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Wastewater Analysis



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Domestic & Production Wastewater Feasibility Report for the proposed Promise Winery

2004 Sage Canyon Road
St. Helena, CA 94574
APN: 032-520-009

Prepared By:

CMP Civil Engineering & Land Surveying
1607 Capell Valley Road
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Date: 12/6/2023
Rev 1: 4/29/2024
Rev 2: 10/22/2024

Project #00170



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Contact Information	
Property Owner:	Promise Wine, LLC
Owner Address:	2004 Sage Canyon Road St. Helena, CA 94574
Owner Phone:	(707) 260-9094

Site Map:

Please refer to the Use Permit Application Materials for the proposed Promise Winery and the Vineyard Dispersal Area Map attached to this report.

Existing Site Conditions:

The project site consists of a single 62.56-acre parcel located at 2004 Sage Canyon Road in Napa County. The property is currently developed with one four-bedroom main residence and a one-bedroom second dwelling unit, along with 3.56 net acres of vineyard which are currently under development. There is an existing on-site engineered wastewater treatment system sized for six bedrooms, or 720 gallons per day, which is designed to serve both residences.

Proposed Winery:

The proposed winery will be developed in two phases. The first phase will consist of converting an existing agricultural barn to a production winery and converting the existing second dwelling unit to a tasting room. On-site wine production during this first phase will be limited to fermentation in barrel and barrel aging of wine, up to 5,000 gallons per year. No processing of fruit will occur during this phase, and all processing activities will occur at an off-site custom crush facility.

The first phase operation will be staffed by two full-time employees and one part-time employee. Visitation during the first phase will be limited to a maximum of eight daily tours & tasters (56 per week) and two 25-person marketing events per year. The marketing events will be catered, with food prepared off-site.

The second phase of operation involves the construction of a winery cave for additional wine production and barrel aging. On-site winemaking activities will be expanded to include all aspects of winemaking, including on-site processing of fruit. Wine production will increase to 30,000 gallons per year in the second phase of operation.

The number of employees for the second phase of operation will be increased to two full-time and three part-time employees. Additionally, daily visitation will be increased to 15 daily tours & tasters (105 per week) and the number of marketing events will be expanded to six 25-person events and one 100-person event.

Proposed Wastewater Flows & Analysis – Phase 1:

Winemaking activities during the first phase of operation will be limited to activities which do not produce process waste, including barrel fermentation and aging. There will be no on-site processing of grapes during this phase of operation.

Domestic wastewater flows are calculated based on the number of employees and visitors. For the first phase of operation there will be eight daily visitors, two 25-person events, two full-time employees and one part-time employee. Expected wastewater flows are 3 gallons per day (GPD) per visitor, 5 GPD per

event attendee, 15 GPD per full-time employee and 8 GPD per part-time employee. The employees, daily visitors and 25-person marketing events will be served by the on-site restroom facilities. As such, the calculated peak domestic wastewater flow during the first phase of operation is 187 GPD. Refer to the attached calculations in Appendix A for additional detail.

Proposed Wastewater Flows & Analysis – Phase 2:

With the second phase of operation, wine production will increase to a maximum of 30,000 gallons per year and winemaking activities will be expanded to include all aspects of winemaking, including on-site processing of fruit. The estimated peak process waste flow from the expanded winery operation is 1,000 GPD. The total process wastewater generated by the expanded operation is estimated at 180,000 gallons per year.

The increases in daily visitation, employee count and marketing events associated with the second phase operation result in a peak domestic wastewater flow of 224 GPD. The annual 100-person marketing event will utilize portable restroom facilities to avoid excessive loading on the domestic wastewater system.

Proposed Wastewater Improvements – Phase 1:

The existing engineered wastewater system has the capacity to serve up to six bedrooms, or 720 gallons per day. There are no changes proposed to the existing four-bedroom main residence, and the main residence will continue to account for 480 gallons per day of system capacity. The remaining 240 gallons per day of system capacity is available for the domestic wastewater flows from the proposed winery and tasting room. The peak domestic wastewater flow calculated for the first phase of winery operation is 187 gallons per day, therefore the existing wastewater system has adequate capacity to serve the proposed use. Therefore, no improvements to the domestic wastewater system are included in phase one.

Proposed Wastewater Improvements – Phase 2:

The peak domestic wastewater flow calculated for the second phase of winery operation is 224 gallons per day, therefore the existing wastewater system has adequate capacity to serve the proposed second phase use. Therefore, no improvements to the domestic wastewater system are included in phase two.

The proposed second phase production expansion requires permitting of the winery under the State Water Resources Control Board's Statewide General Waste Discharge Requirements for Winery Process Water (WDR). With an expected 180,000 gallons of process waste generated annually, the winery will be categorized as a Tier 2 facility. In order to limit the impact of the new winery on groundwater resources, the winery will treat and beneficially reuse the process wastewater in the form of irrigation water for the existing vineyard.

Process wastewater from the winery will be collected and pumped to a treatment and storage facility as depicted on the site plan. The treated wastewater will be stored in tanks and introduced to the existing vineyard irrigation system as needed to provide supplemental irrigation water.

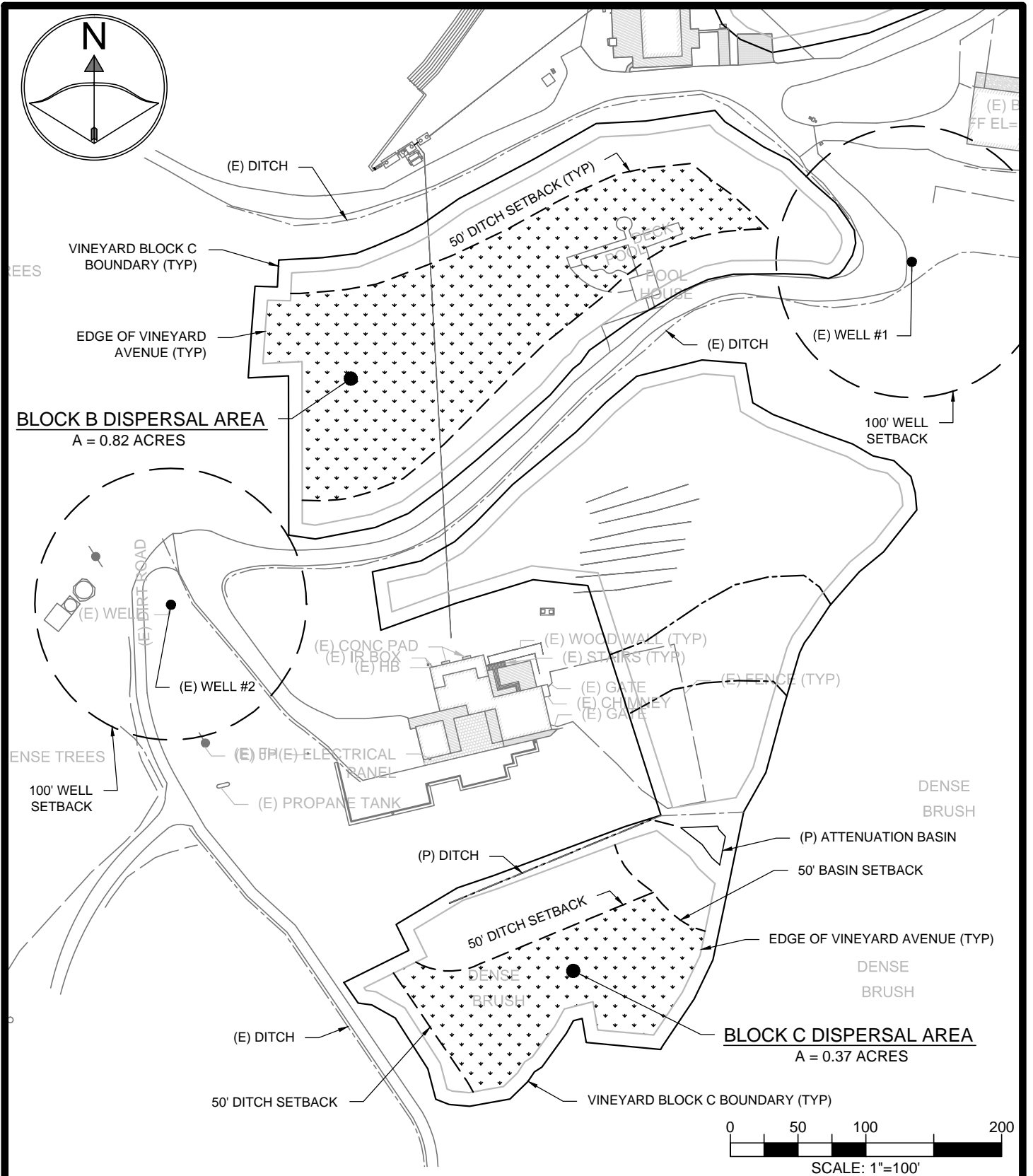
The WDR imposes limits on land application systems to prevent excessive hydraulic, BOD and nitrogen loading. The practical hydraulic loading limit for the existing vineyard is determined by current farming practices. In this case, current practice utilizes a supplemental irrigation rate of 0.5 acre-feet per acre per year. Using this value, 1.10 acres of vineyard is required to dispose of the process wastewater without disrupting established irrigation practices. The WDR imposes a BOD loading limit of 100 pounds

per acre per irrigation cycle day. Assuming a conservative post-treatment effluent BOD concentration of 20 mg/L and four irrigation cycles per year, 0.08 acres of vineyard is required to comply with the BOD loading limit. Lastly, the WDR requires a nitrogen balance calculation to ensure nitrogen is applied at an agronomic rate to the crop. Assuming a conservative post-treatment effluent total nitrogen concentration of 10 mg/L and an estimated agronomic rate of 68.8 pounds of nitrogen per acre, 0.22 acres of vineyard is required to comply with the nitrogen loading limit. Refer to the WDR calculations in Appendix B for additional detail.

There are 3.56 gross acres of approved vineyard on the winery property. After applying the appropriate setbacks for wells and surface watercourses, two areas have been identified for land application of the treated winery process wastewater. Vineyard Block B contains a 0.82 acre dispersal area and Block C contains a 0.37 acre dispersal area for a total of 1.19 acres of identified dispersal area. With 1.10 acres of dispersal area required and 1.19 acres identified, there is ample opportunity to facilitate a future land application process waste disposal system in compliance with the WDR.

Summary and Conclusions

Based on the preceding analysis, the project site has an existing engineered domestic wastewater treatment system and dispersal field with adequate capacity to serve the proposed winery and tasting room. Said system is sized to accommodate the peak daily sanitary wastewater flows of both the first and second phases of winery development. There will be no process waste generated during the proposed first phase of operation. The proposed second phase of winery production will require permitting under the Statewide WDR, and the site's existing vineyard is larger than the area required for the compliant land-application of treated process wastewater. Based on these findings, it is feasible to treat and dispose of the domestic and production wastewater associated with the proposed winery in accordance with County and State requirements.



VINEYARD DISPERSAL AREA MAP

PROJECT INFO:

PROMISE WINERY
2004 SAGE CANYON ROAD
ST. HELENA, CA 94574
APN: 032-520-009

PREPARED BY:

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P #: 00170

DATE: 10/22/24



SHEET: 1 OF 1

Appendix A

Wastewater Flow Calculations



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Project-Specific Wastewater Flow Factors

Table 4 of the Napa County ASTS Standards provide factors for calculating peak wastewater flows. These factors are typically utilized in the wastewater flow calculations supporting this analysis. However, each project has unique characteristics which occasionally necessitate the use of factors not provided in Table 4 of the ASTS Standards. This project-specific analysis utilizes a wastewater flow rate which does not appear in Table 4, and is described in detail below:

Part-time Employee Wastewater Flow: The ASTS Standards provide a flowrate factor of 15 gallons per shift for all employees and does not differentiate between full-time and part-time employees. It is assumed that part-time employees will primarily generate wastewater from restroom breaks and other incidental sink use. New restroom facilities use approximately 1.28 gallons per flush and 0.17 gallons for hand washing, resulting in a total of 1.45 gallons per restroom break. OSHA suggests that employees typically take three restroom breaks per eight-hour shift, resulting in a total of 4.35 gallons per shift of restroom wastewater flow. Rounding up to 5 gallons per shift for restroom use and allowing for an additional 3 gallons of wastewater per shift for other activities, we arrive at an estimated wastewater flow factor of 8 gallons per part-time employee shift as a reasonable estimate for the purpose of this analysis.



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Winery Wastewater Flow Calculations

for Phase 1 of the proposed
Promise Winery

Located at:
2004 Sage Canyon Road
St. Helena, CA 94574

Date: 12/6/2023
Rev 1: 4/18/2024

Project # 00170

Legend

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Winery Waste Flow Summary

These wastewater calculations are for the first phase of a proposed winery. The calculations are to establish the expected peak process and domestic daily flows. They also estimate the annual domestic and process water use. For this first phase of the proposed winery, production will be limited to barrel fermentation and barrel aging of wine. No on-site processing of grapes will occur during this phase of operation. As such, process waste generated during this phase of operation is considered negligible.

Winery Proposed Peak Process Wastewater Flows

Wine Production =	5000	gal/yr
Crush Duration =	0.00	days (30 -60)
Peak Process Waste Flows During Crush =	0.00	gal/day ((1.5 x production)/crush days)
Average Process Flows (non crush) =	0.00	gal/day ((6 x production)/days in yr)
Additional Process Flow =	0.00	gal/day (usually 0)
Winery Peak Process Waste Flows =	0.00	gal/day

Proposed Domestic Peak Wastewater Flows

Number of FT Employees =	2	#
Number of PT Employees =	1	#
Number of daily visitors =	8	#
Event people count serviced by this system =	25	#
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	8.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	24.00	gal/day (3 g/p)
Event daily domestic waste flow =	125.00	gal/day (5 g/p)

Winery Peak Domestic Wasteflows =	187.00	gal/day
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Combined Winery Waste Annual Volume Calculations

Winery Annual Combined Process & Domestic Waste Flows

Number of FT Employees =	2	#
Number of PT Employees =	1	#
FT employee daily domestic waste flow =	30	gal/day (15 g/p)
PT employee daily domestic waste flow =	8	gal/day (8 g/p)
Number of Employee Flow Days =	365	days/yr
Annual employee domestic waste flow =	13870	gal/yr
Number of annual visitors =	2912	#
Annual visitor domestic waste flow =	8736	gal/yr (3 g/p)

Special Event Visitor Volumes	visitors	days/yr	g/p/day	gallons
Large Events = (served by portable facilities)	0	0	0	0
Medium Events =	0	0	5	0
Small =	25	2	5	250
Very Small =	0	0	5	0

Total Annual Event Visitor Waste Volume =	250	gal/year		
Total annual domestic wastewater volume =	22856	gal/yr	0.07	af
Total annual process wastewater volume =	0	gal/yr	0.00	af
Total Winery Wastewater Annual Vol =	22856	gal/yr	0.07	af



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Winery Wastewater Flow Calculations for Phase 2 of the proposed Promise Winery

Located at:
2004 Sage Canyon Road
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Date: 12/6/2023

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Requires Input
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Winery Waste Flow Summary

These wastewater calculations are for the second phase of a proposed winery. The calculations are to establish the expected peak process and domestic daily flows. They also estimate the annual domestic and process water use.

Winery Proposed Peak Process Wastewater Flows

Wine Production =	30000	gal/yr
Crush Duration =	45	days (30 -60)
Peak Process Waste Flows During Crush =	1000.00	gal/day ((1.5 x production)/crush days)
Average Process Flows (non crush) =	493.15	gal/day ((6 x production)/days in yr)
Additional Process Flow =	0.00	gal/day (usually 0)
Winery Peak Process Waste Flows =	1000.00	gal/day

Proposed Domestic Peak Wastewater Flows

Number of FT Employees =	2	#
Number of PT Employees =	3	#
Number of daily visitors =	15	#
Event people count serviced by this system =	25	#
FT employee daily domestic waste flow =	30.00	gal/day (15 g/p)
PT employee daily domestic waste flow =	24.00	gal/day (8 g/p)
Visitor daily domestic waste flow =	45.00	gal/day (3 g/p)
Event daily domestic waste flow =	125.00	gal/day (5 g/p)

Winery Peak Domestic Wasteflows =	224.00	gal/day
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Combined Winery Waste Annual Volume Calculations

Winery Annual Combined Process & Domestic Waste Flows

Number of FT Employees =	2	#
Number of PT Employees =	3	#
FT employee daily domestic waste flow =	30	gal/day (15 g/p)
PT employee daily domestic waste flow =	24	gal/day (8 g/p)
Number of Employee Flow Days =	365	days/yr
Annual employee domestic waste flow =	19710	gal/yr
Number of annual visitors =	5460	#
Annual visitor domestic waste flow =	16380	gal/yr (3 g/p)

Special Event Visitor Volumes	visitors	days/yr	g/p/day	gallons
Large Events = (served by portable restrooms)	100	1	5	500
Medium Events =	0	0	5	0
Small =	25	6	5	750
Very Small =	0	0	5	0

Total Annual Event Visitor Waste Volume =	1250	gal/year		
Total annual domestic wastewater volume =	37340	gal/yr	0.11	af
Total annual process wastewater volume =	180000	gal/yr	0.55	af
Total Winery Wastewater Annual Vol =	217340	gal/yr	0.67	af

Appendix B

Statewide WDR Calculations



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Statewide WDR Feasibility Calculations for Phase 2 of the proposed Promise Winery

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WDR Feasibility Calculations

Below are calculations supporting the feasibility of compliance under the Statewide General Waste Discharge Requirements for Winery Process Water for the proposed 30,000 gallon Promise Winery. These calculations are based on conservative post-treatment waste characteristics and loading rates in order to establish the probable maximum size of a future discharge area that meets the above said Waste Discharge Requirements. These calculations are conservative and for establishing feasibility only.

Winery Process Waste Characteristics

Process Waste Generated =	180000	gal/yr
Treated Effluent BOD =	20	mg/L
Treated Effluent Total Nitrogen =	10	mg/L

Loading Calculations

Hydraulic Loading

Vineyard Irrigation Demand =	0.5	AF/ac/yr
Process Wastewater for Irrigation =	0.55	AF/yr
Vineyard Acres Req'd to dispose of PW =	1.10	acres

BOD Loading

BOD Generated =	30	lb/yr
Number of Irrigation Cycles =	4	day/yr
BOD Loading Limit =	100	lb/ac/day
Vineyard Acres Req'd per BOD Limit =	0.08	acres

Nitrogen Uptake

Total Nitrogen Generated =	15	lb/yr
Agronomic Nitrogen Rate for Vineyards =	68.8	lb/ac
Vineyard Acres Req'd per Nitrogen Uptake =	0.22	acres

Expected Maximum Application Area Req'd =	1.10	acres
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Available Land Application Area =	1.19	acres
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