NAPA VALLEY VINEYARD ENGINEERING, INC.
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DREW L. ASPEGREN, P.E.
CIVIL ENGINEER

ATLAS ROCK EROSION CONTROL PLAN FILE #P22-00031-ECPA

WATER DEMAND AND WATER AVAILABILITY ANALYSIS
March 10, 2023

It is proposed that the new vineyard (1.37 net acres) will be irrigated using groundwater. This analysis presents water demand for all uses on the Atlas Rock Holdings parcel.

There are no locally monitored irrigation systems from which to draw estimates of long-term water demand. This discussion is guided by the Napa County Water Availability Guidance Document, in which it is estimated that vineyard irrigation is 0.2 – 0.5 afa (acre-feet per annum), or 0.27 – 0.68 afa for the proposed 1.37 acre vineyard.

Also, a small two bedroom residence is planned for future replacement of the house destroyed in the 2017 fire. There will be no irrigated landscape. For this analysis, it will be assumed that two residents will live there full time, with two guests for up to forty days per year. Domestic water demand is:

Residents:	(2 people)(75 gal/day[1])(365 days/yr)	= 54,750 gal/yr
Guests:	(2 people)(75 gal/day[1])(40 days/yr)	= 6,000 gal/yr
	Total Domestic water demand	= 60,750 gal/yr = 0.18 afa

Additionally, the new trees to be planted in the restoration area will require irrigation for 2 years. The maximum irrigation will be 10 gallons/tree during the first year for the 4 new trees; the total water use will be 40 gallons, or .0001 af, an insignificant amount.

Historic rainfall analysis using the PRISM (The PRISM Climate Group at Oregon State University; http//prism.oregonstate.edu) Grid Cell Interpolation (Figure 1) provides water year (October 1 through September 30) rainfall data. As a conservative approach, annual rainfall data for the recent 10 year (2011/12 through 2020/21) interval (Table 1), is presented and it shows an average annual rainfall of 27.81" over that time span. On average, the 4.84-acre parcel will receive ±11.22 afa of rainfall. In the "Updated Hydrogeologic Conceptualization and Characterization of Conditions", LSCE and MBK Engineers provide an analysis which presents a groundwater recharge of 8% for the Milliken Creek watershed. At that rate, the Atlas Rock parcel will contribute an average of ± 0.90 afa (11.22 afa x 8%) to groundwater.

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[1] Exhibit B. California Code of Regulations, Title 23: Section 697

Assuming that domestic need is the primary use for water and that the maximum allowable use will be 0.90 afa, then 0.72 afa (0.90 – 0.18) is available for vineyard use, or 0.52 afa/acre, more than Napa County Guidelines and sufficient to sustain the proposed vineyard development. Attached (Attachments A-1, A-2) is the driller's log, and a recent aquifer test for the well which indicates a production rate of 22 gallons per minute. At that rate, the well will need to operate less than 2.5 hours/day to meet peak daily demand. Groundwater pumping will be monitored, and reports will be submitted to Napa County as required to demonstrate compliance.

Attached is a map (Figure 2) showing the existing project well's proximity to offsite wells and to significant streams. The well is greater than 500' from any offsite well, and it greater than 1500' from the nearest significant stream.

Location

State & County: California Napa

Coordinates: Latitude: 38.4020 Longitude: -122.2408 Elevation: 1348ft (411m)

Data Settings

- [x] Precipitation
- [ ] Minimum temp
- [ ] Mean temp
- [ ] Maximum temp
- [ ] Minimum VPD
- [ ] Maximum VPD
- [ ] Mean dewpoint temp
- [ ] Cloud transmittance
- [ ] Solar rad (horiz sfc)
- [ ] Solar rad (sloped sfc)
- [ ] Solar rad (clear sky)

( ) 30-year normals, 1991-2020 (monthly and annual)
Resolution: 4km 800m

( ) Annual values
start 1991 end 2020

( ) Single month values January
start 2017 end 2017

(•) Monthly values
start October 1991
end September 2021

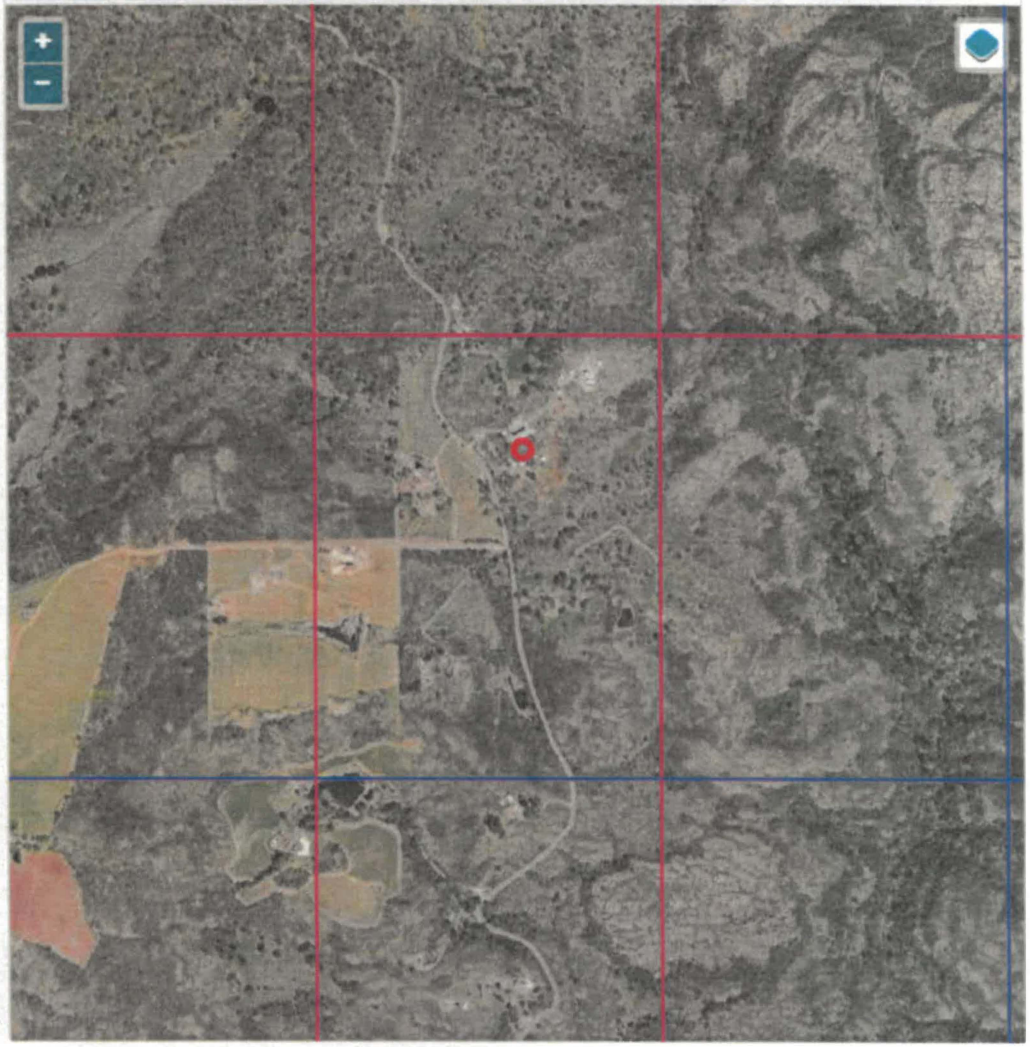
( ) Daily values
start 01 September 2021
end 31 May 2022

Data Stability: **stable (unlikely to change)**
(based on selected end date)

Units: (•) English ( ) SI (metric)

[x] Interpolate grid cell values (see text)

Click to select. Click & drag to pan. Use mouse wheel to zoom.



Controls

Retrieve Time Series | Download Time Series | Restore Previous Settings

Results can be **downloaded**, or **change the location/settings** to examine a different time series

ATLAS ROCK VINEYARD WELL SITE

Latitude: 38.4020 Longitude: -122.2408 Elevation: 1348ft (411m)
Precipitation, undefined
October 1991 - September 2021 (the PRISM day spans 24 hours ending at 1200 UTC on the day shown)

FIGURE 1

4km PRISM cells / interpolated
English units / Monthly values
Data stability: stable

Water Year Calculated From Monthly Rainfall Totals
Project: Atlas Rock Vineyard
Location: Atlas Peak Road
Date: 10/14/2022

TABLE 1

Water Year 2011-2012

Date	ppt (in)
2011-10	1.93
2011-11	2.37
2011-12	0.21
2012-01	5.87
2012-02	2.09
2012-03	9.28
2012-04	3.22
2012-05	0.25
2012-06	0.04
2012-07	0.00
2012-08	0.00
2012-09	0.00
Total	25.26

Water Year 2012-2013

Date	ppt (in)
2012-10	1.36
2012-11	9.32
2012-12	11.50
2013-01	0.99
2013-02	0.40
2013-03	1.08
2013-04	1.25
2013-05	0.25
2013-06	0.65
2013-07	0.00
2013-08	0.00
2013-09	0.67
Total	27.47

Water Year 2013-2014

Date	ppt (in)
2013-10	0.02
2013-11	1.27
2013-12	0.65
2014-01	0.12
2014-02	10.80
2014-03	2.92
2014-04	2.86
2014-05	0.05
2014-06	0.00
2014-07	0.00
2014-08	0.00
2014-09	0.66
Total	19.35

Water Year 2014-2015

Date	ppt (in)
2014-10	0.93
2014-11	3.11
2014-12	14.14
2015-01	0.00
2015-02	4.34
2015-03	0.11
2015-04	1.69
2015-05	0.00
2015-06	0.08
2015-07	0.02
2015-08	0.00
2015-09	0.30
Total	24.72

Water Year 2015-2016

Date	ppt (in)
2015-10	0.02
2015-11	1.76
2015-12	5.47
2016-01	10.19
2016-02	1.42
2016-03	11.33
2016-04	1.35
2016-05	0.27
2016-06	0.00
2016-07	0.00
2016-08	0.00
2016-09	0.00
Total	31.81

Water Year 2016-2017

Date	ppt (in)
2016-10	5.84
2016-11	3.15
2016-12	6.91
2017-01	16.99
2017-02	14.74
2017-03	4.31
2017-04	3.67
2017-05	0.07
2017-06	0.47
2017-07	0.00
2017-08	0.00
2017-09	0.00
Total	56.15

Water Year 2017-2018

Date	ppt (in)
2017-10	0.27
2017-11	4.87
2017-12	0.06
2018-01	4.97
2018-02	0.24
2018-03	6.86
2018-04	3.46
2018-05	0.07
2018-06	0.00
2018-07	0.00
2018-08	0.00
2018-09	0.00
Total	20.80

Water Year 2018-2019

Date	ppt (in)
2018-10	0.58
2018-11	5.57
2018-12	3.03
2019-01	9.25
2019-02	15.98
2019-03	6.03
2019-04	0.86
2019-05	4.04
2019-06	0.00
2019-07	0.00
2019-08	0.00
2019-09	0.04
Total	45.38

Water Year 2019-2020

Date	ppt (in)
2019-10	0.00
2019-11	0.88
2019-12	7.64
2020-01	2.41
2020-02	0.00
2020-03	1.47
2020-04	1.29
2020-05	1.66
2020-06	0.00
2020-07	0.00
2020-08	0.00
2020-09	0.00
Total	15.35

Water Year 2020-2021

Date	ppt (in)
2020-10	0.00
2020-11	1.89
2020-12	2.01
2021-01	4.01
2021-02	1.56
2021-03	2.13
2021-04	0.17
2021-05	0.00
2021-06	0.00
2021-07	0.00
2021-08	0.00
2021-09	0.04
Total	11.81

10 Yr Avg. Annual Rainfall

Date	ppt (in)
2011-2012	25.26
2012-2013	27.47
2013-2014	19.35
2014-2015	24.72
2015-2016	31.81
2016-2017	56.15
2017-2018	20.80
2018-2019	45.38
2019-2020	15.35
2020-2021	11.81
10 Yr Avg =	**27.81**

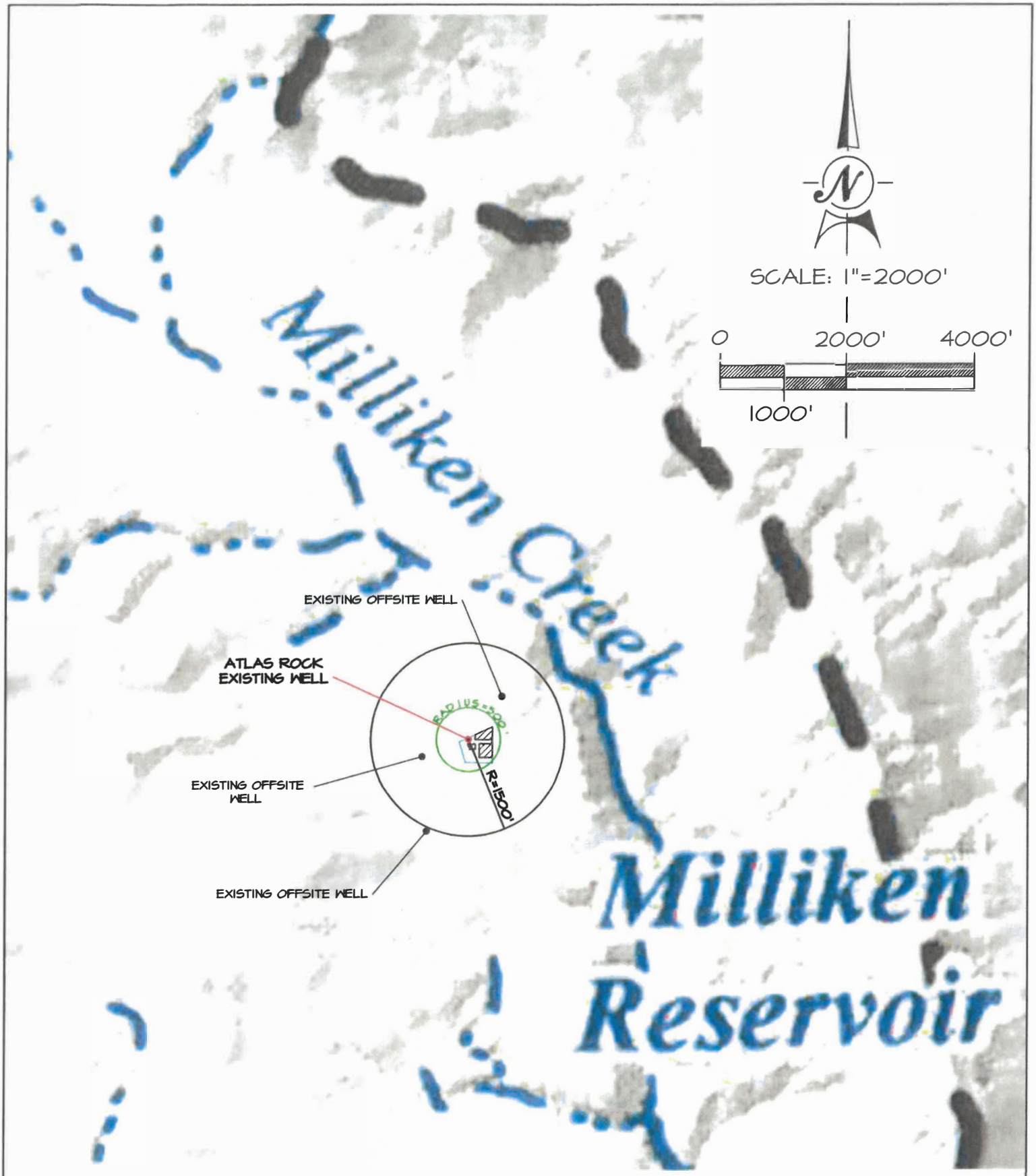


FIGURE 2

RELATIONSHIP OF ATLAS ROCK'S EXISTING WELL WITH NAPA COUNTY SIGNIFICANT STREAMS AND OFFSITE WELLS

ATLAS ROCK VINEYARD
3380 ATLAS PEAK ROAD

NVVE 10-14-22

TRIPLICATE
Owner's Copy

Page ___ of ___
Owner's Well No. 3 TBD
Date Work Began ___ Ended ___
Local Permit Agency 32638
Permit No. ___ Permit Date 2-19-93

#4469

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 429560

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

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DEPTH TO FIRST WATER 100 (Ft.) BELOW SURFACE

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION Describe material, grain size, color, etc.
0	60	brown ash, black boulders
60	210	hard black boulders
210	400	broken up volcanic ash

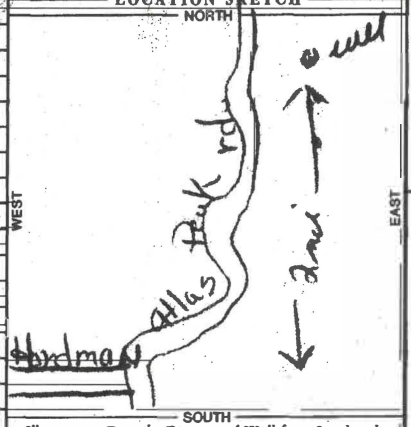
RECEIVED
JUN 21 1993
DEPT. OF ENVIRONMENTAL MANAGEMENT

TOTAL DEPTH OF BORING 400 (Feet)
TOTAL DEPTH OF COMPLETED WELL 400 (Feet)

Name [redacted]
Mailing Address [redacted]
CITY [redacted] STATE [redacted] ZIP [redacted]

WELL LOCATION
Address 3380 Atlas Peak
City Napa
County Napa
APN Book ___ Page ___ Parcel 033-010-059
or Township ___ Range ___ Section ___
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
X Domestic
___ Public
___ Irrigation
___ Industrial
___ "TEST WELL"
___ CATHODIC PROTECTION
___ OTHER (Specify)

DRILLING METHOD AIR FLUID AIR

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 100 (Ft.) & DATE MEASURED 2-18-93
ESTIMATED YIELD 80* (GPM) & TEST TYPE AIR LIFT
TEST LENGTH 3 (Hrs.) TOTAL DRAWDOWN 380 (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	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	200	9"	X				PLASTIC	5	160	.032
200	220	"		X						
220	280	"	X							
280	400	"		X						

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	23	X			

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 Pullam Well Drilling (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS 2877 Piedmont CITY Napa STATE Ca. ZIP 94558
Signed Bill Pullam (WELL DRILLER/AUTHORIZED REPRESENTATIVE) DATE SIGNED 2-19-93 C-57 LICENSE NUMBER 298677

DWR 188 REV. 7-90

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

EXHIBIT A-1

ATLAS ROCK VINEYARD
3380 ATLAS PEAK ROAD

NVVE 3-13-23 R2

DAVE BESS PUMP & WELL
LIC.# C-57-C-10 487027

1115 MT GEORGE AVE.
NAPA, CALIF. 94558
707-226-2539 / 253-0574

WATER WELL TEST
REPORT # W-18-036

LOCATION (well address): 3380 Atlas Peak Rd Napa CA Date 10-15-2018
TEST REQUESTOR: Steve Longo

SURFACE INSPECTION

CASING DIA. 5"pvc EST. AGE OF WELL Unknown DEPTH OF WELL Unknown
SANITARY SEAL (functional) PIPING SYSTEM (N/A)
ELECTRICAL SYSTEM (Over head/ Functional)
PRESSURE TANK (N/A)
WELL SIZE OF PUMP 2 (HP) Set @ 300'
OPERATING VOLTS: 239 L1 – 11.9 L2 – 12.1

FLOW TEST DATA

METHOD OF TEST: 2 HOUR OPEN FLOW DISCHARGE TEST USING THE INSTALLED PUMP AND EXISTING EQUIPMENT. (TEST EQUIPMENT USED), 2" FLOW METER, 2" THROTTLING DISCHARGE VALVE, 0/200 PRESSURE GAGE AND A POWERS WELL DEPTH STATIC METER.

TIME	RATE (GPM)	WATER LEVEL
09:41	23	219ft
10:00	22	236ft
11:00	22	236ft
11:41	22	236ft

STATIC LEVEL PRIOR TO TEST 219 FT STATIC LEVEL @ END OF TEST 236 FT
TOTAL DRAW DOWN DURING THIS TEST WAS 17 ft
(AVG.)GALLONS PER MIN. 22 FOR 2 HOURS OF TESTING

GENERAL COMMENTS

Well and well equipment in working condition @ time of testing. Well may produce more water if a bigger pump was installed.

TEST CONDUCTED BY _____ DATE: 10-15-2018
(optional) Bacteria sampled Yes X No ___ Chemical sampled: Yes ___ No X
Absent

Disclaimer: The data and conclusions provided herein are based upon the best information available to this company using standards and accepted practices of the water well drilling industry. However, well yield conditions are subject to dramatic changes in short periods of time due to usage and recharging of aquifers, etc. Therefore, the data and conclusions taken during this test are only valid of the day of the test and should not be relied upon to predict either the future quantity or quality of the well. This company makes no warranties either expressed or implied as to future water production and expressly disclaims and excludes any liability for consequential or incidental damages arising out of the breach of any expressed or implied warranty of future water production or out of any future use reported by the customer.

EXHIBIT A-2

ATLAS ROCK VINEYARD
3380 ATLAS PEAK ROAD

NVVE 3-13-23 R2

CALIFORNIA

Water Boards

STATE WATER RESOURCES CONTROL BOARD

REGIONAL WATER QUALITY CONTROL BOARDS

California Code of Regulations, Title 23

(http://ccr.oal.ca.gov)

Excerpts of Divisions 2, 3, and 5 Applicable to the Administration of Water Rights and SGMA

(Current as of January 1, 2021)

JANUARY 2021

CALIFORNIA STATE WATER RESOURCES CONTROL

EXHIBIT B

ATLAS ROCK VINEYARD
3380 ATLAS PEAK ROAD

NVVE 3-13-23 R2

§ 697. Examples of Amounts Considered Reasonably Necessary.

The amount of water considered reasonably necessary for certain uses when the appropriation will be by direct diversion shall be determined in the following manner:

(a) Irrigation Use.

(1) In most portions of the central valley of California and elsewhere in the State where similar conditions prevail a duty of one cubic foot per second continuous flow to each 80 acres shall be considered a reasonable headgate duty for most crops. Where there is a greater abundance of water and a heavy transportation loss, or the land to be irrigated is of a porous, sandy or gavelly character a continuous flow allowance of one cubic foot per second to each 50 acres may be considered reasonable. Under other conditions where water supply is less abundant and conditions are favorable to a more economical use a duty of one cubic foot per second to 150 acres may be considered reasonable for most crops. For the irrigation of rice the customary allowance shall be one cubic foot per second continuous flow to each 40 acres of irrigated land.

(2) The equivalent of these continuous flow allowances for any 30 -day period may be diverted in a lesser time at a greater rate so long as there is no interference with other users, and a clause allowing such rotation will be included in a permit issued for irrigation purposes.

(b) Domestic Use. Allowances for domestic use are variable, depending upon the character of the place of use, method of use, character of use and availability of water. The quantities considered reasonable for the respective domestic uses are as follows:

Homes, Resorts, Motels, Organization Camps, etc

Fully plumbed ..... 55 to 75 gallons per day per person
Sink and flush toilet only ..... 40 gallons per day per person
Sink and shower only ..... 35 gallons per day per person
Sink only ..... 25 gallons per day per person
Outside supply only ..... 15 gallons per day per person
Cafe, fountain, etc ..... 2.5 gallons per day per person

Camp Grounds

Depending upon facilities provided, allowances range from 5 gallons per day per person, where faucets only are provided, to 30 gallons per day per person where washbowls, showers, flush toilets and laundry trays are provided.

Lawn, Garden, Orchard and Grounds

Irrigation ..... 8.5 gallons per day per 100 square feet
Sprinkling to allay dust. ...7.5 to 10 gallons per day per 100 square feet

Livestock

Milch cows ..... 30 gallons per day per head
Horses ..... 15 gallons per day per head
Goats and hogs ..... 2.5 gallons per day per head

EXHIBIT B

ATLAS ROCK VINEYARD
3380 ATLAS PEAK ROAD