CHK: GG

WINERY SANITARY SEWAGE

Peak Tasting Day & Event

Employee (full-time)	10	x	15	gpcd	=	150 gal/day
Tasting Visitors	100	x	3	gpcd	=	300 gal/day
Event Visitors	50	x	6	gpcd	=	300 gal/day
Total Winery Design Flow					=	**750 gal/day**

RESIDENTIAL SANITARY SEWAGE

Farmworker Residence	3	x	120	gpd/BR	=	360 gal/day
5 Bedroom Residence	5	x	120	gpd/BR	=	600 gal/day
Total Residential Design Flow						**960 gal/day**

TOTAL SANITARY SEWAGE DESIGN FLOW = **1,710 gal/day**

SUMMIT ENGINEERING, INC.	BALDACCI VINEYARDS Wastewater Feasibility Study Process Wastewater Flow EstimateS	PROJECT NO. 2015167 BY: CL CHK: JR

PROCESS WASTEWATER

Annual Volume

Annual Production (projected)						=	16,667	cases wine/year
Generation Rate (assumed)[a]						=	2.4	gal wine/case of wine
Annual Production	16,667	cases wine/year	x	2.4	gal wine/case of wine	=	40,000	gal wine/year
Generation Rate (assumed)[b]						=	165	gal wine/ton grapes
Tons Crushed	40,000	gal wine/year	÷	165	gal wine/ton grapes	=	242	tons grapes/year
Process Wastewater (PW) Generation Rate[c]	(assumed)					=	6.00	gal PW/gal wine
Annual PW Flow	40,000	gal wine/year	x	6.00	gal PW/gal wine	=	***240,000***	***gal PW/year***

Average Day Flow

	240,000	gal PW/year	÷	365	days	=	***658***	***gal PW/day***

Napa County Peak Day Flow

Length of Harvest						=	45	days
Peak Flow	40,000 45	gal wine/year days	x	1.5		=	***1,333***	***gal PW/day***
						=	***1,400***	***gal PW/day***

Average, Day Peak Harvest Month Flow

Assume:	1	16.4%	of the PW flows are accounted for during September
	2	30	days in September

Peak Flow	240,000 30	gal PW/year days	x	16%		=	*1,312*	*gal PW/day*
						=	***1,400***	***gal PW/day***

Average Day of the Peak Week Crush Flow

Assume:	1	73	tons produced during peak week (assume 30% crushed in one week)
	2	225	gal PW/ton during the peak harvest week
	3	7	days processing during peak week

Flow per peak week	73	tons	x	225	gal PW/ton	=	16,364	gal PW/week
Average Flow of Peak Week	16,364	gal PW/week	÷	7	days	=	***2,338***	***gal PW/day***
						=	***2,400***	***gal PW/day***

a. 2.4 gallons of wine per case of wine
b. 165 Gal wine per ton of grapes is used as a wine industry standard
c. 6.0 gal of PW per gallon wine produced over the course of 1 year is based on the average of data from approximately 16 wineries

SUMMIT ENGINEERING, INC.	BALDACCI VINEYARDS Wastewater Feasibility Study Subsurface Drip Dispersal Field Sizing	PROJECT NO. 2015148 BY: JR CHK: GG

Subsurface Drip Dispersal System

		Sanitary Sewage	Process Wastewater
Sizing based on Geoflow guidelines			
Design Flow	=	1,710 gal/day	2,400 gal/day
Depth to Groundwater or other limit	=	48 inches	48 inches
Application	=	0.75 gal/sf/day	0.75 gal/sf/day
Square Footage required	=	2,280 sf	3,200 sf
Primary Area required	=	2,280 x	3,200 x
200% Reserve Area Required	=	4,560 square feet	6,400 square feet
Total Area	=	6,840 square feet	9,600 square feet
	=	0.16 acres	0.22 acres
Total Combined Disposal Area	**=**	**5,480 square feet - Primary**	
	=	**10,960 square feet - Reserve**	

SUMMIT ENGINEERING, INC.	BALDACCI VINEYARDS Wastewater Feasibility Study Process Wastewater Flow Estimates	PROJECT NO. 2015167 BY: CL CHK: JR

DESIGN CRITERIA

FULL PRODUCTION

Production Level	16,667	cases/year	
Annual Production	40,000	gal wine/year	
Crush Period	45	day	* per PBES criteria
Annual PW Flow	240,000	gal PW/year	
Average PW Flow	658	gal PW/day	
PW Generation Rate	6.0	gal PW/gal wine	
Peak Harvest Day	1,400	gal PW/day	* per PBES criteria
PW Flows accounted during September	16.4	%	
Average Day Peak Harvest Month	1,400	gal PW/day	
Average Day Peak Week Crush Flow	2,400	gal PW/day	

IRRIGATION STORAGE TANK DESIGN

Average winter month flow	414	gal PW/day
15 day storage volume	6,203	gal PW/day
Specified tank size	7,000	gal PW/day

DESIGN PROCESS WASTEWATER FLOWS

Month	PW Monthly Percentage of Annual Flow[a] (%)	Total PW Flow[a] (Mgal)
August	10.5%	0.025
September	16.4%	0.039
October	12.9%	0.031
November	7.4%	0.018
December	6.4%	0.015
January	6.6%	0.016
February	7.2%	0.017
March	7.6%	0.018
April	6.8%	0.016
May	6.4%	0.015
June	5.6%	0.013
July	6.2%	0.015
Total	**100%**	**0.240**

[a] Assumption of monthly percentage of annual flow based on average of PW flow data for similar small wineries

SUMMIT ENGINEERING, INC.	BALDACCI VINEYARDS Wastewater Feasibility Study PW Irrigation Balance	PROJECT NO. 2015167 BY: JR CHK: GG

Applied Irrigation Area Vineyard 4.00 acres

Total Area Available for Irrigation Vineyard 18.0 acres

Month	Reference ET[a]	Vineyard Crop Coefficient[c]	Vineyard ET[d]	100 year Precipitation[e]	Irrigation Demand[f]		Operating Days per Month[g]	Percolation Capacity[h]		Assimilative Capacity[i]		Effluent Applied[j]		Excess Capacity
	(in)		(in)	(in)	(in)	(Mgal)	(d)	(in)	(Mgal)	(in)	(Mgal)	(in)	(Mgal)	(Mgal)
August	6.5	0.5	2.9	0.2	2.8	0.300	31	1.49	0.162	4.2	0.461	0.23	0.025	0.44
September	5.1	0.3	1.3	0.9	0.4	0.048	30	1.44	0.157	1.9	0.204	0.36	0.039	0.16
October	3.4	0.1	0.2	4.0	0.0	0.000	16	0.77	0.083	0.8	0.083	0.29	0.031	0.05
November	1.8	0.0	0.0	10.4	0.0	0.000	14	0.67	0.073	0.7	0.073	0.16	0.018	0.06
December	0.9	0.0	0.0	11.3	0.0	0.000	5	0.24	0.026	0.2	0.026	0.14	0.015	0.01
January	1.2	0.0	0.0	16.1	0.0	0.000	6	0.29	0.031	0.3	0.031	0.15	0.016	0.02
February	1.7	0.0	0.0	15.3	0.0	0.000	5	0.24	0.026	0.2	0.026	0.16	0.017	0.01
March	3.4	0.0	0.0	11.5	0.0	0.000	12	0.58	0.063	0.6	0.063	0.17	0.018	0.04
April	4.8	0.2	0.8	3.8	0.0	0.000	13	0.62	0.068	0.6	0.068	0.15	0.016	0.05
May	6.2	0.6	3.6	1.5	2.1	0.231	16	0.77	0.083	2.9	0.315	0.14	0.015	0.30
June	6.9	0.7	4.9	0.4	4.5	0.493	17	0.82	0.089	5.3	0.581	0.12	0.013	0.57
July	7.4	0.6	4.8	0.1	4.7	0.508	30	1.44	0.157	6.1	0.665	0.14	0.015	0.65
Total	**49.4**		**18.5**	**75.4**	**14.5**	**1.6**	**195.0**	**9.4**	**1.0**	**23.9**	**2.6**	**2.2**	**0.24**	**2.36**

(a) Average monthly reference evapotranspiration rates, see Climate Data Worksheet.

(b) Kc coefficients for pasture from Table 1, "Landscape Irrigation System Evaluation and Management"- University of California Cooperative Extension, April 2009

(c) Kc coefficients for vineyards from Table 5-12, Irrigation with Reclaimed Municipal Wastewater - A Guidance Manual, 84-1 wr, SWRCB.

(d) ET=ETo x Kc. A weighted value is determined on the basis of the available irrigated acreage of vineyard and pasture.

(e) Precipitation, 10-year rainfall event, see Climate Data Worksheet.

(f) Irrigation Demand = ET-Precipitation, inches. A weighted value is determined on the basis of the available irrigated acreage of vineyard and pasture.

(g) Number of operating days per month based on estimated irrigation days available based on 24-hr post storm criteria for a 100-year return period. Summit Engineering, NBRID Capacity Study, April 1996.

(h) Design percolation rate is a maximum of.05 inches per day for the number of operating day per month. Per USDA soil survey, predominant soil type is Bale clay loam.
Sizing perc rate based on clay soils. Pretreated loading rates for non-shrink clay soils adjusted by a 0.04 safety factor to account for typical slow rate land application design methodology.

(i) Assimilative capacity is the sum of irrigation demand and percolation applied.

(j) Effluent applied depths exceeding 1 inch/month could result in ponding; if ponding occurs, additional disposal area may be required for expansion

Hourly Percolation Rate	0.05	in/hr
15	24	hr/day
Daily Percolation Rate	1.2	in/day
Land Application Safety Factor	0.04	
Adjusted Percolation Rate	0.05	in/day

SUMMIT ENGINEERING, INC. Consulting Civil Engineers	BALDACCI VINEYARDS WASTEWATER FEASIBILITY STUDY Climate Data	PROJECT NO. 2015167 BY: JR CHK: GG

Month	Days	Average Temp[a] (F)	Reference Evapotranspiration[b] (in)	Pan Evaporation[c] (in)	Lake Evaporation[d] (in)	Average Precipitation[e] (in)	10-Year Precipitation[f] (in)	100-Year Precipitation[f] (in)
August	31	71.0	6.5	12.06	9.3	0.08	0.1	0.2
September	30	68.6	5.1	8.67	6.7	0.41	0.6	0.9
October	31	62.5	3.4	5.72	4.4	1.84	2.8	4.0
November	30	53.4	1.8	2.48	1.9	4.83	7.3	10.4
December	31	47.6	0.9	1.66	1.3	5.22	7.9	11.3
January	31	47.9	1.2	1.53	1.2	7.46	11.3	16.1
February	28	51.4	1.7	2.15	1.7	7.10	10.7	15.3
March	31	54.1	3.4	3.79	2.9	5.31	8.0	11.5
April	30	58.6	4.8	5.82	4.5	1.74	2.6	3.8
May	31	63.6	6.2	8.90	6.9	0.68	1.0	1.5
June	30	68.8	6.9	11.00	8.5	0.17	0.3	0.4
July	31	71.6	7.4	13.22	10.2	0.04	0.1	0.1
Total	**365**		**49.4**	**77.0**	**59.3**	**34.9**	**52.6**	**75.4**

[a] Average monthly temperature observed between 1931 and 2001 for Saint Helena, Napa, CA from NOAA

[b] Average monthly reference evaporation rates for Zone 8, Inland San Fransisco Bay Area, typical rainfall year, CIMIS, DWR, 2001. See www.itrc.org.

[c] Average monthly pan evaporation rates observed at Lake Berryessa, between 1957 and 1970. See http://www.calclim.dri.edu/ccda/comparative/avgpan.html

[d] Pan evaporation rates adjusted by a factor of 0.77 to determine lake evaporation.

[e] Average monthly rainfall observed between 1931 and 2001 for Saint Helena, Napa, CA from NOAA

[f] Average monthly rainfall adjusted by the ratio of 10-yr and 100-yr wet year return storm identified by Pearsons Log III Distribution (St Helena)

Revised June 13, 2016

ENCLOSURE C

SITE EVALUATION DATA

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 #:

APN: 031-230-006

(County Use Only)
Reviewed by: Date:

PLEASE PRINT OR TYPE ALL INFORMATION

Property Owner Baldacci Family Vineyards	☐ New Construction ☒ Addition ☐ Remodel ☐ Relocation ☐ Other:
Property Owner Mailing Address 6236 Silverado Trail	☒ Residential - # of Bedrooms: 8 Design Flow : 960 gpd
City: Napa State: CA Zip: 94558	☒ Commercial – Type: Winery Sanitary Waste: 630 gpd Process Waste: 2,400 gpd
Site Address/Location 6236 Silverado Trail Napa, CA, 94558	☐ Other: Sanitary Waste: gpd Process Waste: gpd

Evaluation Conducted By:

Company Name Summit Engineering Inc	Evaluator's Name Claudia Llerandi	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist)
Mailing Address: 463 Aviation Blvd, Suite 200		Telephone Number 707-527-0775
City: Santa Rosa State: CA Zip: 95403		Date Evaluation Conducted 11/04/15

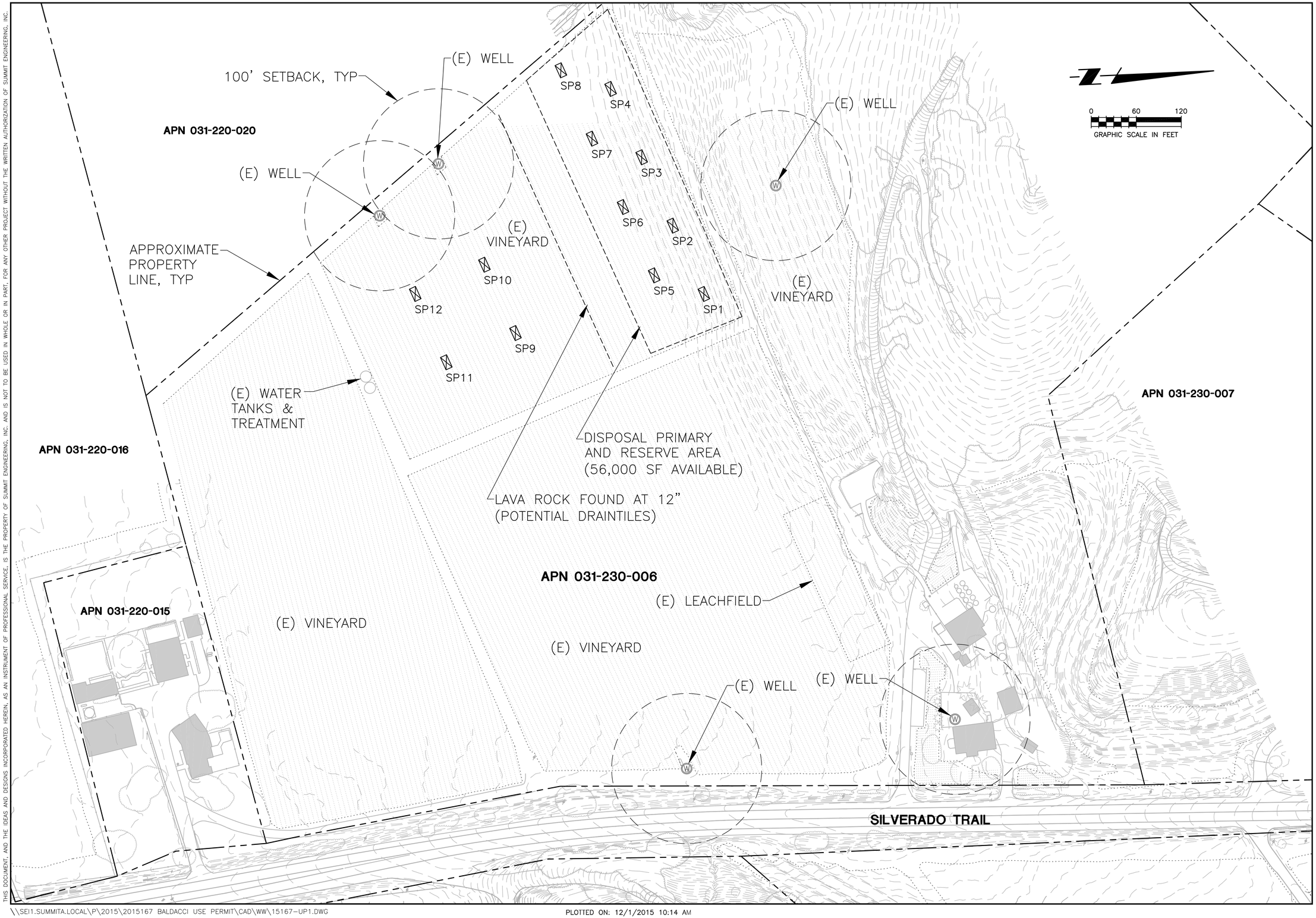
Primary Area	**Expansion Area**
Acceptable Soil Depth: 42 in. Test pit #'s: 1, 2, 3, 4	Acceptable Soil Depth: 48 in. Test pit #'s: 5, 6, 7, 8
Soil Application Rate (gal. /sq. ft. /day): 0.5 for PD or 0.75 for Drip	Soil Application Rate (gal. /sq. ft. /day): 0.5 for PD or 0.75 for Drip
System Type(s) Recommended: PD leachfield or Drip w/pretreatment	System Type(s) Recommended: PD leachfield or Drip w/pretreatment
Slope: 10-15%. Distance to nearest water source: +100 ft.	Slope: 10-15%. Distance to nearest water source: +100 ft.
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)
Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)	Groundwater Monitoring Performed? No ☒ Yes ☐ (attach results)

Site constraints/Recommendations:

A total of 12 pits were evaluated in the presence of Napa Country Environmental Health Specialist, Rebecca Setliff . Pit 1 through 8 had 42" to 48" of sandy loam and sandy clay loam with weak to moderate structure.
The area covered by pits 1 through 8 is suitable for a subsurface drip system with pretreatment, and should be sufficient to accomodate the primary and reserve area for the system option. For installing a subsurface drip system with pretreatment, a soil application rate of 0.75 gpd/sf will be used for design.
Pits 9, 10, 11 and 12 had 36" to 42" of sandy clay loam with some signs of potential mottling at 24". The area covered by pits 9, 10, 11 and 12 will not be used for wastewater disposal.

Test Pit #	Horizon Depth (inches)	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
1	48	5	SL	W/SB	L-S	L-VFRB	NS-NP	C, F/M	F/C, F/M	NONE
2	48	5	SL	W-M/SB	S	VFRB	SS-SP	C, F/M	F/C, F/M	NONE
3	46	5	SL	W-M/SB	S	VFRB	SS-SP	C, F/M	F/C, F/M	NONE
4	42	10	SL	M/SB	S	FRB	SS-SP	C, F/M	F/C, F/M	NONE
5	48	5	SL	W-M/SB	L-S	L-VFRB	NS-NP	C, F/M	F/C, F/M	NONE
6	48	20	SL	W-M/SB	L-S	VFRB-FRB	NS-NP	C, F/M	F/C, F/M	NONE
7	48	5	SCL-SL	W-M/SB	L-S	VFRB-FRB	NS-NP	C, F/M	F/C, F/M	NONE
8	48	20	SCL-SL	W-M/SB	L-S	VFRB-FRB	NS-NP	C, F/M	F/C, C/M	NONE
9	42	35	SCL	M/SB	S	VFRB	SS-SP	C, F/M	F/C, C/M	POTENTIAL MOTTLING
10	40	20	SCL	W-M/SB	S	VFRB-FRB	SS-SP	C, F/M	F/C, C/M	POTENTIAL MOTTLING
11	36	35	SCL	M/SB	S	FRB	SS-SP	C, F/M	F/C, C/M	POTENTIAL MOTTLING
12	42	5	SCL	M/SB	S	FRB	S-P	C, F/M	F/C, C/M	POTENTIAL MOTTLING

Boundary	Texture	Structure	Consistence			Pores	Roots	Mottling
			Side Wall	Ped	Wet			
A=Abrupt <1"	**S**=Sand	**W**=Weak	**L**=Loose	**L**=Loose	**NS**=NonSticky	**Quantity:**	**Quantity:**	**Quantity:**
C=Clear 1"-2.	**LS**=Loamy Sand	**M**=Moderate	**S**=Soft	**VFRB=**Very F	**SS**=Slightly	**F**=Few	**F**=Few	**F**=Few
G=Gradual 2.	**SL**=Sandy Loam	**S**=Strong	**SH**=Slightly	Friable	Sticky	**C**=Common	**C**=Common	**C**=Common
D=Diffuse >5	**SCL**=Sandy Clay Loam	**G**=Granular	**H**=Hard	**FRB**=Friable	**S**=Sticky	**M**=Many	**M**=Many	**M**=Many
	SC=Sandy Clay	**Pl**=Platy	**VH**=Very	**F**=Firm	**VS=**Very	**Size:**	**Size:**	**Size:**
	CL=Clay Loam	**Pr**=Prismatic	**ExH**=	**VF**=Very	Sticky	**VF**=Very	**F**=Fine	**F**=Fine
	L=Loam	**C**=Columnar	Extrm Hard	Firm	**NP=**Non	Fine	**M**=Medium	**M**=Medium
	C=Clay	**AB**=Ang. Blocky		**Ex=**	Plastic	**F**=Fine	**C**=Coarse	**C**=Coarse
	SiC=Silty Clay	**SB**=Subang.Blocky		Extrm. Firm	**SP**=Slightly	**M**=Medium	**VC**=Very	
	SiCL=Silty Clay Loam	**M**=Massive			Plastic	**C**=Coarse	Coarse	**Contrast:**
	SiL=Silt Loam	**SG**=Single Grain			**P**=Plastic	**VC**=Very	**ExC**=Extrm.	**Ft**=Faint
	Si=Silt	**C**=Cemented			**VP**=Very	Coarse	Coarse	**D**=Distinct
					Plastic			**P**=Prominent



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BALDACCI FAMILY VINEYARDS
6236 SILVERADO TRAIL
NAPA, CA
APN 031-230-006

BALDACCI VINEYARDS USE PERMIT

SOIL EVALUATION PLAN

DATE:	2015-11-16
JOB NO:	2015167
SCALE:	AS SHOWN
DRAWN:	TF
CHECKED:	CL

SHEET **UP1**

Contact:
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