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Water System Feasibility Report

Ladera Vineyards Winery
Minor Modification P21-00294-MOD and Viewshed P22-00109
Planning Commission Hearing May 3, 2023

Water System Feasibility Report

for

Ladera Vineyards

3942 Silverado Trail N
Calistoga, Napa County, CA

L A D E R A

Napa Valley



Winery Use Permit Minor Modification
#P21-00294

Revised July 2022



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ATTACHMENTS

1. Well Completion Report
2. Water Calculations (from the project Water Availability Analysis)

1.0 PROJECT SUMMARY

The project is proposing a minor modification to an existing winery Use Permit under the Napa County Streamlining Ordinance (Ordinance No. 1455). The existing winery is located at 3942 Silverado Trail North in Calistoga, CA. The project is proposing a moderate staff and event increase and is maintaining the existing wine production limit of 20,000 gallons annually. The project proposes removal of existing structures, a new Type III cave for barrel aging, fermentation, and production offices, as well as a remodel of the existing tasting room building. The existing driveway will remain and be improved to meet current jurisdictional requirements as well as additional parking areas added.

The project also proposes three full time and two part time staff members. Proposed visitation to the winery includes 30 maximum visitors for winery tours and tastings daily and 210 maximum visitors per week. Two semi-annual wine club events for up to 50 guests will be held approximately every six months. Food service at marketing events will include food and wine pairing dinners. All food service is to be catered and consistent with the definitions of “Tours and Tastings” and “Marketing of Wine” per the Napa County Code.

1.1 SITE DESCRIPTION

The 7.44-acre subject parcel is located off Silverado Trail between Calistoga and St. Helena in the unincorporated area of Napa County. The south westerly portion of the subject parcel that borders the Silverado Trail is relatively flat with slopes less than five percent. The parcel then slopes upward away from Silverado Trail and consists primarily of dense woodland cover.

1.1.1 *Land Use*

The property sits at the border of the Napa Valley region which is predominantly Agricultural Preserve and Watershed (AP and AW) zoned parcels. These parcels consist of existing vineyards, wineries, and residences. The subject parcel is currently developed with an existing residence as well as an older winery and barn structures. An existing vineyard, landscaped areas, and driveway are also located within the flatter portion of the subject parcel. The current land use of the subject parcel is consistent with the proposed improvements summarized above.

1.1.2 *Water Use*

The site includes two existing wells. The existing wells are located within the Napa Valley Floor-Calistoga groundwater zone.

2.0 WATER SYSTEM OVERVIEW

2.1 Classification

Based on the proposed uses included with the winery Use Permit Minor Modification, the onsite public water system will be classified as a transient noncommunity (TNC) public water system per the State of California Drinking Water Requirements.

2.2 Water System Information

The following is an outline of the proposed public water system.

Name: Ladera Vineyards

Report Preparer: Christina Nicholson, P.E., Sherwood Design Engineers

2.2.1 Well Information

The project well includes a 50-foot seal and a 5-inch casing.

2.2.1.1 System Description

The existing water system source includes two existing wells. One of the wells, which is in the existing shed, has a well log on file. The other well that is located outside and near the shed does not have a well log (that could be found) and is therefore not proposed to be part of this project.

The existing water system (tanks, utilizes, treatment devices, etc..) will not be used as part of the proposed project and will be demolished as part of the improvements.

Water is proposed to be pumped from the project well to the proposed water storage tanks that will be installed approximately 750-ft north up the hill beneath what is currently an existing unpaved access road. One of the proposed below ground storage tanks will be a 50,000-gallon fire protection and irrigation water storage tank. The other proposed below ground tank will be a 15,000-gallon domestic water storage tank. The pipe system to/from the well to the water tanks will utilize a shallow buried joint trench for conveyance up and down the hillside. Water supply piping to the existing residence, proposed cave, proposed tasting room, proposed irrigation, and fire protection lines, will be supplied by a proposed joint trench branch that branches off the uphill joint trench run, and extends west on grade, south of the proposed cave, north of the other site improvements.

Water quality will be analyzed post use permit approval and adequate treatment and disinfection will be included with the water system per the CA Drinking Water and Napa County Planning, Building, and Environmental Services Requirements.

3.0 WATER DEMAND

Based on water use estimates from Section 2.2 in the Water Availability Analysis Report revised on July 2022, prepared for this Use Permit Minor Modification application, the total demand for groundwater on the site is estimated to be:

- Residential Demand = 0.40 acre-feet/year (130,340 gallons/year)
- Winery Domestic Demand = 0.18 acre-feet/year (58,653.2 gallons/year)
- Winery Process Water = 0.37 acre-feet/year (120,565 gallons/year)
- Vineyard Irrigation = 0 acre-feet/year
- Landscape Irrigation = 0.59 acre-feet/year (192,252 gallons/year)

- **Total Water Usage = 1.54 acre-feet/year (501,811 gallons/year)**

The average daily annual demand is estimated to be 1,375 gallons per day (gpd). Assuming a normal pumping time of eight-hours per day from the well, the annual water demand would require a well yield of approximately 2.8 gallons per minute (gpm). The well's estimated yield capacity is estimated to be 50 gpm per minute as referenced in Section 4 below. However, per the Water Availability Analysis the well pump rate will be reduced to 9 gpm maximum which is more than sufficient to satisfy the project demands.

The estimated peak daily water demand from the proposed winery domestic water demand is estimated to be 585 gpd and 1,400 gpd for winery process water (1,985 gpd total). Refer to the project wastewater feasibility study for additional information.

Vineyard irrigation water is proposed to be sourced by the winery wastewater treatment system and is not included as a water demand from the water system. Based on the Model Water Efficient Landscape Ordinance (MWELO) for the proposed landscape design, the peak water usage month occurs during July and includes 30,808 gallons per month. This is equivalent to 2,054 gpd assuming the alternate irrigation days. A discussion of the landscape irrigation demand and MWELO calculations are included in the project Water Availability Analysis as well as attached with this report.

The sum of all the estimated peak daily water demands discussed above is calculated to be 4,039 gpd on a peak day scenario. Per State Water Board guidelines, the water system maximum daily demand (MDD) is 1.5 times greater than the estimated peak daily demand. Therefore, the MDD is 6,059-gallons. Also, per State Water Board guidelines, the water system must provide storage capacity equal to or greater than MDD. The proposed domestic water system storage capacity of 15,000-gallons exceeds the MDD. There are no known plans for expansion within the next ten years that would require additional water from the system.

4.0 SOURCE ADEQUACY

The project well includes a 50-foot seal and a 5-inch casing. This well has been maintained and is currently utilized as the water source for the existing winery and existing residence. The well was completed in 2007, under permit E-07-000815. A copy of the Well Completion Report is provided in the Appendix. It should be noted that this well was drilled and constructed to meet the standards of a public water system.

5.0 WATER SUPPLY CAPACITY

The water supply is adequate to support the proposed winery improvements. According to the completion log of the 2007 well, the estimated well yield is 50 gallons per minute. The well's estimated yield capacity is estimated to be 50 gpm per minute as referenced in Section 4 below. However, per the Water Availability Analysis the well pump rate will be reduced to 9 gpm maximum which is more than sufficient to satisfy the project demands. An eight hour well pump test will be performed following project approval to establish the well yield.

Based on the proposed maximum domestic water storage capacity of 15,000 gallons, the system can supply approximately 10-gallons per minute for 24-hours. This exceeds the minimum three gallons per minute for at least 24-hours for each service connection required of the system per the rules of the water system technical, managerial, and financial capacity worksheet provided by Napa County Environmental Services. This report assumes there are two service connections (Winery and Residence) requiring a minimum total of six gallons per minute.

6.0 WATER QUALITY CHARACTERIZATION

At the time of this report water quality testing of water from the well has not been conducted or is unavailable. Water quality testing will be conducted prior following project approval and prior to initial submittal of building permit documentation to Napa County for the proposed winery and water system improvements.

7.0 CONSOLIDATION EVALUATION

The winery parcel is in the unincorporated zone of Napa County. It is approximately three miles outside of the City of Calistoga boundary line. The City of Calistoga does not provide municipal water to this area. There may be additional small public water systems at existing nearby wineries, but due to water rights complications and the steep hillside terrain of this area, consolidation with one of these existing water systems is not feasible.

7.1 Managerial Capacity

7.1.1 *Water System Management*

Winery ownership oversees both the winery operations and the water system. The winery personnel, as designated by the owner, will manage daily aspects of the winery water system and a maintenance provider may be contracted to service the well and water system equipment as needed.

7.1.2 *Water Rights*

The well and water system shall service the project parcel only and is under the same ownership as the subject parcel.

7.2 Financial Capacity

Operation of the existing water system is currently funded by revenue from the existing winery. The proposed winery includes an established brand that has existing revenue to support the initial cost of the water system. Due to anticipated increase in revenue from the expanded marketing plan, the winery's ability to support operations of the water system is considered financially feasible.

8.0 CONCLUSION

The project proposes to develop a public water system on the subject parcel per CA Drinking Water and Napa County PBES requirements. The existing well and proposed infrastructure will be adequately sized to support and provide water supply for the proposed project. Following project approval and prior to building permit approval, a public water system permit will be secured for the public water system.

Attachment 1:

Well Completion Report

QUADRUPPLICATE
For Local Requirements

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. **1073647**

Page ___ of ___

Owner's Well No. _____

Date Work Began 09/12/03/07, Ended 12/12/07

Local Permit Agency Napa County

Permit No. E-07-00815 Permit Date 11/01/2007

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

GEOLOGIC LOG

WELL OWNER

ORIENTATION (∠) VERTICAL _____ HORIZONTAL _____ ANGLE _____ (SPECIFY)
DRILLING METHOD Rotary FLUID Mud

Name _____
Mailing Address _____
CITY _____ ZIP _____

DEPTH FROM SURFACE
Fl. to Fl.

DESCRIPTION

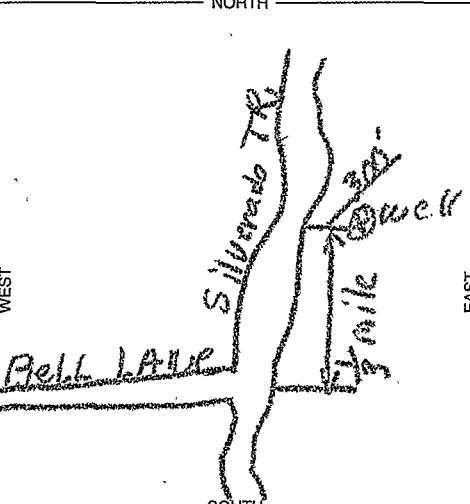
Describe material, grain size, color, etc.

WELL LOCATION

Address 3047 S. Surrado TR
City Calistoga
County Napa
APN Book 021-03 Page 047-000 Parcel _____
Township _____ Range _____ Section _____
Lat _____ N Long _____ W

0	40	Brown Clay & Ash
40	60	Hard Gray Rock
60	110	Hard Brown & Gray Rock
110	120	Hard Gray Rock
120	170	Hard Brown, Gray & White Rock
170	190	Brown Ash
190	230	White Clay
230	300	Green Ash
300	370	Green Sandy Clay

LOCATION SKETCH



ACTIVITY (∠)

- NEW WELL
- MODIFICATION/REPAIR
 - ___ Deepen
 - ___ Other (Specify) _____
- DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")
- USES (∠)
 - WATER SUPPLY
 - Domestic ___ Public
 - Irrigation ___ Industrial
 - MONITORING ___
 - TEST WELL ___
 - CATHODIC PROTECTION ___
 - HEAT EXCHANGE ___
 - DIRECT PUSH ___
 - INJECTION ___
 - VAPOR EXTRACTION ___
 - SPARGING ___
 - REMEDIATION ___
 - OTHER (SPECIFY) _____

RECEIVED

DEC 24 2007

DEPT. OF ENVIRONMENTAL MANAGEMENT

TOTAL DEPTH OF BORING 370 (Feet)
TOTAL DEPTH OF COMPLETED WELL 350 (Feet)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 44 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 50 (Ft.) & DATE MEASURED 12-12-07
ESTIMATED YIELD 50 (GPM) & TEST TYPE Air Lift
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN 44 (Ft.) GPM at day
* May not be representative of a well's long-term yield. of test

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	CASING (S)					DEPTH FROM SURFACE Ft. to Ft.	ANNULAR MATERIAL					
		TYPE (∠)				MATERIAL / GRADE		INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	TYPE		
		BLANK	SCREEN	CON-DUCTOR	FILL PIPE							CE-MENT (∠)	BEN-TONITE (∠)
0	52	11	✓			Plastic 5	1480						
52	90	8	✓			"	"						
90	350	8	✓			"	"					W/ 11" Rock Ground	

ATTACHMENTS (∠)

- ___ Geologic Log
- ___ Well Construction Diagram
- ___ Geophysical Log(s)
- ___ Soil/Water Chemical Analyses
- ___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Pulliam Well Exploration

(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

5110 Highway 128, Napa, CA 94558

ADDRESS

CITY

STATE

ZIP

Signed Tom Pulliam

C-57 LICENSED WATER/WELL CONTRACTOR

DATE SIGNED 12-23-07

808 508
C-57 LICENSE NUMBER

Attachment 2:

Water Calculations (from the project Water Availability Analysis)

PROPOSED WATER DEMAND - LADERA VINEYARDS

RESIDENTIAL USES	Proposed Change	DESCRIPTION	WATER DEMAND	NOTES
Main Residence	Fixtures retrofitted to be low flow (decrease)	3 bedroom residence	0.40 acre-feet/year	Based on wastewater generation rates; 120 gallons/bedroom/day, 365 days per year
Studio Cottage	Repurposed as a garden storage shed (decrease)	1 bedroom studio	0.00 acre-feet/year	
WINERY USES				
Wine Production	No change	20,000 gallons wine/year	0.37 acre-feet/year	Based on wastewater generation rates (see WWFS)
Employees	Increase	5 full time employees	0.08 acre-feet/year	Assumes 15 gallons per employee per day (see WWFS); winery open 365 days/year
Visitors	Increase	10,860 annual visitors	0.10 acre-feet/year	Assumes 3 gallons per guest per day (see WWFS); winery open 365 days/year
VINEYARD/LANDSCAPE				
Vineyard Irrigation	Irrigated with treated process wastewater (decrease)	0.75 acres	0.00 acre-feet/year	Irrigated with treated process wastewater
Landscape Irrigation	Increase	0.04 acres	0.59 acre-feet/year	Calculated based on MWELo requirements
Pool Water Usage (uncovered)	Removed (decrease)		0 acre-feet/year	
Total			1.55 acre-feet/year	

Model Water Efficient Landscape Ordinance (MWELo)

Landscape Irrigation Calculations

MAWA = Maximum Applied Water Allowance (gallons per year)
 ETo = Reference Evapotranspiration from Appendix A (inches per year)
 0.7 = ET Adjustment Factor (ETAF)
 LA = Landscaped Area includes Special Landscape Area (square feet)
 0.62 = Conversion factor (to gallons per square foot)
 SLA = Portion of the landscape area identified as Special Landscape Area (square feet)
 0.3 = the additional ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3)

Project Specific Climate Data

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
ETO ¹ (in)	1.2	1.5	2.8	3.9	5.1	6.1	7	6.2	4.8	3.1	1.4	0.9	44.00 in/year
Rainfall (in) ²	6.3	6.33	6.27	2.14	0.92	0.38	0	0	0.22	2.45	3.66	6.88	35.55 in/year
Eppt (in)	1.575	1.5825	1.5675	0.535	0.23	0.095	0	0	0.055	0.6125	0.915	1.72	8.89 in/year

Landscape Design Information

Planter Areas ³	Area (sf)	PF	CF	SLA	IE
A	4,035	0.4	0.62	0	0.71
B	3,000	0.4	0.62	0	0.71
C	5,420	0.4	0.62	0	0.71
D	145	0.4	0.62	0	0.71
Total	12,600	sf			
	0.04	acres			

MAWA w/ Eppt

If considering Effective Precipitation, use 25% of annual precipitation. Use the following equation to calculate Maximum Applied Water Allowance:

$$MAWA = (ETo - Eppt) (0.62) [(0.7 \times LA) + (0.3 \times SLA)]$$

Planter Areas ³	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A	0	0	2,158	5,893	8,528	10,516	12,258	10,857	8,309	4,356	849	0	63,726 gal/year
B	0	0	1,605	4,381	6,341	7,819	9,114	8,072	6,178	3,239	631	0	47,380 gal/year
C	0	0	2,899	7,915	11,456	14,125	16,466	14,584	11,162	5,851	1,141	0	85,599 gal/year
D	0	0	78	212	306	378	441	390	299	157	31	0	2,290 gal/year
Total	0	0	6,740	18,401	26,631	32,838	38,279	33,904	25,948	13,603	2,652	0	198,995 gal/year
													0.61 acre-feet/year

ETWU

$$ETWU = (ETo)(0.62) \left(\frac{PF \times HA}{IE} + SLA \right)$$

where:

ETWU = Estimated total water use per year (gallons per year)
 ETo = Reference Evapotranspiration (inches per year)
 PF = Plant Factor from WUCOLS (see Definitions)
 HA = Hydrozone Area [high, medium, and low water use areas] (square feet)
 SLA = Special Landscape Area (square feet)
 0.62 = Conversion Factor (to gallons per square foot)
 IE = Irrigation Efficiency (minimum 0.71)

Planter Areas ³	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
A	1,691	2,114	3,946	5,497	7,188	8,597	9,866	8,738	6,765	4,369	1,973	1,268	62,014 gal/year
B	1,257	1,572	2,934	4,087	5,344	6,392	7,335	6,497	5,030	3,248	1,467	943	46,107 gal/year
C	2,272	2,840	5,301	7,383	9,655	11,548	13,252	11,738	9,087	5,869	2,650	1,704	83,300 gal/year
D	61	76	142	198	258	309	355	314	243	157	71	46	2,229 gal/year
Total	5,281	6,602	12,323	17,164	22,446	26,847	30,808	27,287	21,125	13,643	6,162	3,961	193,650 gal/year
													0.59 acre-feet/year

Notes/References

1. ETO values are referenced from Appendix A - Reference Evapotranspiration (ETO) Table from the Model Efficient Landscape Ordinance (WELO) for St. Helena
2. Monthly average rainfall amounts are taken from PRISM <https://prism.oregonstate.edu/> for the project site (4km cell) and averaged monthly from Jan 2012 to Jan 2022
3. Refer to the Planter Area Exhibit for the location and description of plant types; the subsurface drip dispersal field area has been removed from area C since that area will be irrigated with treated wastewater.



Silverado Trail

Landscape

Quantity	Symbol	Description
California Natives		
66		Arctostaphylos densiflora 'Howard Mc Minn' / 'Howard McMin' - Manzanita 15 Gallon
36		Arctostaphylos 'Pacific Mist' / Manzanita 'Pacific Mist' 5 gallon
51		Arctostaphylos 'Sunset' / Manzanita 'Sunset' 5 Gallon
33		Salvia clevelandii 'Winifred Gilman' / 'Winifred Gilman' Cleveland Sage 5 gallon
Grasses & Grass-Like Plants		
70		Bouteloua gracilis 'Blonde Ambition' / 'Blonde Ambition' Blue Grama 1 gallon
19		Carex tumulicola / Berkeley Sedge 1 gallon
31		Miscanthus sinensis 'Morning Light' / 'Morning Light' Japanese Silver Grass 5 Gallon
73		Pennisetum orientale 'Karly Rose' / Karly Rose Pennisetum 5 gallon
Ground Cover-Vines		
73		Cotoneaster dammeri 'Lowfast' / Bearberry Cotoneaster 1 gallon
5		Parthenocissus tricuspidata / Boston Ivy Each
28		Rosemarinus prostratus 'Irene' / Irene Rosemary 1 gallon

Herbaceous Perennials		
57		Geranium 'Rozanne' / Geranium 'Rozanne' 1 gallon
78		Lavandula angustifolia / English Lavender 1 gallon
96		Rudbeckia fulgida speciosa 'Goldsturm' / Coneflower, Goldsturm 1 Gallon
Shrubs Under 4 Feet		
67		Berberis thubergii 'Rose Glow' / Rose glow berberis 5 gallon
24		Chaenomeles speciosa / Quince, Texas Scarlet 5 Gallon
6		Daphne odora 'Marginata' / Veriagated Winter Daphne 5 Gallon
16		Loropetalum chinense / Chinese Fringe Flower 5 gallon
Taller Shrubs		
4		Arbutus Unedo 'Compacta' / Strawberry Madrone 24" Box
22		Plumbago auriculata 'Monott' / Royal Cape Plumbago 5 gallon
Trees		
5		Acer palmatum 'Oshio Beni' / Oshio Beni Japanese Maple 36 inch
4		Arbutus 'Marina' / Marina Madrone 36" Box
6		Lagerstroemia indica 'Muskogee' Multi Trunk / Multi Trunk Muskogee Crepe Myrtle 36" Box

SHEET:
1 of 1
L-1

SCALE:
1" = 20'

CHECKED BY:
Doug Osborn

DRAWN BY:
Rodney Rose

JOB NUMBER:
22322

DATE:
3-29-2022

REVISIONS:
3-1-2022
3-2-2022
3-9-2022
3-14-2022
3-28-2022

PROJECT:
Ladera Winery
Silverado Trail
Calistoga, CA 94515

SHEET DESCRIPTION:
Landscape Planting Plan
**PLANTER AREA
EXHIBIT FOR WELO
CALCULATIONS**

Autumn Skies Landscape
PO Box 381
St. Helena, CA 94574
Rodney's Cell # 707-328-1673