SUPPLEMENTAL WATER AVAILABILITY ANALYSIS FOR INTERIM PROGRAM

For

DIAMOND CREEK VINEYARDS
1500 DIAMOND MOUNTAIN ROAD
CALISTOGA, CALIFORNIA 94515

APN 020-440-004 & 020-400-012

Prepared For:
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Project #4120020.0
December 3, 2025

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EXECUTIVE SUMMARY

This Water Availability Analysis determines the groundwater usage for the interim program at Diamond Creek Vineyards (APN 020-440-004). This report is supplemental to the detailed Water Availability Analysis previously prepared and submitted for the Use Permit Modification. The water usage under the interim program will be in effect prior to the proposed Use Permit Modification program and associated improvements being realized.

The current winery is permitted to produce 10,000 gallons per year. The interim winery program proposes no increase in production. The interim program proposes to decrease visitors from 22/day to 10/day, but allow for an increase from 47/week to 60/week. The number of marketing events will increase from five to eleven (5 to 11), but the total number of marketing guests will reduce from 500 to 350. The interim program proposes no change to the number of employees which will remain at six (6) full-time and two (2) part-time employees.

The proposed interim changes to visitation will result in no increase to water demand, but a reduction in water usage will be achieved by reduction in vineyard irrigation as detailed in the Water Availability Analysis for the Use Permit Modification.

Table 1: Groundwater Use Calculations

Usage Type	Existing Usage [af/yr]	**Proposed Interim Usage [af/yr]**	Proposed Standard Usage [af/yr]	Proposed Reduced Usage [af/yr]
Vineyard				
Irrigation – Well	10.75	**9.66**	9.66	9.66
Irrigation – Recycled Process Wastewater (Credit)	0	**0**	-0.46	-0.46
Landscaping	0.05	**0.05**	0.13	0.13
Residential				
Existing Residence	0.75	**0.75**	0.75	0.75
Proposed Residence	0	**0**	0.75	0.75
Winery				
Process Water	0.22	**0.22**	0.54	0.46
Domestic Water	0.15	**0.15**	0.17	0.17
Totals (Acre-ft per Year)	**11.92**	**10.82**	**11.54**[1]	**11.46**[1]
Estimated Water Recharge Rate (Acre-ft per Year)	**46.15**[1]	**46.15**[1]	**46.15**[1]	**46.15**[1]

The proposed interim program for the Diamond Creek Vineyards project will result in a decrease in the use of groundwater by 1.10 af/yr when compared to the existing condition, and a reduction of 0.64 af/yr when compared to the proposed Use Permit Modification program. The proposed interim program total usage of 10.82 af/yr is also less than the estimated groundwater recharge rate for the parcel of 46.15 af/yr.

[1] These totals are detailed in depth as part of the Use Permit Modification Water Availability Analysis. Refer to that report for more information.

GROUNDWATER RECHARGE

The total groundwater usage will be below the estimated ground water recharge rate for the site. A detailed calculation of the groundwater recharge rate has been shown in the Use Permit Modification Water Availability Analysis under separate cover. A groundwater recharge rate was calculated for the site and found to be 0.63 ac-ft/ac/yr. This provides an annual allowable water allotment of 46.15 ac-ft/yr for the proposed 73.26-acre parcel.

VINEYARD IRRIGATION

Diamond Creek Vineyards is proposing to revise their vineyard irrigation to reduce water usage and have identified four (4) vineyard blocks which total 3.1 acres which are suitable for dry farming. The blocks identified for dry farming will be irrigated after their initial replant. Irrigation will be tapered off over a period of five (5) years until dry farming is achieved. In addition to dry farming, the winemaker has evaluated three (3) sub-blocks north of Diamond Creek which are suitable for a 20% reduction in vineyard irrigation. A detailed calculation of the groundwater recharge rate has been shown in the Use Permit Modification Water Availability Analysis under separate cover.

Due to the timeline of the site improvements, water usage from 2025 is shown as part of the Groundwater Use Calculation on page 4.

TIER II ANALYSIS – WELL PROXIMITY TO NEIGHBORING WELLS

The only well onsite that is within 500 feet of a neighboring well is the existing project well identified as Well #1 in the Use Permit Modification Water Availability Analysis. Per Napa County Well Permit Standards and WAA Requirements Table dated January 2024, Footnote 8, the Tier II analysis is only required if there is an increase in groundwater use at the site. Since (a) the project will reduce overall groundwater usage and (b) more particularly, demand on Well #1 will be less as part of the overall reduction in use, a Tier II analysis is not required.

TIER III ANALYSIS – WELL PROXIMITY TO SIGNIFICANT STREAMS

A detailed Tier III analysis was completed as part of the Use Permit Modification Water Availability Analysis, and since the proposed interim program modifications will have a lower groundwater usage than the proposed Use Permit Modification program, the same conclusion can be drawn that impacts will be reduced relative to existing conditions and thereby meet the requirements of The County of Napa's January 10, 2024 Tier III Water Availability Analysis guidance memorandum.

DETAILED GROUNDWATER USE CALCULATIONS

Detailed below and on the following page are summaries of the existing and proposed interim water usage only and detailed calculations of water usage for the proposed Use Permit Modification can be found in the separate report.

Existing Water Demand

Existing Vineyard Irrigation and Landscaping Water Demand					
Vineyard – Irrigation from well – (0.5 af/ac-yr x	21.5	acres vineyard) =		10.75	af/yr
Vineyard – Irrigation from PWW Credit	0	acres vineyard) =		0.00	af/yr
Landscape – (0.5 af / 100,000-gallon wine x	10,000	gal wine/year) =		0.05	af/yr
Existing Winery Process Water Demand					
Process Water – (2.15 af / 100,000-gallon wine x	10,000	gal wine/year) =		0.22	af/yr
Existing Residential Water Demand					
Residence on Adj. Parcel Domestic Water – (Main Dwelling – 0.75 af/yr x	1	dwelling) =		0.75	af/yr
Existing Winery Domestic Water Demand					
FT Employees – (15 gal/person/day x 313 days/yr x	6	employees/day) =		0.086	af/yr
PT Employees – (15 gal/person/day x 165 days/yr x	2	employees/day) =		0.015	af/yr
Average Visitors [2] – (3 gal/person/day x 52 wks/yr	47	visitors/wk) =		0.023	af/yr
Marketing Events [3] – (100 visitors @ 15 gal/guest x	5	days/yr) =		0.023	af/yr
			Total =	0.147	af/yr
			Total =	0.15	af/yr
Total Existing Water Demand			**Total =**	**11.92**	**af/yr**

Proposed Interim Water Demand

Proposed Interim Vineyard Irrigation and Landscaping Water Demand					
Vineyard – Irrigation from well – (0.5 af/ac-yr x	21.5	acres vineyard) =		9.66	af/yr
Vineyard – Irrigation from PWW Credit	0	acres vineyard) =		0.00	af/yr
Landscape – (0.5 af / 100,000-gallon wine x	10,000	gal wine/year) =		0.05	af/yr
Proposed Interim Winery Process Water Demand					
Process Water [(1)] – (2.15 ac-ft/100,000 gallons wine)	10,000	gal wine/year) =		0.22	af/yr
Proposed Interim Residential Water Demand					
Residence on Adj. Parcel Domestic Water – (Main Dwelling – 0.75 af/yr x	1	residence		0.75	af/yr
Proposed Interim Winery Domestic Water Demand					
FT Employees – (15 gal/person/day x 313 days/yr x	6	employees/day) =		0.086	af/yr
PT Employees – (15 gal/person/day x 165 days/yr x	2	employees/day) =		0.015	af/yr
Average Visitors [(2)] – (3 gal/person/day x 52 weeks	60	visitors/week		0.029	af/yr
Marketing Events [(3)] – (30 visitors @ 15 gal/guest x	10	days/yr) =		0.014	af/yr
Marketing Event [(3)] s – (50 visitors @ 15 gal/guest x	1	days/yr) =		0.002	af/yr
			Total =	0.146	af/yr
			Total =	0.15	af/yr
Total Proposed Water Demand			**Total =**	**10.82**	**af/yr**

Estimates per Napa County Water Availability Analysis – Guidance Document, May 12, 2015 unless noted:

[(1)] 2.15 ac-ft per 100,000 gallons wine per Napa County WAA – Guidance Document
[(2)] 3 gallons of water per guest per Napa County WAA – Guidance Document
[(3)] 15 gallons of water per guest per Napa County WAA – Guidance Document

WATER AVAILABILITY ANALYSIS

For

DIAMOND CREEK VINEYARDS
1500 DIAMOND MOUNTAIN ROAD
CALISTOGA, CALIFORNIA 94515

APN 020-440-004 & 020-400-012

PREPARED FOR:
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Project #4120020.0
May 23, 2025

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EXECUTIVE SUMMARY

Diamond Creek Vineyards (APN 020-440-004) is applying for a Use Permit Modification to construct a new winery building and to modify the existing winery building into a four (4) bedroom residence once the new winery building is operational. The current winery is permitted to produce 10,000 gallons per year. The new winery proposes an increase in production from 10,000-gal wine/year to 25,000-gal wine/year. The project proposes to decrease from 22 visitors/day to 10 visitors/day, but allow for an increase from 47/week to 60/week. The number of marketing events will be reduced from five to two (5 to 2), and the number of employees will increase from six (6) full-time and two (2) part-time employees to eight (8) full-time and two (2) part-time employees.

The increase in water demand from the proposed changes to production and visitation will be offset by modifications to the vineyard irrigation processes and utilization of treated process wastewater for vineyard irrigation. Reduction will be achieved by the establishment of dry farming 3.1 acres of vineyard over a period of five years, and by reducing irrigation to a portion of the largest vineyard block by 20%. An exhibit showing vineyard areas can be found in Appendix 1.

Table 1: Groundwater Use Calculations

Usage Type	Existing Usage [af/yr]	Proposed Standard Usage [af/yr]	Proposed Reduced Usage [af/yr]
Vineyard			
Irrigation – Well	10.75	9.66	9.66
Irrigation – Recycled Process Wastewater (Credit)	0	-0.46	-0.46
Landscaping	0.05	0.13	0.13
Residential			
Existing Residence	0.75	0.75	0.75
Proposed Residence	0	0.75	0.75
Winery			
Process Water	0.22	0.54	0.46
Domestic Water	0.15	0.17	0.17
Totals (Acre-ft per Year)	**11.92**	**11.54**	**11.46**
Estimated Water Recharge Rate (Acre-ft per Year)	**46.15**	**46.15**	**46.15**

The proposed modifications for the Diamond Creek Vineyards project will result in a decrease in the use of groundwater by 0.46 af/yr for a total usage of 11.46 af/yr which is less than the estimated groundwater recharge rate for the parcel of 46.15 af/yr. The increase in production and visitation is mitigated by the use of the treated process wastewater for vineyard irrigation and revisions to the vineyard irrigation program to utilize dry farming techniques. An irrigation water balance can be found in Appendix 2 which details the beneficial reuse of treated process wastewater at the site. The water demand calculations associated with the five (5) year period for dry farming establishment, and the water demand to each well are contained in Appendix 3. Due to the timeline of improvements and in order to be conservative, the vineyard irrigation water demand from 2025 has been used for the groundwater use calculation.

GROUNDWATER RECHARGE

The total groundwater usage will be below the estimated ground water recharge rate for the site. A lot line adjustment is proposed to expand the winery parcel to include the new winery building location, and this expanded area has been considered for the Groundwater Recharge Rate calculation and the Water Availability Analysis for the parcel. The proposed parcel size will be 73.26± acres. A groundwater recharge rate was calculated for the site and found to be 0.63 ac-ft/ac/yr. This calculation can be found in Appendix 4. This provides an annual allowable water allotment of 46.15 ac-ft/yr for the 73.26-acre parcel.

VINEYARD IRRIGATION

Diamond Creek Vineyards is proposing to revise their vineyard irrigation to reduce water usage and utilize treated process wastewater for vineyard irrigation. Diamond Creek Vineyards has also identified four (4) vineyard blocks which total 3.1 acres which are suitable for dry farming. The blocks identified for dry farming will be irrigated after their initial replant. Irrigation will be tapered off over a period of five (5) years until dry farming is achieved. In addition to dry farming, the winemaker has evaluated three (3) sub-blocks north of Diamond Creek which are suitable for a 20% reduction in vineyard irrigation.

Vineyard irrigation water usage during the establishment of dry farming is shown with a yearly breakdown for each well in Appendix 3. Due to the timeline of the site improvements, water usage from 2025 is shown as part of the Groundwater Use Calculation on page 5. This calculation serves as a conservative estimate for the groundwater usage at the site.

The conservative estimate for proposed reduction in vineyard irrigation used for the Groundwater use calculation is 1.09 ac-ft/yr. After the full establishment of dry farming in 2029, the proposed program is anticipated to result in a total reduction to vineyard irrigation of approximately 1.8 ac-ft/yr, an additional reduction of 0.71 ac-ft/yr.

WATER SAVING PRACTICES

Diamond Creek is proposing winery operations that will ensure water usage is consistent with or better than the industry standard for process water. The process water demand per the Napa County WAA guidance document assigns a standard usage total of 2.15 acre-feet per 100,000 gallons of wine, which equates to seven (7) gallons of process wastewater per gallon of wine. The totals associated with this demand have been denoted in this report as the “Proposed Standard Usage”.

Water conservation measures to reduce water usage throughout the facility will include water efficient models for pressure and barrel washers, and trigger controls for hoses. In addition, floor cleaning will be performed as needed with squeegees and push brooms in place of using hoses. These practices allow adoption of six (6) gallons of process wastewater per gallon of wine. This process water demand has been denoted as the “Proposed Reduced” usage in this report.

This process water usage is consistent with the range associated with the industry standard. A usage of five (5) gallons of process wastewater per gallon of wine was used in a 2019 presentation by The Waterboard in discussions of the Winery General Order in regards to Tier determination[1]. Process wastewater generation of less than five (5) gallons of water per gallon of wine has been achieved at

[1] https://www.waterboards.ca.gov/water_issues/programs/waste_discharge_requirements/docs/outreach_lodi_ppt.pdf (Slide 10)

other wineries including Rombauer[2]. With the increase in water saving practices and available technologies, the proposed generation of six (6) gallons of process wastewater per gallon of wine can be achieved.

WELL LOCATION AND CONSTRUCTION

Well #1

Well #1 is currently used for the winery process and domestic water supply as well as irrigation for the vineyard blocks south of Diamond Mountain Creek. This well also provides water to the existing residence located on the adjacent parcel 020-400-012. This project well is located upslope of Diamond Mountain Creek near the edge of the existing driveway; 380 feet northeast of the existing winery building. It is located approximately 441 feet from Diamond Mountain Creek. Well locations are shown on the Tier III Significant streams Exhibit in Appendix 1.

The well completion report shows that the well is 360 feet deep, with a grouted seal to 50 feet, first perforations occurring at 130 feet, and has a yield of approximately 320 gpm. Well #1 is located at an elevation of 601 feet based on topographic survey information, placing the first perforations for the well at an approximate elevation of 471 feet and the bottom of the well at approximate elevation 241 feet. The elevations of the creek based on an aerial survey from 2004 shows an approximate elevation at the well location of 519 feet. This would indicate an estimated separation of roughly 48 feet between the creek bottom and the level of the first perforations. A copy of the well completion report, and a well pumping report are contained in Appendix 5.

In order to reduce potential impacts to nearby surface waters, the project is proposing to reduce pumping time on Well #1, without increasing the pumping rate (gpm), thereby reducing pumping volumes from this well. This reduction in pumping volume can be achieved due to the proposed reduction in vineyard irrigation demand long term.

Based on the existing and proposed demand for Well #1 shown in Appendix 3, and the current well yield shown in Appendix 5, a conservative estimate is a 3% reduction in pumping time by 2025 (2.3 hours/yr - 89.4 hrs/yr to 87.1 hrs/yr). The proposed reduction after the full implementation of dry-farming in 2029 is a 11% reduction in pumping time (9.6 hours/yr - 89.4 hrs/yr to 79.8 hrs/yr).

Total Existing Well #1 Pumping Time

(Well #1 – Existing Demand, Per Well Specific Water Demands shown in Appendix 3)

$$= 5.27\frac{ac-ft}{yr}\ x\ \frac{325{,}851\ gal}{1\ ac-ft}\ x\ \frac{1\ min}{320\ gal}\ (Pumping\ Yield) x\ \frac{1\ hr}{60\ min} = 89.4\ hrs/yr$$

Total Proposed Well #1 Pumping Time - (2025)

(Well #1 – Proposed Demand, Per Well Specific Water Demands shown in Appendix 3)

$$=\ 5.13\frac{ac-ft}{yr}\ x\ \frac{325{,}851\ gal}{1\ ac-ft}\ x\ \frac{1\ min}{320\ gal}\ (Pumping\ Yield) x\ \frac{1\ hr}{60\ min} = 87.1\ hrs/yr$$

[2] https://www.northbaybusinessjournal.com/article/industrynews/napa-valley-winery-taps-water-wise-past-lessons-for-drought-of-2021/

Total Proposed Well #1 Pumping Time - (2029)

(Well #1 – Proposed Demand, Per Well Specific Water Demands shown in Appendix 3)

$$= 4.70\frac{ac-ft}{yr}\ x\ \frac{325{,}851\ gal}{1\ ac-ft}\ x\ \frac{1\ min}{320\ gal}(Pumping\ Yield)x\ \frac{1\ hr}{60\ min} = 79.8\ hrs/yr$$

By reducing the pumping time and the total pumping volume at Well #1, it is our opinion that the proposed project will result in a reduction to potential impacts to the stream from this existing well.

Well #2

Well #2 is used for the vineyard irrigation for all blocks north of Diamond Mountain Creek. This well is located 21 feet north of Diamond Mountain Creek. Per a recent well inspection completed by Dr. Well, Water Well Services on April 2, 2024, this well was found to be 138 feet deep with first perforations occurring at 23 feet. The well yield report for this well shows a yield of 160 gallons per minute. Copies of these reports are contained in Appendix 5. Based on an aerial survey from 2004, Well #2 shows an approximate elevation of 536 feet, placing the first perforations for the well at approximate elevation 513 feet and the bottom of the well at approximate elevation 398 feet. The elevations of the creek based the aerial survey shows an approximate elevation of 532 feet. This would indicate an estimated separation of roughly 19 feet between the creek bottom and the level of the first perforations. A copy of the well completion report, and a well pumping report are contained in Appendix 5.

Diamond Creek Vineyards is proposing under separate permit to abandon this well and transfer the vineyard irrigation to a new replacement well (Well #3).

In order to reduce potential impacts to nearby surface waters, the project is proposing to reduce pumping time on Well #2, without increasing the pumping rate (gpm), thereby reducing pumping volumes from this well. This reduction in pumping volume can be achieved due to the proposed reduction in vineyard irrigation demand long term.

Based on the existing and proposed demand for Well #2 shown in Appendix 3, and the current well yield for Well #2 shown in Appendix 5, a conservative estimate is a 5% reduction in pumping time by 2025 (10.8 hours/yr - 225.7 hrs/yr to 214.9 hrs/yr). The proposed reduction after the full implementation of dry-farming in 2029 is a 9% reduction in pumping time (20.3 hrs/yr - 225.7 hrs/yr to 205.4 hrs/yr).

Total Existing Well #2 Pumping Time

(Well #2 – Existing Demand, Per Well Specific Water Demands shown in Appendix 3)

$$= 6.65\frac{ac-ft}{yr}\ x\ \frac{325{,}851\ gal}{1\ ac-ft}\ x\ \frac{1\ min}{160\ gal}(Pumping\ Yield)x\ \frac{1\ hr}{60\ min} = 225.7\ hrs/yr$$

Total Proposed Well #2 Pumping Time - 2025

(Well #2 – Proposed Demand, Per Well Specific Water Demands shown in Appendix 3)

$$= 6.33\frac{ac-ft}{yr}\ x\ \frac{325{,}851\ gal}{1\ ac-ft}\ x\ \frac{1\ min}{160\ gal}(Pumping\ Yield)x\ \frac{1\ hr}{60\ min} = 214.9\ hrs/yr$$

Total Proposed Well #2 Pumping Time - 2029

(Well #2 – Proposed Demand, Per Well Specific Water Demands shown in Appendix 3)

$$= 6.05\frac{ac-ft}{yr}\ x\ \frac{325{,}851\ gal}{1\ ac-ft}\ x\ \frac{1\ min}{160\ gal}\ (Pumping\ Yield) x\ \frac{1\ hr}{60\ min} = 205.4\ hrs/yr$$

By reducing the pumping time and the total pumping volume at Well #2, it is our opinion that the proposed project will result in a reduction to potential impacts to the stream from this existing well.

TIER II ANALYSIS – WELL PROXIMITY TO NEIGHBORING WELLS

The only well onsite that is within 500 feet of a neighboring well is the existing project well identified as Well #1. See the Tier II & III Well and Significant Streams Exhibit in Appendix 1. Per Napa County Well Permit Standards and WAA Requirements Table dated January 2024, Footnote 8, the Tier II analysis is only required if there is an increase in groundwater use at the site. Since (a) the project will reduce overall groundwater usage and (b) more particularly, demand on Well #1 will be less as part of the overall reduction in use, a Tier II analysis is not required.

TIER III ANALYSIS – WELL PROXIMITY TO SIGNIFICANT STREAMS

There are two existing wells on the winery parcel, but a replacement well (Well #3) is proposed under separate permit. The project well (Well #1) is used for the winery and domestic water supply as well as vineyard irrigation, and the other existing well (Well #2) is used for vineyard irrigation. RSA+ has determined that the wells on site are within 1,500 feet of Diamond Mountain Creek, a significant stream. See the Tier III Significant Streams Exhibit in Appendix 1.

Assuming connectivity to the significant stream, the project proposes to modify the operation of the existing wells by:

1. Reducing overall volume of groundwater usage on Well #1 by 0.14 ac-ft/yr initially and reducing further to 0.57 ac-ft/yr by utilizing dry farming of 2.4 acres of vineyard, and beneficial reuse of 0.46 ac-ft/yr of treated process wastewater.
2. Reducing overall volume of groundwater usage on Well #2 by 0.32 ac-ft/yr initially and reducing further to 0.6 ac-ft/yr by utilizing dry farming of 0.7 acres of vineyard, and by reducing irrigation to a portion of the largest vineyard block served by this well by 20%.
3. Reducing annual water demand for Well #1 by approximately 3% by 2025, with further reduction to 11% after the establishment of dry farming in 2029, and reducing water demand on the other onsite well by approximately 5% by 2025, with further reduction to 9% after the establishment of dry farming in 2029.
4. A modification to the well operation is proposed for all existing wells. This will be achieved by limiting well operations for each well to their current pumping rates, as stated in this report, while reducing the pumping times for all wells.
    a. There will be an initial reduction in pumping time of 2.3 hours per year at Well #1 representing a 3% decrease. There will be further reduction to 9.6 hours per year, representing an 11% reduction, after the full implementation of the proposed dry farming.

b. There will be an initial reduction in pumping time of 10.8 hours per year from Well #2 representing a 5% decrease. There will be further reduction to 20.3 hours per year, representing an 9% reduction, after the full implementation of the proposed dry farming.

The proposed modifications will reduce the volume of groundwater pumped and pumping times for each well. This will result in a reduction of the daily pumping rates of each well, thereby allowing greater time for aquifer recharge and therefore a reduction of impact on the stream.

The proposed modifications will reduce impacts relative to existing conditions and thereby meet the requirements of The County of Napa's January 10, 2024 Tier III Water Availability Analysis guidance memorandum. If either well is replaced, the replacement well will be subject to the same limitations on their operation.

DETAILED GROUNDWATER USE CALCULATIONS

Detailed below and on the following pages are summaries of the existing and proposed water use and detailed calculations of water usage. Calculations of specific water usage for each well can be found in Appendix 3.

Existing Water Demand

Existing Vineyard Irrigation and Landscaping Water Demand

Vineyard – Irrigation from well – (0.5 af/ac-yr x	21.5	acres vineyard) =	10.75	af/yr
Vineyard – Irrigation from PWW Credit	0	acres vineyard) =	0.00	af/yr
Landscape – (0.5 af / 100,000-gallon wine x	10,000	gal wine/year) =	0.05	af/yr

Existing Winery Process Water Demand

Process Water – (2.15 af / 100,000-gallon wine x	10,000	gal wine/year) =	0.22	af/yr

Existing Residential Water Demand

Residence on Adj. Parcel Domestic Water – (Main Dwelling – 0.75 af/yr x	1	dwelling) =	0.75	af/yr
Winery Parcel Domestic Water – (Main Dwelling – 0.75 af/yr x	0	dwelling) =	0.00	af/yr

Existing Winery Domestic Water Demand

FT Employees – (15 gal/person/day x 313 days/yr x	6	employees/day) =	0.086	af/yr
PT Employees – (15 gal/person/day x 165 days/yr x	2	employees/day) =	0.015	af/yr
Average Visitors – (3 gal/person/day x 52 wks/yr	47	visitors/wk) =	0.023	af/yr
Marketing Events – (100 visitors @ 15 gal/guest x	5	days/yr) =	0.023	af/yr
		Total =	0.147	af/yr
		Total =	0.15	af/yr
Total Existing Water Demand		**Total =**	**11.92**	**af/yr**

Proposed Water Demand

			Proposed Standard		Proposed Reduced	
Proposed Vineyard Irrigation and Landscaping Water Demand						
Vineyard – Irrigation from Well –		(See Appendix 3)	9.66	af/yr	9.66	af/yr
Vineyard – Irrigation from PWW Credit –		(See Appendix 2)	-0.46	af/yr	-0.46	af/yr
Landscape – (0.5 af / 100,000-gallon wine x	25,000	gal wine/year) =	0.13	af/yr	0.13	af/yr
Proposed Winery Process Water Demand						
[1][2] Process Water – (2.15 af / 100,000-gallon wine x	25,000	gal wine/year) =	0.54	af/yr	0.46	af/y
Proposed Residential Water Demand						
Residence on Adj. Parcel Domestic Water – (Main Dwelling – 0.75 af/yr x	1	dwelling) =	0.75	af/yr	0.75	af/yr
Winery Parcel Domestic Water – (Main Dwelling – 0.75 af/yr x	1	dwelling) =	0.75	af/yr	0.75	af/yr
Proposed Winery Domestic Water Demand						
FT Employees – (15 gal/person/day x 313 days/yr x	8	employees/day) =	0.115	af/yr	0.115	af/yr
PT Employees – (15 gal/person/day x 165 days/yr x	2	employees/day) =	0.015	af/yr	0.015	af/yr
[3] Average Visitors – (3 gal/person/day x 52 wks/yr	60	visitors/wk) =	0.029	af/yr	0.029	af/yr
[4] Marketing Events – (100 visitors @ 15 gal/guest x	1	days/yr) =	0.005	af/yr	0.005	af/yr
[4] Marketing Events – (50 visitors @ 15 gal/guest x	1	days/yr) =	0.002	af/yr	0.002	af/yr
		Total =	0.166	af/yr	0.166	af/yr
		Total =	0.170	af/yr	0.170	af/yr
Total Proposed Water Demand		**Total =**	**11.54**	**af/yr**	**11.46**	**af/yr**

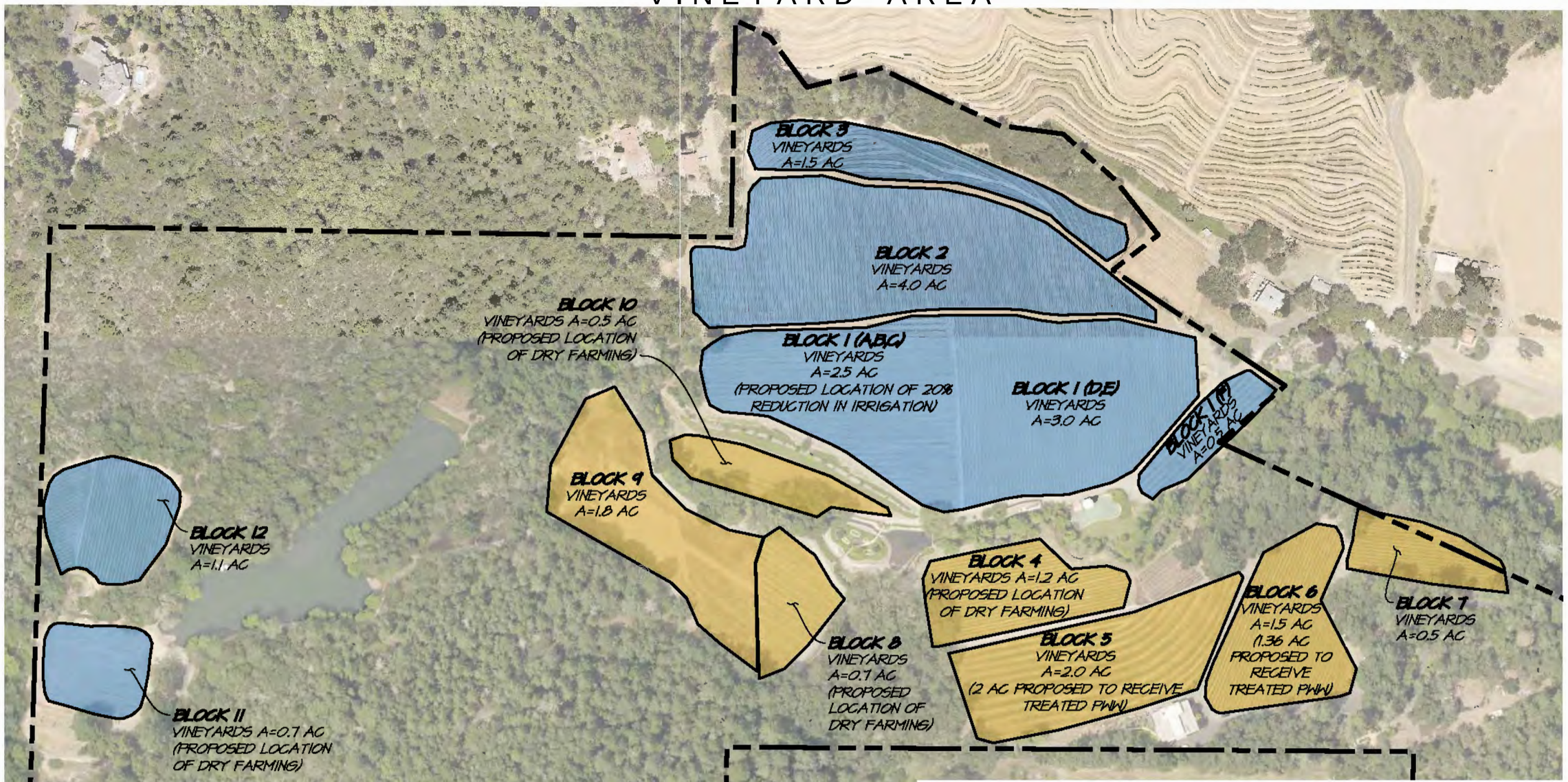
Estimates per Napa County Water Availability Analysis – Guidance Document, May 12, 2015 unless noted:

[1] 2.15 ac-ft per 100,000 gallons wine per Napa County WAA – Guidance Document
[2] Reduced water use to six (6) gallons per gallon of wine or 1.84 ac-ft per 100,000 gallons wine (14% reduction)
[3] 3 gallons of water per guest per Napa County WAA – Guidance Document
[4] 15 gallons of water per guest per Napa County WAA – Guidance Document

Appendix 1

Vineyard Area Exhibit
Tier II & III Well and Significant Streams Exhibit

DIAMOND CREEK VINEYARDS
VINEYARD AREA



TOTAL PARCEL AREA = 73.26+/- ACRES
TOTAL VINEYARD AREA = 21.5 ACRES

BLOCKS IRRIGATED BY WELL #1

BLOCKS IRRIGATED BY WELL #2

GRAPHIC SCALE

200' 0 200'

(IN FEET)
1 INCH = 200 FT

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May 21, 2025 4120020.0 Exh - Vineyard Area.dwg

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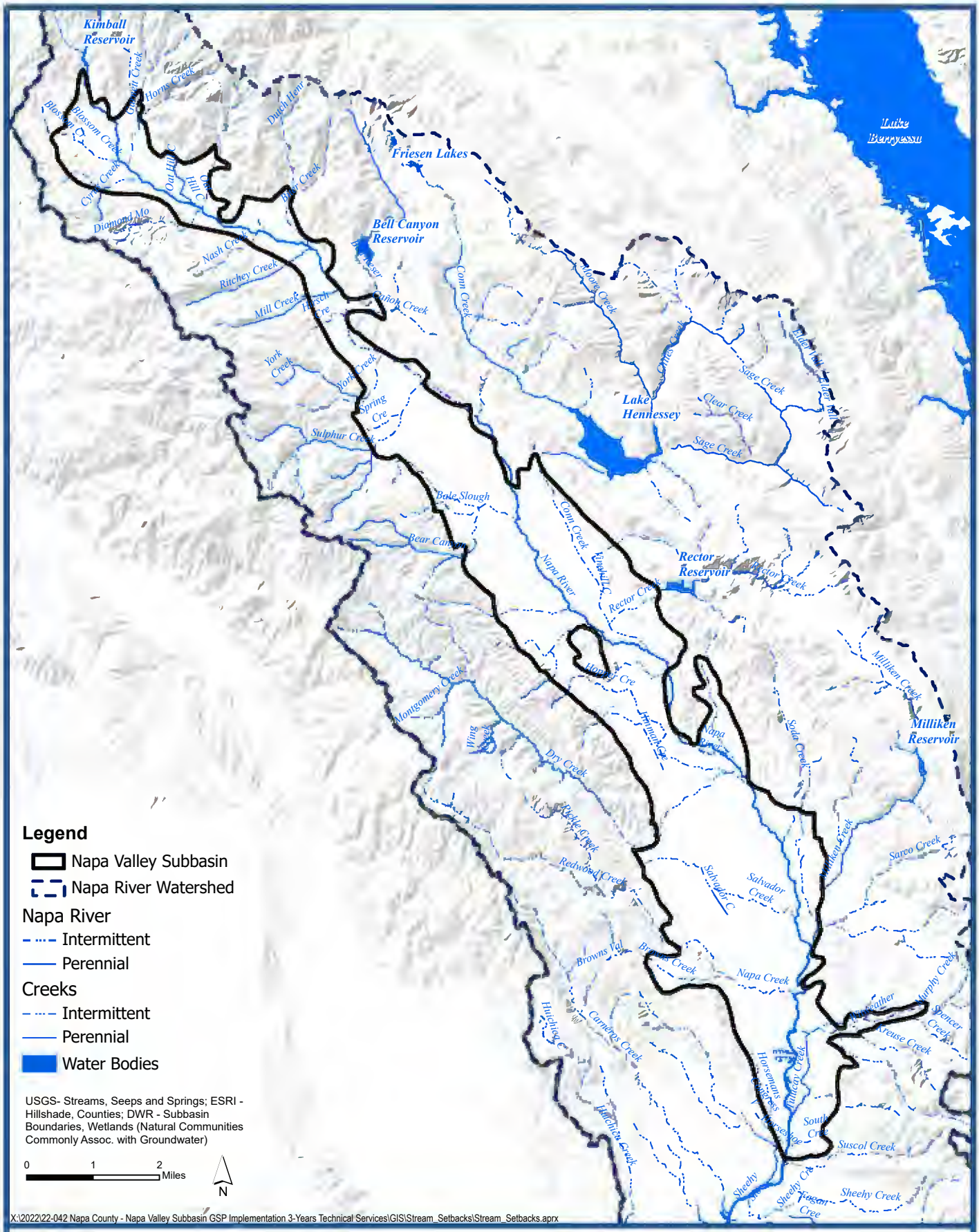


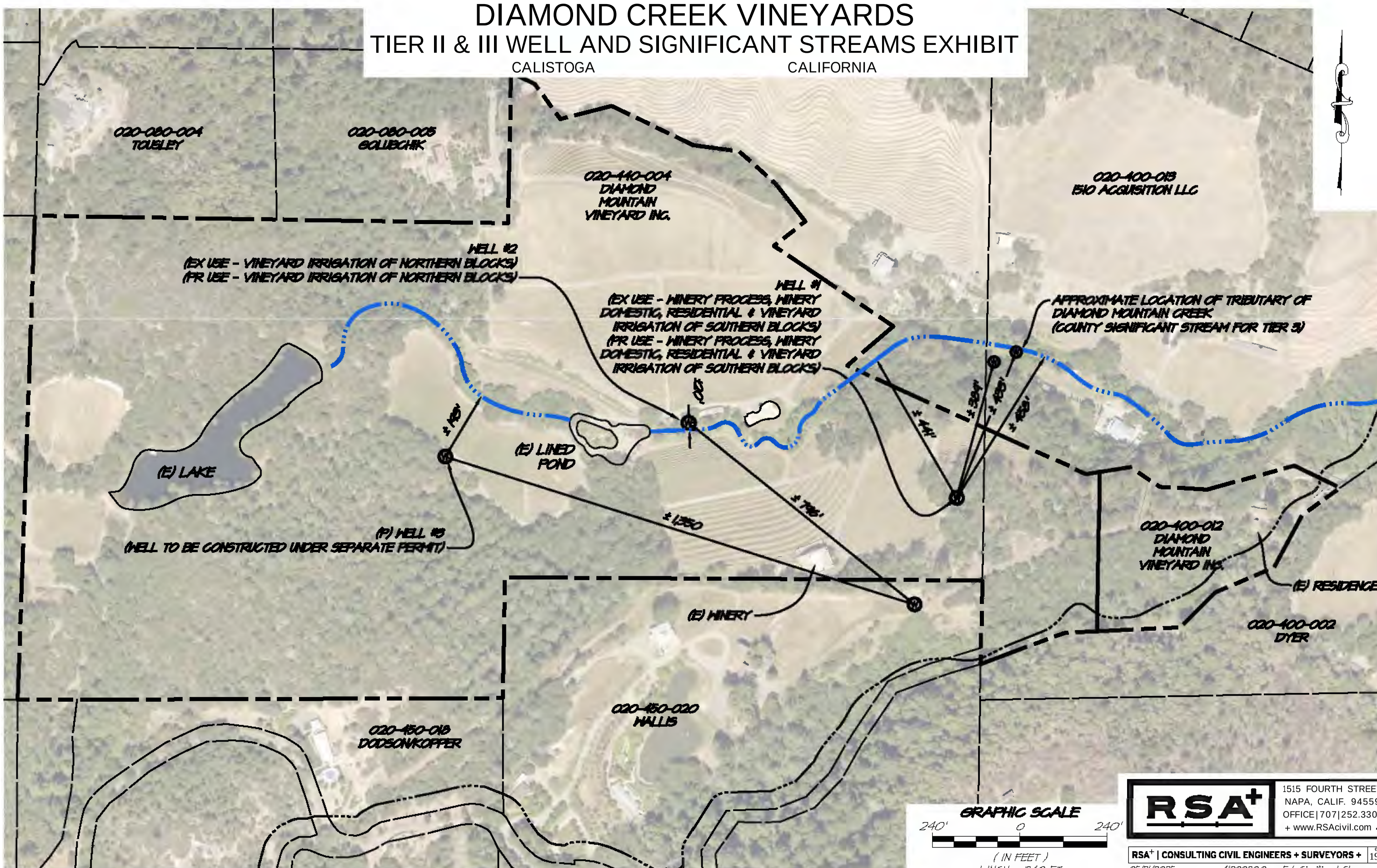
Luhdorff & Scalmanini
Consulting Engineers

Napa County Well Permit Standards: Significant Streams

Napa County Well Permit Standards
Napa County, California

Figure 1

DIAMOND CREEK VINEYARDS
TIER II & III WELL AND SIGNIFICANT STREAMS EXHIBIT
CALISTOGA CALIFORNIA



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05/21/2025 4120020.0 Exh-Significant Streams.dwg

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Appendix 2

Irrigation Water Balance

Reclaimed Process Wastewater
Water Balance for Irrigation and Storage

Project Description		Annual Process Waste Flow Volume		
Project Number:	4120020.0	Wine Production:	25,000	gal/year
Project Name:	Diamond Creek Vineyards			
Prepared By:	AM/BTF	Annual Process Waste per Gallon Wine:	6	gal/year
Date:	January 30th, 2025	Total Annual Process Waste Generated:	150,000	gal/year

Vineyard Irrigation Parameters		Landscape Irrigation Parameters		
Acres of irrigated vineyard:	3.36 acres	Crop type / name:	Cover Crop	
Row spacing:	7.0 feet	Total irrigated acres of crop:	0.00 acres	
Vine spacing:	8.0 feet			
Total number of vines:	2,614 vines			
Water use per vine per month (peak):	26 gal			
Total peak monthly irrigation demand:	67,954 gal			

Monthly Process Wastewater Generation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly process wastewater generated as % of annual total:	4%	6%	6%	5%	6%	7%	9%	10%	15%	13%	11%	8%
Monthly process wastewater generated [gallons]:	6,000	9,000	9,000	7,500	9,000	10,500	13,500	15,000	22,500	19,500	16,500	12,000

Monthly Vineyard Irrigation Water Use

(Based on per-vine water use)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beginning of month reclaimed water in storage [gallons] (This number brought forward from end of previous month)	14,909	16,832	21,755	23,959	0	0	0	0	0	0	0	9,705
Vineyard irrigation as % of peak month irrigation demand:	6%	6%	10%	100%	100%	100%	100%	100%	100%	100%	10%	10%
Irrigation per month per vine (gallons):	1.6	1.6	2.6	26.0	26.0	26.0	26.0	26.0	26.0	26.0	2.6	2.6
Total vineyard irrigation demand [gallons]:	4,077	4,077	6,795	67,954	67,954	67,954	67,954	67,954	67,954	67,954	6,795	6,795
Will vineyard be irrigated with reclaimed water this month?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Process wastewater generated this month, reclaimed for vineyard irrigation [gallons]	4,077	4,077	6,795	7,500	9,000	10,500	13,500	15,000	22,500	19,500	6,795	6,795
Remaining vineyard irrigation demand after using this month's process water [gallons]	0	0	0	60,454	58,954	57,454	54,454	52,954	45,454	48,454	0	0
Drawdown from storage for remaining vineyard irrigation [gallons]	0	0	0	23,959	0	0	0	0	0	0	0	0
Well water required to satisfy remaining vineyard irrigation demand	0	0	0	36,494	58,954	57,454	54,454	52,954	45,454	48,454	0	0
Net storage after vineyard irrigation drawdown [gallons]	14,909	16,832	21,755	0	0	0	0	0	0	0	0	9,705
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons]	1,923	4,923	2,205	0	0	0	0	0	0	0	9,705	5,205

Water balance continues on next page for cover crop irrigation.

Monthly Landscape Irrigation Water Use

(Based on evapotranspiration crop demand and irrigated area)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons] *(From sheet 1)*	1,923	4,923	2,205	0	0	0	0	0	0	0	9,705	5,205
Reference ET (ETo) (in/month) (see note 1)	1.32	1.8	3.32	4.78	6.11	6.84	7.07	6.3	4.9	3.45	1.74	1.29
Crop Coefficient (k_c) (see note 2)	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Crop water demand per acre [inches]	0.79	1.08	1.99	2.87	3.67	4.10	4.24	3.78	2.94	2.07	1.04	0.77
Crop water demand per acre [gallons]	21,505	29,325	54,088	77,873	99,541	111,433	115,180	102,636	79,828	56,205	28,347	21,016
Total crop water demand for irrigated area [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Will landscape be irrigated with reclaimed water this month?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Process wastewater remaining after vineyard irrigation, reclaimed for landscape irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Landscape irrigation water required from storage or other source [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Drawdown from storage for landscape irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Process wastewater generated this month, unused for irrigation, to be reclaimed and stored [gallons]	1,923	4,923	2,205	0	0	0	0	0	0	0	9,705	5,205
Net end-of-month reclaimed water storage after all irrigation [gallons]	16,832	21,755	23,959	0	0	0	0	0	0	0	9,705	14,909

End of Water Balance

Total PWW used for irrigation
126,039 gal
=0.39 ac-ft
+
23,959 gal
=0.07 ac-ft
Tot = 149,998 gal
= 0.46 ac-ft

Peak Monthly Storage = 23,959 gallons

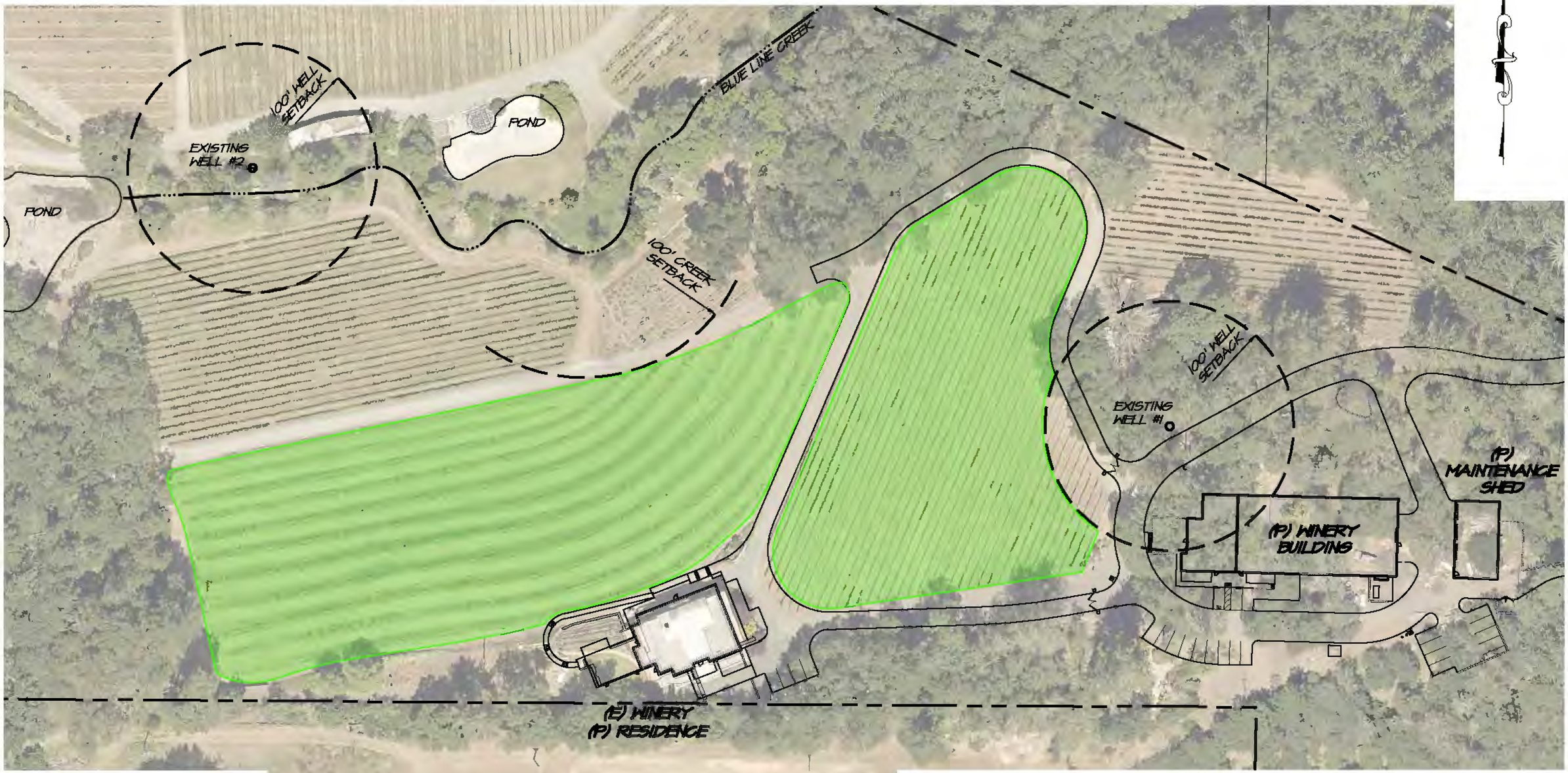
Notes:

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

DIAMOND CREEK VINEYARDS

PROCESS WASTEWATER IRRIGATION EXHIBIT

NAPA COUNTY CALIFORNIA



GRAPHIC SCALE

80' 0 80'

(IN FEET)

1 INCH = 80 FT

LEGEND

VINEYARD AREA TO BE IRRIGATED BY TREATED PROCESS WASTEWATER = ±3.36 ACRES

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Appendix 3

Irrigation Water Demand by Well &
Yearly Water Demands for Dry Farming Establishment

DIAMOND CREEK VINEYARDS

WELL SPECIFIC WATER DEMANDS

Existing Well #1 Water Demand		
Winery Domestic	0.15	af/yr
Winery Process	0.22	af/yr
Vineyard Irrigation	4.10	af/yr
Landscape	0.05	af/yr
Existing Residence Adjacent Property	0.75	af/yr
Total Well #1	**5.27**	af/yr
NOTES: Vineyard Irrigation for is for 8.2 AC South of Diamond Creek		

Proposed Well #1 Water Demand (2025)		
Winery Domestic	0.17	af/yr
Winery Process	0.46	af/yr
Vineyard Irrigation	3.33	af/yr
Vineyard Irrigation Credit from PWW	-0.46	af/yr
Landscape	0.13	af/yr
Existing Residence Adjacent Property	0.75	af/yr
Future Residence	0.75	af/yr
Total Well #1	**5.13**	af/yr
NOTES: Vineyard Irrigation based on the establishment of Dry Farming in 2025 (See Attached calculation)		

Proposed Well #1 Water Demand (2029)		
Winery Domestic	0.17	af/yr
Winery Process	0.46	af/yr
Vineyard Irrigation	2.90	af/yr
Vineyard Irrigation Credit from PWW	-0.46	af/yr
Landscape	0.13	af/yr
Existing Residence Adjacent Property	0.75	af/yr
Future Residence	0.75	af/yr
Total Well #1	**4.70**	af/yr
NOTES: Vineyard Irrigation based on the full establishment of Dry Farming in 2029 (See Attached calculation)		

Existing Well #2 Water Demand		
Winery Domestic	0.00	af/yr
Winery Process	0.00	af/yr
Vineyard Irrigation	6.65	af/yr
Total Well #2	**6.65**	af/yr

NOTES: Vineyard Irrigation is for 13.3 AC North of Diamond Creek

Proposed Well #2 Water Demand (2025)		
Winery Domestic	0.00	af/yr
Winery Process	0.00	af/yr
Vineyard Irrigation	6.33	af/yr
Total Well #2	**6.33**	af/yr

NOTES: Vineyard Irrigation accounts for 20% reduction for a portion of Block 1 (Block 1 a,b,c), and dry farming establishment of Block 11.

Proposed Well #2 Water Demand (2029)		
Winery Domestic	0.00	af/yr
Winery Process	0.00	af/yr
Vineyard Irrigation	6.05	af/yr
Total Well #2	**6.05**	af/yr

NOTES: Vineyard Irrigation accounts for 20% reduction for a portion of Block 1 (Block 1 a,b,c), and dry farming fully established at Block 11.

VINEYARD IRRIGATION WATER DEMAND FOR EACH WELL

DIAMOND CREEK VINEYARDS

ANNUAL WATER DEMANDS FOR DRY-FARMING ESTABLISHMENT OF SOUTHERN BLOCKS (WELL #1)

Blocks	Acres	Allotment by year (Dry Farm Establishment over 5 years) [ac-ft/ac]						Irrigation Totals for Southern Vineyard Blocks[ac-ft]						NOTES
		2024	2025	2026	2027	2028	2029	2024	2025	2026	2027	2028	2029	
4	1.2	0	0	0	0	0	0	0	0	0	0	0	0	Replanted in 1998, eligible to be entirely dry-farmed currently
5	2	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	This block may not be dry farmed
6	1.5	0.5	0.5	0.5	0.5	0.5	0.5	0.75	0.75	0.75	0.75	0.75	0.75	Block to receive treated PWW
7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.25	0.25	0.25	0.25	0.25	0.25	Block to receive treated PWW
8	0.7	0.5	0.4	0.3	0.2	0.1	0	0.35	0.28	0.21	0.14	0.07	0.00	This block was replanted in 2024 & will be entirely dry-farmed by 2029
9	1.8	0.5	0.5	0.5	0.5	0.5	0.5	0.9	0.9	0.9	0.9	0.9	0.9	This block may not be dry farmed
10	0.5	0.4	0.3	0.2	0.1	0	0	0.2	0.15	0.1	0.05	0	0	This block was replanted in 2023 & will be entirely dry-farmed by 2028
Irrigation Total (By Year)								**3.45**	**3.33**	**3.21**	**3.09**	**2.97**	**2.9**	**Demand for 2025 used for groundwater calculation due to timing of improvements**

DIAMOND CREEK VINEYARDS

ANNUAL WATER DEMANDS FOR NORTHERN BLOCKS INCLUDING DRY-FARMING ESTABLISHMENT (WELL #2)

Blocks	Acres	Irrigation Allotment [ac-ft/ac]		Allotment by year (Dry Farm Establishment over 5 years) [ac-ft/ac]						Irrigation Totals for Southern Vineyard Blocks[ac-ft]						NOTES
		Existing	Proposed	2024	2025	2026	2027	2028	2029	2024	2025	2026	2027	2028	2029	
1 (a,b,c)	2.5	0.5	0.4	N/A	N/A	N/A	N/A	N/A	N/A	1.25	1	1	1	1	1	Portion of Block 1 identified for a 20% reduction in irrigation
1 (d,e, f)	3.5	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	1.75	1.75	1.75	1.75	1.75	1.75	No change to irrigation schedule
2	4	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	2	2	2	2	2	2	No change to irrigation schedule
3	1.5	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	0.75	0.75	0.75	0.75	0.75	0.75	No change to irrigation schedule
11	0.7	0.5	See Dry Farming Establishment	0.5	0.4	0.3	0.2	0.1	0	0.35	0.28	0.21	0.14	0.07	0.00	This block was replanted in 2024 & will be entirely dry-farmed by 2029
12	1.1	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	0.55	0.55	0.55	0.55	0.55	0.55	No change to irrigation schedule
Irrigation Total (By Year)										**6.65**	**6.33**	**6.26**	**6.19**	**6.12**	**6.05**	**Demand for 2025 used for groundwater calculation due to timing of improvements**

Appendix 4

Annual Groundwater Recharge Rate

ANNUAL GROUNDWATER RECHARGE RATE

For

DIAMOND CREEK VINEYARDS
1500 DIAMOND MOUTAIN ROAD
CALISTOGA, CA 94515

APN 020-440-004 & 020-400-012

PREPARED FOR:
Diamond Mountain Vineyard Company, Inc.
Attn: Nicole Carter
1500 Diamond Mountain Road
Calistoga, CA 94515

January 23, 2025
Project # 4120020.0

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

INTRODUCTION

This report determines the annual groundwater recharge rate for the Diamond Creek Vineyards properties. The existing winery is located on APN 020-440-004 and the driveway is located on APN 020-400-012. A lot line adjustment is proposed to expand the winery parcel to include the new winery building location, and this expanded area has been considered in this calculation. The proposed parcel will have an area of 73.26 ± acres. The parcel has slopes ranging from 5-30%.

For the analysis, the parcel has been divided into four (4) areas, impervious, vineyard, grassland, and coastal oak tree areas.

METHODOLOGY

The groundwater recharge rate has been determined by examining the annual rainfall, runoff and species-specific evapotranspiration during winter months. Napa County's new 10-year PRISM data was used to determine the annual rainfall amount and site runoff volumes. It was determined that the average annual rainfall amounts to 32.52 inches per year.

The runoff volumes were determined by calculating the site-specific runoff coefficient. The runoff coefficients were calculated using aerial images to view the terrain and the county topography to estimate the slopes in each area.

The evapotranspiration losses were calculated using the Water Use Classifications of Landscape Species (WUCOLS) methodology for the vineyard, grassland, and coastal oak tree areas. Only evapotranspiration from the winter was considered, as it is assumed that evapotranspiration in summer will be from irrigation water.

The groundwater recharge rate was calculated as the difference of the total annual rainfall and losses from the stormwater runoff and evapotranspiration. Refer to attached calculations.

Average Recharge Rate = Average Rainfall - Runoff – Evapotranspiration

CONCLUSION

The Diamond Creek Vineyards property has an annual rainfall of 32.52 inches per year, equating to 198.54 acre-feet per year for the parcels.

Total evapotranspiration volume that occurs through the vineyard, grassland, and oak tree areas is 21.85 acre-feet per year. The stormwater runoff from the parcels totals 130.60 acre-feet per year. The total average evapotranspiration and runoff is 152.45 acre-feet per year. This equates to a groundwater recharge rate of 46.15 acre-feet per year, or 0.63 acre-feet per acre per year.

Diamond Creek Vineyards
Groundwater Recharge Rate

Parcels 020-440-004 & 020-400-012

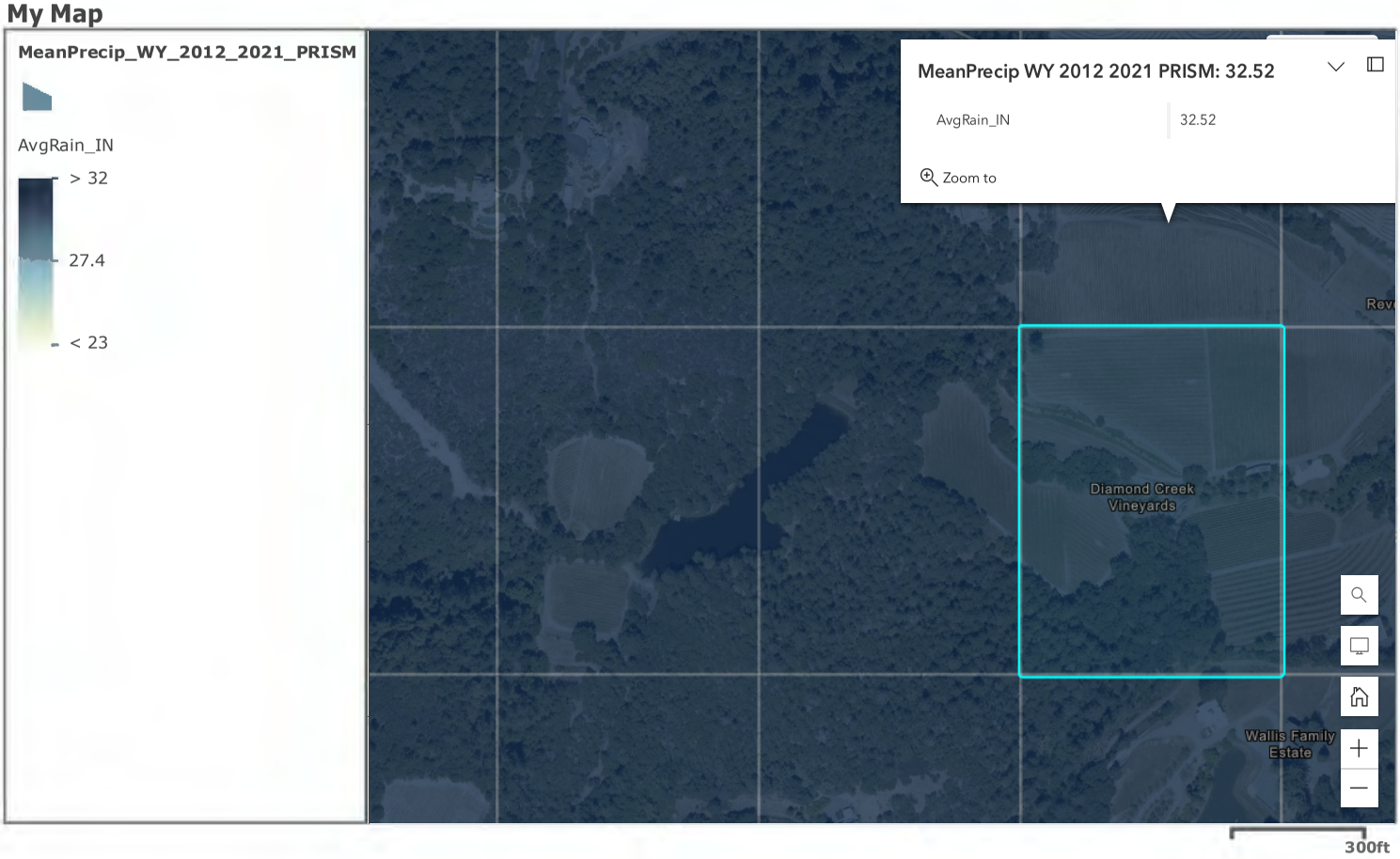
Site Description	Hydrologic Soil Group	Area (ft^2)	Area (ac)	Total Annual Rainfall (in/yr)	Total Rainfall (ft^3/yr)
Impervious Area	B	181,684	4.17	32.52	492,364
Vineyard Area	B	1,052,436	24.16	32.52	2,852,102
Grass and Shrubs	B	83,207	1.91	32.52	225,491
Coastal Oak Trees	B	1,874,002	43.02	32.52	5,078,545
Total			**73.26**	**32.52**	**8,648,502**

Evapotranspiration (ET_0)										
Site	January (Et_o) (in)	February (Et_o) (in)	March (Et_o) (in)	October (Et_o) (in)	November (Et_o) (in)	December (Et_o) (in)	Total ET_o (in)	Landscape Coefficient (k_c)	Landscape Evapotrans. (Et_c) (in) = Total Et_o x k_c	Total Landscape Evapotranspiration (ft^3/yr)
Impervious Area	0	0	0	0	0	0	0	0	0.00	0
Vineyard Area	1.03	1.53	2.93	3.53	1.64	1.17	11.83	0.08	0.95	83,002
Grass and Shrubs	1.03	1.53	2.93	3.53	1.64	1.17	11.83	0.68	8.04	55,779
Coastal Oak Trees	1.03	1.53	2.93	3.53	1.64	1.17	11.83	0.44	5.21	812,880
Total										**951,661**

Runoff		
Site	Run-Off Coefficient (C)	Total Runoff (ft^3/yr)
Impervious Area	0.90	443,127
Vineyard Area	0.60	1,711,261
Grass and Shrubs	0.36	81,177
Coastal Oak Trees	0.68	3,453,411
Total		**5,688,976**

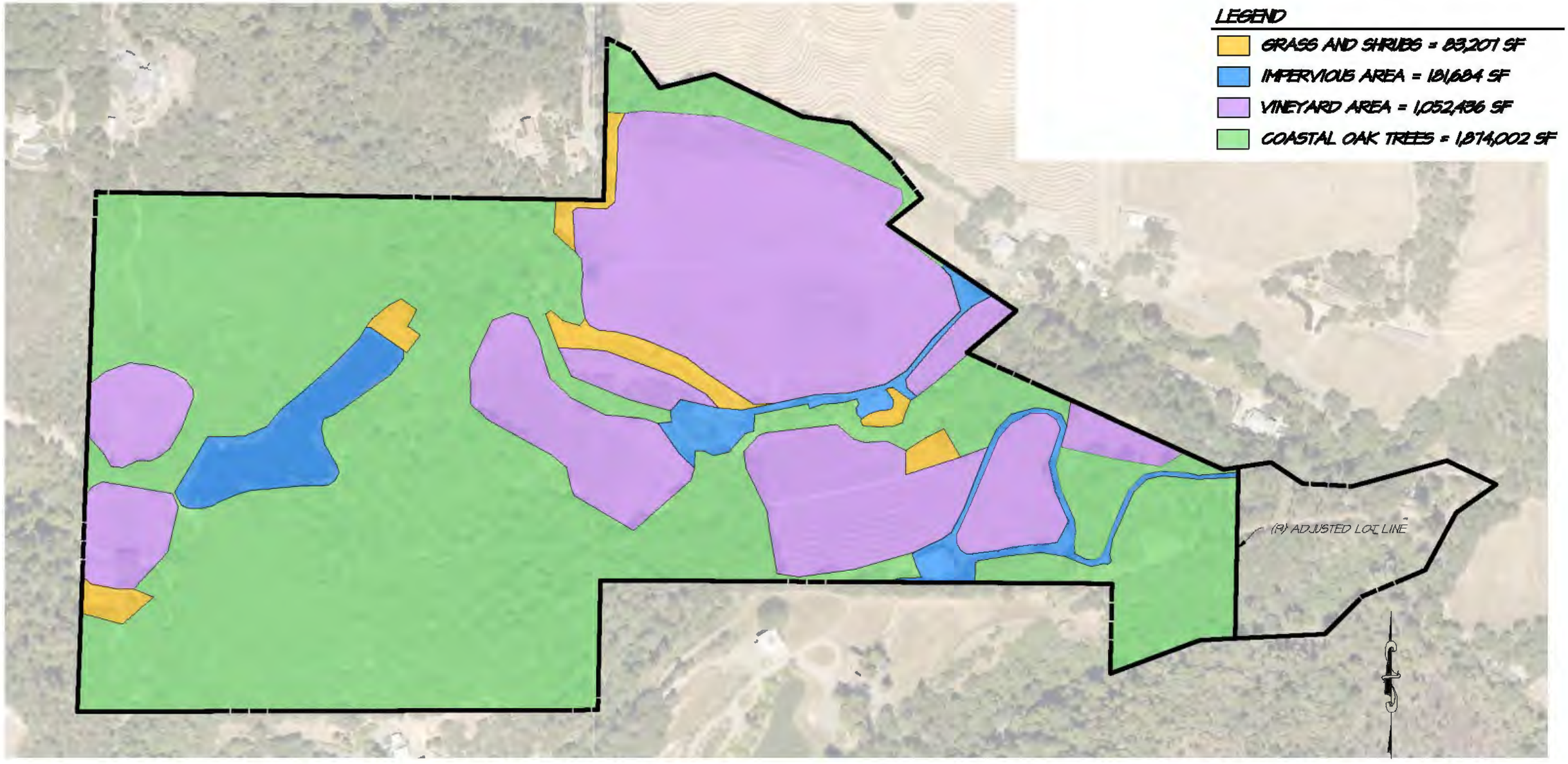
Groundwater Recharge Rate						
Site	Total Rainfall (ft^3/yr)	Total Crop Evapotranspiration (ft^3/yr)	Total Runoff (ft^3/yr)	Total Stormwater loss on site (ft^3/yr)	Groundwater Recharge Rate (ft^3/yr)	Groundwater Recharge Rate (ac-ft/ac/yr)
Impervious Area	492,364	0	443,127	443,127	49,236	0.27
Vineyard Area	2,852,102	83,002	1,711,261	1,794,263	1,057,839	1.01
Grass and Shrubs	225,491	55,779	81,177	136,956	88,535	1.06
Coastal Oak Trees	5,078,545	812,880	3,453,411	4,266,290	812,255	0.43
Total	**8,648,502**	**951,661**	**5,688,976**	**6,640,637**	**2,007,865**	**0.63**

My Map



https://prism.oregonstate.edu/recent/ (data modified by LSCE and Napa Co. PBES) | Esri Community Maps Contributors, County of Napa, Sonoma County, California State Parks, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA | Esri Community Maps Contributors, County of Napa, Sonoma County, California State Parks, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA | Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | Source: Esri, USDA FSA

DIAMOND CREEK VINEYARDS
GROUNDWATER RECHARGE EXHIBIT



GRAPHIC SCALE

250 0 250 500

(IN FEET)
1 inch = 250 FT

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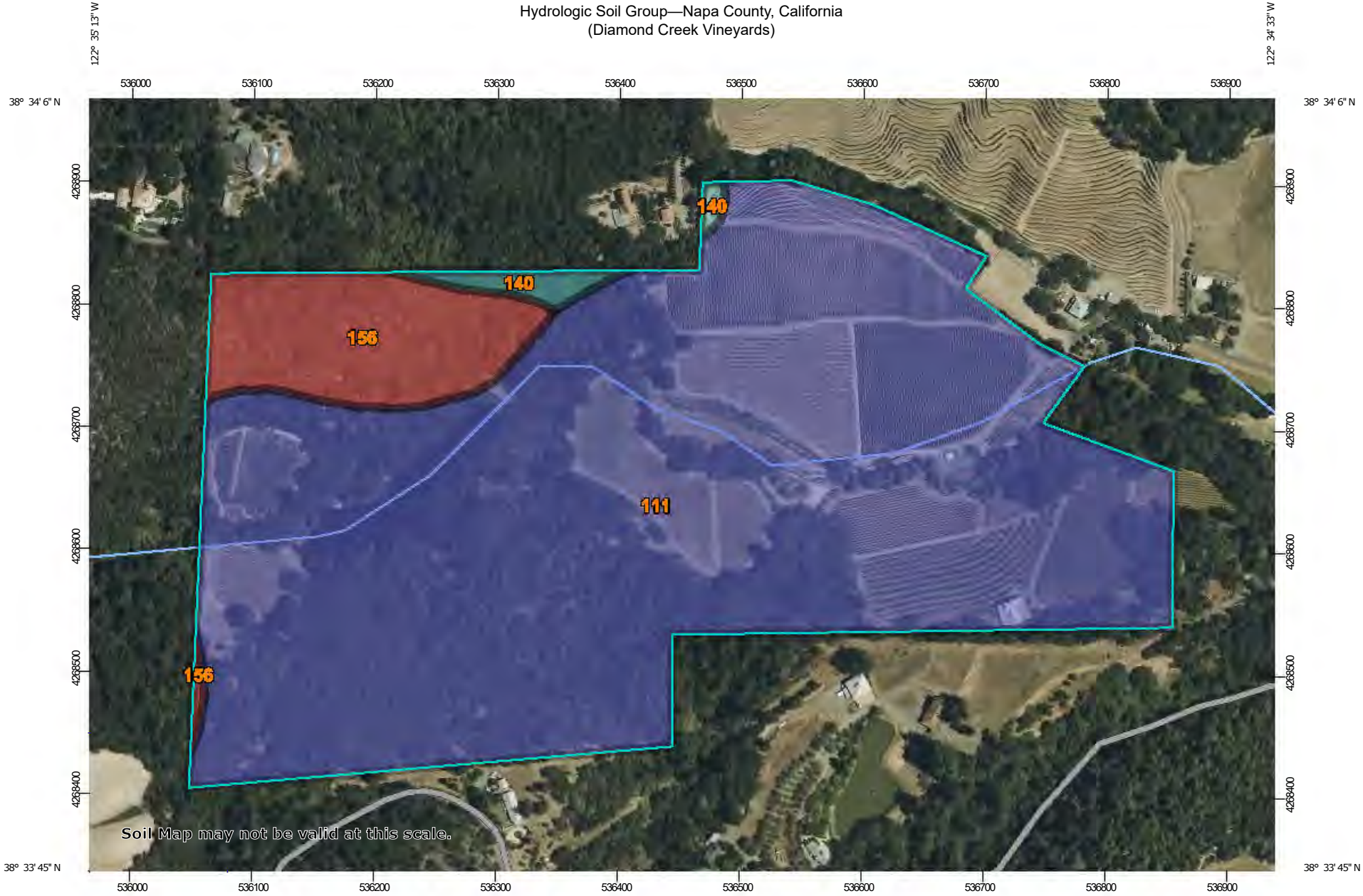
JAN. 23, 2025 4120020.0 Exh-GW Recharge.dwg

Hydrologic Soil Group—Napa County, California
(Diamond Creek Vineyards)



Map Scale: 1:4,440 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Survey Areas

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals
8-Digit Hydrologic Units

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Napa County, California
Survey Area Data: Version 13, May 29, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 2, 2019—Jul 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
111	Boomer-Forward-Felta complex, 5 to 30 percent slopes	B	60.5	89.2%
140	Forward silt loam, 12 to 57 percent slopes, MLRA 15	C	0.9	1.3%
156	Kidd loam, 30 to 75 percent slopes	D	6.4	9.5%
Totals for Area of Interest			**67.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

TABLE 1. Crop coefficients used in daily modeling of soil water processes in vineyards, oak trees and grasslands

Vineyards		Oak trees		Grasslands	
Period	K_c	Period	K_c	Period	K_c
3/1–4/15	0.10	3/1–3/31	0.5	3/1–3/15	0.90
4/16–4/30	0.20	4/1–10/1	0.6	3/16–4/30	0.95
5/1–5/15	0.25	10/2–11/25	0.5	5/1–5/15	0.25
5/16–5/31	0.30	11/26–2/28	0.4	5/16–6/15*	0.10
6/1–6/15	0.35			6/16*–10/13	0.00
6/16–6/30	0.40			10/14–10/31	0.25
7/1–9/30	0.50			11/1–2/28	0.75
10/1–10/15	0.30				
10/16–10/31	0.20				
11/1–11/15	0.15				
11/16–11/30	0.05				
12/1–2/28	0.01				

Sources: Allen et al. 1998 (grasses and trees), Caprile 2007 (vineyards).
* Variable date depending on available soil moisture.

Oak Trees - weighted average for October to March

Time Period	# of Days	K_C	Days * K^C	
3/1-3/31	31	0.5	15.5	
10/01	1	0.6	0.6	Weighted Kc=
10/2-11/25	55	0.5	27	80.7/182 = 0.44
11/26-2/28	95	0.4	37.6	
Totals=	182		80.7	

Vineyard - weighted average for October to March

Time Period	# of Days	K_C	Days * K^C	
3/1-4/15	31	0.1	3.1	
10/1-10/15	15	0.3	4.5	
10/16-10/31	16	0.2	3.2	
11/1-11/15	15	0.15	2.25	Weighted Kc=
11/16-11/30	15	0.05	0.75	14.7/182 = 0.08
12/1-2/28	90	0.01	0.9	
Total=	182		14.7	

Grasslands - weighted average for October to March

Time Period	# of Days	K_C	Days * K^C	
3/1-3/15	15	0.9	13.5	
3/16-3/31	16	0.95	15.2	Weighted Kc=
10/1-10/13	13	0.00	0.00	123.2/182 = 0.68
10/14-10/31	18	0.25	4.5	
11/1-2/28	120	0.75	90	
Totals=	182		123.2	

Grass & Shrubs

WATERSHED TYPES AND FACTORS

RUN-OFF PRODUCING CHARACTERISTICS OF WATERSHEDS SHOWING FACTORS FOR EACH CHARACTERISTIC FOR VARIOUS WATERSHED TYPES				
WATERSHED TYPES AND FACTORS				
Run-off Producing Features	**Extreme**	**High**	**Normal**	**Low**
Relief	**0.28 – 0.38** Steep, rugged terrain, with average slopes above 30%	**0.20 – 0.28** Rolling, with average slopes of 10 to 30%	0.14 **0.14 – 0.20** Rolling, with average slopes of 5 to 10%	**0.08 – 0.14** Relatively flat land, with average slopes of 0 to 5%
Soil Infiltration	**0.12 – 0.16** No effective soil cover either rock or thin soil mantle of negligible infiltration capacity.	**0.08 – 0.12** Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.	0.08 **0.06 – 0.08** Normal; well drained light and medium textured soils sandy loams, silt, and silt loams.	**0.04 – 0.06** Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.
Vegetation Cover	**0.12 – 0.16** No effective plant cover; bare or very sparse cover.	**0.08 – 0.12** Poor to fair; clean cultivation crops or poor natural cover; less than 20% of drainage area under good cover.	**0.06 – 0.08** Fair to good; about 50% of area in good grassland or woodland; not more than 50% of area in cultivated crops.	0.06 **0.04 – 0.06** Good to excellent; about 90% of drainage area in good grassland, woodland, or equivalent crop.
Surface	**0.10 – 0.12** Negligible; surface depressions, few and shallow; drainage ways steep and small; no marshes.	0.08 **0.08 – 0.10** Low well-defined system of small drainage ways; no ponds or marsh.	**0.06 – 0.08** Normal; considerable surface depression storage; lakes, ponds, and marshes.	**0.04 – 0.06** High; surface storage high; drainage system not sharply defined; large floodplain storage or large number of ponds or marshes.

THE RUNOFF FACTOR IS DETERMINED BY THE SUM OF THE FACTORS FOR RELIEF INFILTRATION, COVER, AND SURFACE. NOT APPLICABLE TO BUILT UP AREAS.

FIGURE 3

Sum = 0.14 + 0.08 + 0.06 + 0.08 = 0.36

Coastal Oak Trees

WATERSHED TYPES AND FACTORS

RUN-OFF PRODUCING CHARACTERISTICS OF WATERSHEDS SHOWING FACTORS FOR EACH CHARACTERISTIC FOR VARIOUS WATERSHED TYPES				
WATERSHED TYPES AND FACTORS				
Run-off Producing Features	**Extreme**	**High**	**Normal**	**Low**
Relief	0.38 **0.28 – 0.38** Steep, rugged terrain, with average slopes above 30%	**0.20 – 0.28** Rolling, with average slopes of 10 to 30%	**0.14 – 0.20** Rolling, with average slopes of 5 to 10%	**0.08 – 0.14** Relatively flat land, with average slopes of 0 to 5%
Soil Infiltration	0.12 **0.12 – 0.16** No effective soil cover either rock or thin soil mantle of negligible infiltration capacity.	**0.08 – 0.12** Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.	**0.06 – 0.08** Normal; well drained light and medium textured soils sandy loams, silt, and silt loams.	**0.04 – 0.06** Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.
Vegetation Cover	**0.12 – 0.16** No effective plant cover; bare or very sparse cover.	**0.08 – 0.12** Poor to fair; clean cultivation crops or poor natural cover; less than 20% of drainage area under good cover.	**0.06 – 0.08** Fair to good; about 50% of area in good grassland or woodland; not more than 50% of area in cultivated crops.	0.06 **0.04 – 0.06** Good to excellent; about 90% of drainage area in good grassland, woodland, or equivalent crop.
Surface	0.12 **0.10 – 0.12** Negligible; surface depressions, few and shallow; drainage ways steep and small; no marshes.	**0.08 – 0.10** Low well-defined system of small drainage ways; no ponds or marsh.	**0.06 – 0.08** Normal; considerable surface depression storage; lakes, ponds, and marshes.	**0.04 – 0.06** High; surface storage high; drainage system not sharply defined; large floodplain storage or large number of ponds or marshes.

THE RUNOFF FACTOR IS DETERMINED BY THE SUM OF THE FACTORS FOR RELIEF INFILTRATION, COVER, AND SURFACE. NOT APPLICABLE TO BUILT UP AREAS.

FIGURE 3

Sum = 0.38 + 0.12 + 0.06 + 0.12 = 0.68

Vineyard Area

WATERSHED TYPES AND FACTORS

RUN-OFF PRODUCING CHARACTERISTICS OF WATERSHEDS SHOWING FACTORS FOR EACH CHARACTERISTIC FOR VARIOUS WATERSHED TYPES				
WATERSHED TYPES AND FACTORS				
Run-off Producing Features	**Extreme**	**High**	**Normal**	**Low**
Relief	**0.28 – 0.38** Steep, rugged terrain, with average slopes above 30%	0.20 **0.20 – 0.28** Rolling, with average slopes of 10 to 30%	**0.14 – 0.20** Rolling, with average slopes of 5 to 10%	**0.08 – 0.14** Relatively flat land, with average slopes of 0 to 5%
Soil Infiltration	0.16 **0.12 – 0.16** No effective soil cover either rock or thin soil mantle of negligible infiltration capacity.	**0.08 – 0.12** Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.	**0.06 – 0.08** Normal; well drained light and medium textured soils sandy loams, silt, and silt loams.	**0.04 – 0.06** Slow to take up water; clay or shallow loam soils of low infiltration capacity imperfectly or poorly drained.
Vegetation Cover	**0.12 – 0.16** No effective plant cover; bare or very sparse cover.	0.12 **0.08 – 0.12** Poor to fair; clean cultivation crops or poor natural cover; less than 20% of drainage area under good cover.	**0.06 – 0.08** Fair to good; about 50% of area in good grassland or woodland; not more than 50% of area in cultivated crops.	**0.04 – 0.06** Good to excellent; about 90% of drainage area in good grassland, woodland, or equivalent crop.
Surface	0.12 **0.10 – 0.12** Negligible; surface depressions, few and shallow; drainage ways steep and small; no marshes.	**0.08 – 0.10** Low well-defined system of small drainage ways; no ponds or marsh.	**0.06 – 0.08** Normal; considerable surface depression storage; lakes, ponds, and marshes.	**0.04 – 0.06** High; surface storage high; drainage system not sharply defined; large floodplain storage or large number of ponds or marshes.

THE RUNOFF FACTOR IS DETERMINED BY THE SUM OF THE FACTORS FOR RELIEF INFILTRATION, COVER, AND SURFACE. NOT APPLICABLE TO BUILT UP AREAS.

FIGURE 3

Sum = 0.20 + 0.16 + 0.12 + 0.12 = 0.60

Appendix 5

Well Completion Reports, Well Yield Reports & Well #2 Inspection Report

ORIGINAL
File with DWR

Page 1 of 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. 530550

DWR USE ONLY — DO NOT FILL IN
STATE WELL NO./STATION NO.: 08N06W07
LATITUDE / LONGITUDE
APN/TRS/OTHER

Owner's Well No. ____
Date Work Began 10-28-97, Ended 11-7-97
Local Permit Agency Napa County Environmental Mgmt.
Permit No. 45942 Permit Date 10-28-97

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 140 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	20	clay with embedded boulders
20	45	clay with embedded rock
45	62	brown clay
62	85	green clay
85	110	dark volcanic rock
110	180	brown volcanic mix
180	380	tan fractured volcanic mix
		CONT. CASING LAYOUT
210	350	PVC 8" .032 screen
350	360	PVC 8" blank

TOTAL DEPTH OF BORING 380 (Feet)
TOTAL DEPTH OF COMPLETED WELL 360 (Feet)

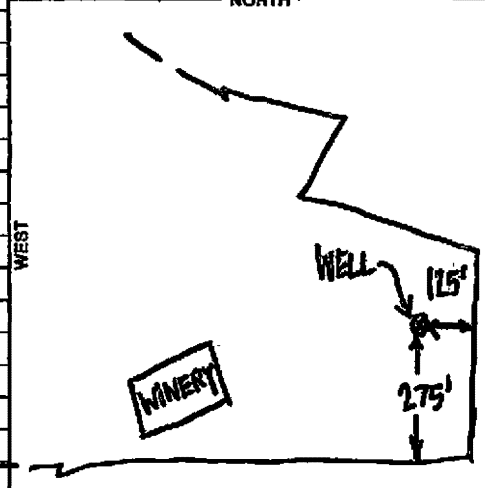
WELL OWNER

N
M
di

WELL LOCATION

Address same
City
County Napa
APN Book 020 Page 440 Parcel 004
or Township ___ Range ___ Section ___
or Latitude ___ DEG. ___ MIN. ___ SEC. NORTH Longitude ___ DEG. ___ MIN. ___ SEC. WEST

LOCATION SKETCH



Illustrate or Describe Distance of Well from Landmarks such as Roads, Buildings, Fences, Rivers, etc. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) (✓)

___ MONITORING
WATER SUPPLY
___ Domestic
___ Public
X Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD Rotary FLUID bentonite

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 96 (Ft.) & DATE MEASURED 11-12-97
ESTIMATED YIELD* 300 (GPM) & TEST TYPE air lift
TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN N/A (Ft.)
* *May not be representative of a well's long-term yield.*

CASING(S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE (IF ANY) (Inches)
0	55	15								
55	380	12¼								
0	130		X				PVC F480	8	SDR-21	
130	210			X			PVC F480	8	SDR-21	.032
210	220		X				PVC F480	8	SDR-21	

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	3	X			concrete
3	50		X		grout
50	360			X	gravel

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 HUCKFELDT WELL DRILLING (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 2110 Penny Lane CITY Napa STATE CA ZIP 94559
Signed Don Huckfeldt WELL DRILLER/AUTHORIZED REPRESENTATIVE
DATE SIGNED 11-13-97
C-57 LICENSE NUMBER 439-746

DWR 188 REV. 7-80

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

1487

WELL #1 - WELL REPORT

Phone: 707 823 3191 **Fax:** 707 317 0057 **Email:** rayswelltesting@gmail.com **Lic#**:903708
Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 09/17/20
Report #: 12162-2
Report By: Matt Owens

Subject Property Address: 1500 Diamond Mountain Rd, Calistoga CA 94515
Customer Name: Diamond Creek Vineyards – c/o Graham Wehmeier

WELL DATA:

Location/Description of well:	New Well –Right of vineyard road near saloon building
Type of Well:	Drilled
Depth of Well:	Probe stopped at 140 Feet in casing
Diameter of Well Casing:	11” O.D. Steel at surface
Sanitary Seal (plate seal at top of well):	Yes
Annular Well Seal (in ground seal of bore hole):	Unknown – Please refer to well log

PUMP DATA:

Pump HP and Type:	50 HP Submersible Pump End on 60 HP 3 PH 460V Motor Per notes in control panel
Depth of Pump Suction:	Unknown – Please refer to installer records
Size of Tee at Well Head:	4” tee
Submersible Cable Size:	#2-4 cable
Water Level Control:	ABB PST105-600-70 Controller
Backpressure Test:	N/A

WELL PRODUCTION SUMMARY (see next page for pumping log):

Length of Test: 1 Hour 45 Minutes
Type of Test: Drawdown

Static Water Level:	107.9 Feet	**Starting Flow**	320 GPM
Water Level Drawdown:	20.1 Feet		
Final Pumping Level:	128 Feet		

WATER LEVEL RECOVERY SUMMARY:

Pre Test Static Water Level:	107.9 Feet
Post Test Static Water Level:	111 Feet
Water Level Drawdown:	20.1 Feet
Water Level Recovery:	17 Feet
Water Level Recovery as % of Drawdown:	84.58%
Length Between End of Test and Recovery:	1 Hour

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
09/17/20	11:30 AM	0 Minutes	107.9	Clear	No	No	320
09/17/20	11:45 AM	15 Minutes	123.3	Clear	No	No	320
09/17/20	12:00 PM	15 Minutes	124.1	Clear	No	No	320
09/17/20	12:15 PM	15 Minutes	125.3	Clear	No	No	320
09/17/20	12:30 PM	15 Minutes	126	Clear	No	No	320
09/17/20	12:45 PM	15 Minutes	126.8	Clear	No	No	320
09/17/20	01:00 PM	15 Minutes	127.8	Clear	No	No	320
09/17/20	01:15 PM	15 Minutes	128	CIRCUIT BREAKER TRIPPING, STOPPED TEST			

Final Pumping Level: 128 **Feet**

WATER LEVEL RECOVERY DATA:

Date	Time	Interval	Water Level	Recovery %
09/17/20	02:15 PM	1 Hour	111	84.58%

Final post test static level measurement 111 Feet
Final Water Level Recovery as % of Drawdown: 84.58%
Length of time between end of test and recovery: 1 Hour

Water levels and well depth are measured as feet below top of well casing unless otherwise noted.

DISCLAIMER:
Results of well production are accurate only at time of test. We cannot predict future production or water yield.

WATER QUALITY: (The following samples are being analyzed, please refer to follow up report)
Analysis Choice: Residential + Irrigation Package **Turnaround:** Standard

Wellbore Video Report

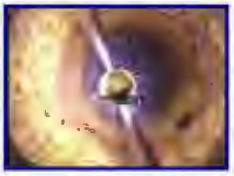
Dr. Well, Water Well Services, Inc.
P.O. Box 1685 Fair Oaks, CA. 95628
Phone: (916) 536-9319 Fax: (916) 962-7381 Web: www.drwaterwell.com

Company: Imboden Pump | Invoice No: | Run No.: 1
Address: 1030 Pueblo Ave | Well Number:
City: Napa | State: CA | Zip: 94558 | Survey Date: Apr 2, 2024
Requested By: Mike | P.O.: | Well Owner:
Copy To: | Camera: 1 5/8" Color Camera
Reason For Survey: General Inspection | Zero Datum: Top of Casing
Operator: Sarah Schwedler | Lat.: 38.5661991 | Long.: -122.5797594 | Sec: | Twp: | Rge:
Location: 1500 Diamond Mountain, Calistoga | Depth: | Van: 3
Casing I.D. At Surface: 7.75" | I.D. Reference: Measured | Casing Corrosion: Moderate

(NOTE: Latitude and Longitude values determined using a recreational GPS accurate to about +/- 45'. SEC, TWP and RGE then determined using the TRS conversion program, accuracy not guaranteed.)

SELECTED WELLBORE SNAPSHOTS

1'

4'

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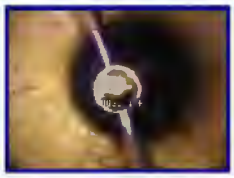
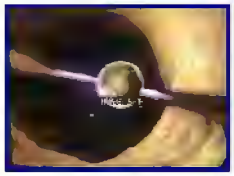
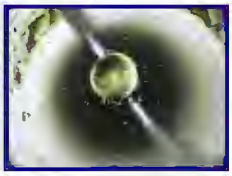

23'

57'

58'

68'

100'

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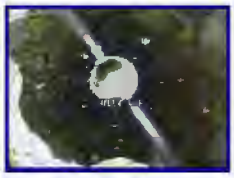
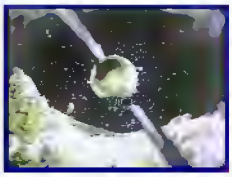

130'

138'


TRUE DEPTHS (SideScan - Feet)	WELLBORE / CASING INFORMATION
1'	17" Down, Casing Reduces To 6 1/2" ID
4'	Static Water Level (SWL)
23'	Perforations, Top Of Torch Cut Slots (23-55) 80% Plugged
57'	Casing Ends
58'	Cavity
68'	Cavity
100'	Downview Of Borehole
115'	Cavity
130'	Cavity
138'	Fill, Bottom, End of Survey

 Notes:

WELL #2 - WELL REPORT

Phone: 707 823 3191 **Fax:** 707 317 0057 **Email:** rayswelltesting@gmail.com **Lic#**:903708
Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 09/17/20
Report #: 12162-1
Report By: Matt Owens
Subject Property Address: 1500 Diamond Mountain Rd, Sebastopol CA 95472
Customer Name: Diamond Creek Vineyards – c/o Graham Wehmeier

WELL DATA:

Location/Description of well:	Old Well – Near Pool area near creek
Type of Well:	Drilled
Depth of Well:	Probe stopped at 75 Feet in casing
Diameter of Well Casing:	7- 1/4" O.D. Steel
Sanitary Seal (plate seal at top of well):	No
Annular Well Seal (in ground seal of bore hole):	Unknown – Please refer to well log

PUMP DATA:

Pump HP and Type:	20 HP 3PH 230V Submersible, 175SR20F66-0863
Depth of Pump Suction:	Unknown – Please refer to installer records
Size of Tee at Well Head:	3" tee
Submersible Cable Size:	#4-4
Water Level Control:	No
Backpressure Test:	150 GPM @ 280' TDH

WELL PRODUCTION SUMMARY (see next page for pumping log):

Length of Test: 4 Hours
Type of Test: Drawdown & Constant Pumping Level

Static Water Level:	44.4 Feet	**Starting Flow**	150 GPM
Water Level Drawdown:	18.3 Feet		
Final Pumping Level:	62.7 Feet	**Final Flow**	160 GPM

WATER LEVEL RECOVERY SUMMARY:

Pre Test Static Water Level:	44.4 Feet
Post Test Static Water Level:	44.4 Feet
Water Level Drawdown:	18.3 Feet
Water Level Recovery:	18.3 Feet
Water Level Recovery as % of Drawdown:	100.00%
Length Between End of Test and Recovery:	50 Minutes

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
09/17/20	09:40 AM	0 Minutes	44.4	Clear	No	No	150
09/17/20	09:55 AM	15 Minutes	60.5	Clear	No	No	180
09/17/20	10:10 AM	15 Minutes	61.2	Clear	No	No	180
09/17/20	10:25 AM	15 Minutes	61.8	Clear	No	No	180
09/17/20	10:40 AM	15 Minutes	62	Clear	No	No	180
09/17/20	10:55 AM	15 Minutes	62.2	Clear	No	No	180
09/17/20	11:10 AM	15 Minutes	62.4	Clear	No	No	180
09/17/20	11:25 AM	15 Minutes	62.6	Clear	No	No	180
09/17/20	11:40 AM	15 Minutes	62.7	Clear	No	No	170
09/17/20	11:55 AM	15 Minutes	62.7	Clear	No	No	170
09/17/20	12:10 PM	15 Minutes	62.7	Clear	No	No	160
09/17/20	12:25 PM	15 Minutes	62.7	Clear	No	No	160
09/17/20	12:40 PM	15 Minutes	62.7	Clear	No	No	160
09/17/20	12:55 PM	15 Minutes	62.7	Clear	No	No	160
09/17/20	01:10 PM	15 Minutes	62.7	Clear	No	No	160
09/17/20	01:25 PM	15 Minutes	62.7	Clear	No	No	160
09/17/20	01:40 PM	15 Minutes	62.7	Clear	No	No	160

Final Pumping Level: 62.7 **Feet**
Final Flow Rate: 160 **GPM**

WATER LEVEL RECOVERY DATA:

Date	Time	Interval	Water Level	Recovery %
09/17/20	02:30 PM	50 Minutes	44.4	100.00%

Final post test static level measurement: 44.4 Feet
Final Water Level Recovery as % of Drawdown: 100.00%
Length of time between end of test and recovery: 50 Minutes

Water levels and well depth are measured as feet below top of well casing unless otherwise noted.

DISCLAIMER:
Results of well production are accurate only at time of test. We cannot predict future production or water yield.

WATER QUALITY: (The following samples are being analyzed, please refer to follow up report)
Analysis Choice: Residential + Irrigation Packag **Turnaround:** Standard