

Water Availability Analysis (Tier 3)

Winrod Vineyards
3465 State Highway 128
Napa County, CA

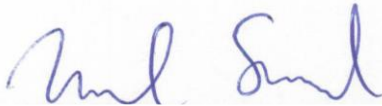
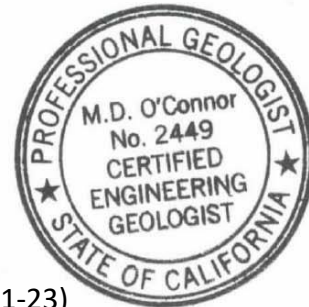
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May 9, 2023

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Appendix A: Well Completion Reports

Introduction

Winrod Vineyards is seeking permits in support of an Erosion Control Plan to develop approximately 13 acres of vineyard at 3465 State Hwy. 128 in Napa County California (APN 017-110-038). The project parcel is located in the Blossom Creek watershed approximately three miles northwest of Calistoga (Figure 1). This report contains a Tier 3 Water Availability Analysis (WAA) that provides a risk assessment for potential streamflow depletion for the proposed vineyard development. A Tier 1 WAA completed by Bartelt Engineering in September 2022 and revised in April 2023 was reviewed and relevant project and site information has been incorporated in this Tier 3 WAA. A Tier 2 WAA is not required of this project due to the fact that no neighboring wells are located within 500 ft of the project well. It is assumed that the reader is familiar with the Bartelt WAA and its conclusions.

This Tier 3 WAA has been developed with consideration of guidance provided in the Napa County Planning, Building, and Environmental Services (PBES) Water Availability Guidance Document formally adopted by the Napa County Board of Supervisors in May 2015.

Limitations

Groundwater systems of Napa County and the Coast Range are typically complex, and available data rarely allows for more than general assessment of groundwater conditions and delineation of aquifers. Hydrogeologic interpretations are based on the drillers' reports made available to us through the California Department of Water Resources, available geologic maps and hydrogeologic studies, and professional judgment. This analysis is based on limited available data and relies significantly on interpretation of data from disparate sources of disparate quality.

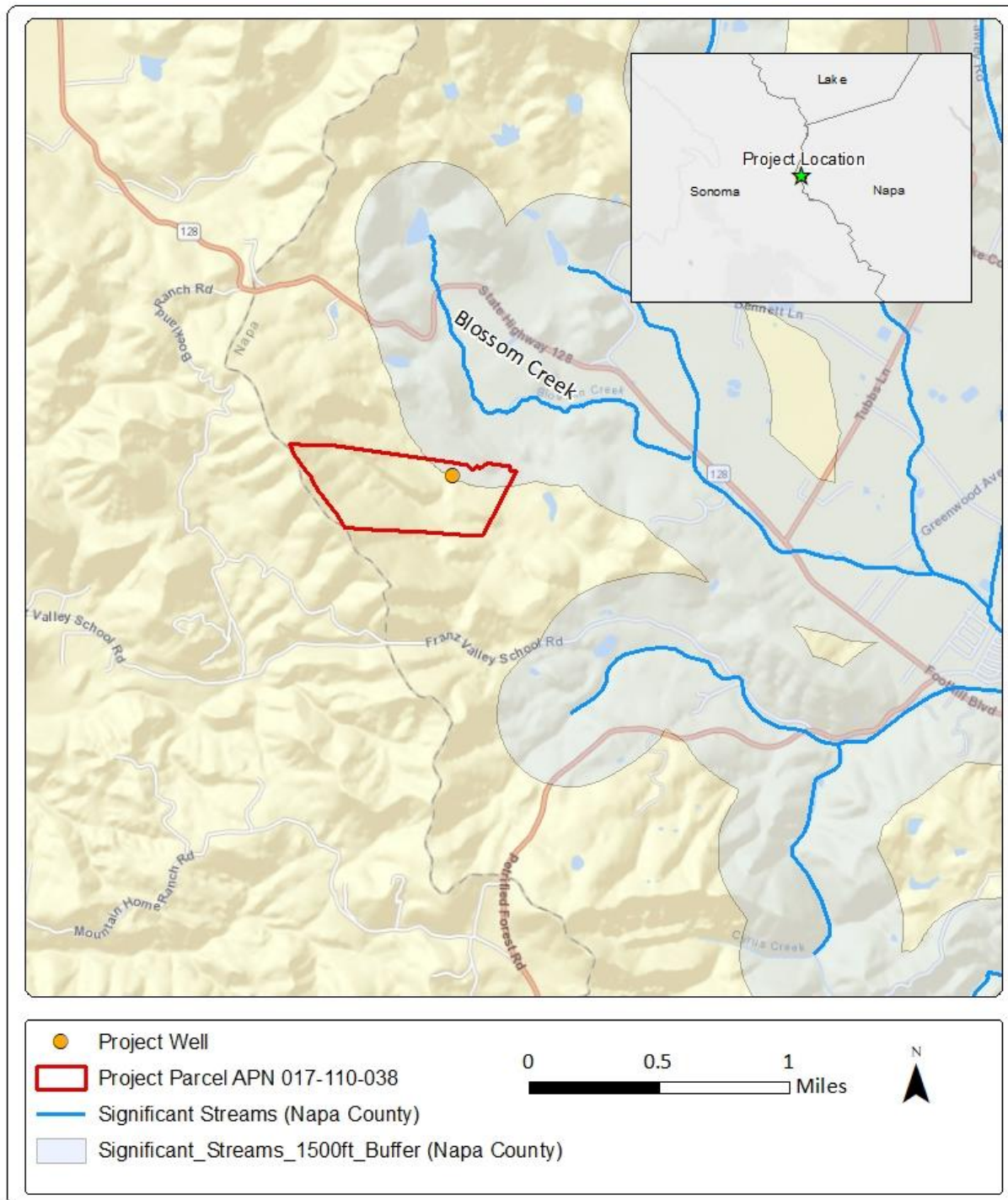


Figure 1. Project parcel location showing Napa County Significant Streams and 1,500 ft buffer.

Hydrogeologic Conditions

The project parcel is located in uplands on the northwestern margin of the Napa Valley in the Blossom Creek watershed. The geology mapped at the project site consists primarily of units from the Pliocene to late Miocene-aged Sonoma Volcanics (map units Tst, Tsa and Tsr) with Quaternary alluvial deposits filling the lower areas adjacent to Blossom Creek. Geologic mapping by Graymer et al. (USGS, 2007) shows the project parcel underlain by the Pumicious ash-flow tuff (Tst) and the Andesite to basalt lava flows (Tsa) (Figure 2).

In general, bedrock units of the Sonoma Volcanics have very low primary porosity and groundwater is stored in fractures resulting in highly variable well production. Where these fracture networks are extensive, aquifers can have relatively high transmissivities (Nishikawa, 2013). The andesitic unit has been described as comprised of individual lava flows displaying great variability in thickness and texture over short distances (Weaver 1949). Some units, such as unwelded tuff and volcanic sediments are somewhat more productive but overall are still considered low yielding. Given this heterogeneity it can be expected that hydrogeologic conditions exhibit similar spatial variability. Yields in bedrock units of the Sonoma Volcanics are reported to range from zero to as high as several hundred gallons per minute (gpm) (LSCE 2013).

The Sonoma Volcanics along with other Tertiary-aged geologic units act as a secondary aquifer unit associated with the adjacent Napa Valley Groundwater Basin and underlie the main alluvial aquifer. This fractured bedrock aquifer unit likely receives recharge via direct percolation of rainfall, inflows from any overlying alluvial units in addition to inflows from streambed infiltration from streams located along the margin of the Napa Valley as well as via mountain block recharge (LSCE, 2017).

Well Data

Well Completion Reports for wells near the project parcel were obtained through the California Department of Water Resources' Well Completion Report Map Application and through the County of Napa Planning, Building, and Environmental Services Department's Electronic Document Retrieval system. The subset of these logs which could be accurately georeferenced based on parcel and location sketch information are mapped in Figure 2. Well Completion Reports for these wells are compiled in Appendix A. Compilation and assessment of these well data are used to characterize the hydrogeology of the area relevant to this analysis.

The project well (Well 1, Figure 2) was completed in March 1996 to a depth of 200 feet. The driller's log indicates that this well is completed in brown, red and gray volcanic rocks and consistent with the locally mapped Andesite and Rhyolite lava flows of the Sonoma Volcanics (map units Tsa and Tsr). The well is screened from 100 to 200 feet below ground surface (bgs). At the time of completion, the well had a static water level of 60 feet and an estimated yield of 50+ gpm based on a 2-hour airlift test (Table 1) which resulted in 140 ft of drawdown. Per communications with Bartelt Engineering it is understood that the well has been fitted with a well pump with a maximum pumping capacity of 18 gpm (Paul Bartelt pers. comm., 2023).

Details regarding 12 other wells in the vicinity of the project shown in Figures 2 and 3 are summarized in Table 1 and provide a basis to describe local aquifer characteristics. Wells in the area of the project well have been constructed to an average depth of 244 ft bgs with an average depth to uppermost perforations of 80 ft bgs. Two wells in the vicinity of the project are screened (perforated) in Quaternary Alluvium and the remainder are screened either partially or completely within the underlying fractured bedrock aquifer comprised of the Sonoma Volcanics. The project well along with all other wells except Well 10 had static water levels above the top of uppermost perforations indicating that the local aquifer is under pressure and is confined or partially confined.

Table 1. Well Details

Well No.	1	2	3	4	5	6	7
Year Completed	1996	1997	1996	1980	1966	2016	2018
Well Depth (ft)	200	390	200	85	154	475	396
Static Water Level (ft)	60	15	25	24	20	55	70
Estimated Yield (gpm)	>50	300	100	5	45	100	15
Top of Screen (ft)	100	70	40	35	-	60	76
Bottom of Screen (ft)	200	390	140	85	-	475	396
Geologic Map Unit	Tsa	Tsa	Tst	Qha	Qpa	Tsr	Qf
WCR Reference No.	442577	475938	547471	95281	103228	992228	999596

Well No.	8	9	10	11	12	13
Year Completed	2007	1993	1973	1969	1977	2018
Well Depth (ft)	425	217	250	55	120	202
Static Water Level (ft)	50	60	100	50	25	23
Estimated Yield (gpm)	116	25	20	20	20	10
Top of Screen (ft)	105	60	70	146	90	102
Bottom of Screen (ft)	425	217	250	158	120	202
Geologic Map Unit	Tsr	Qpa	Qha	Qha	Qha	Tss
WCR Reference No.	1073648	471715	74700	11079	143898	E18-00054

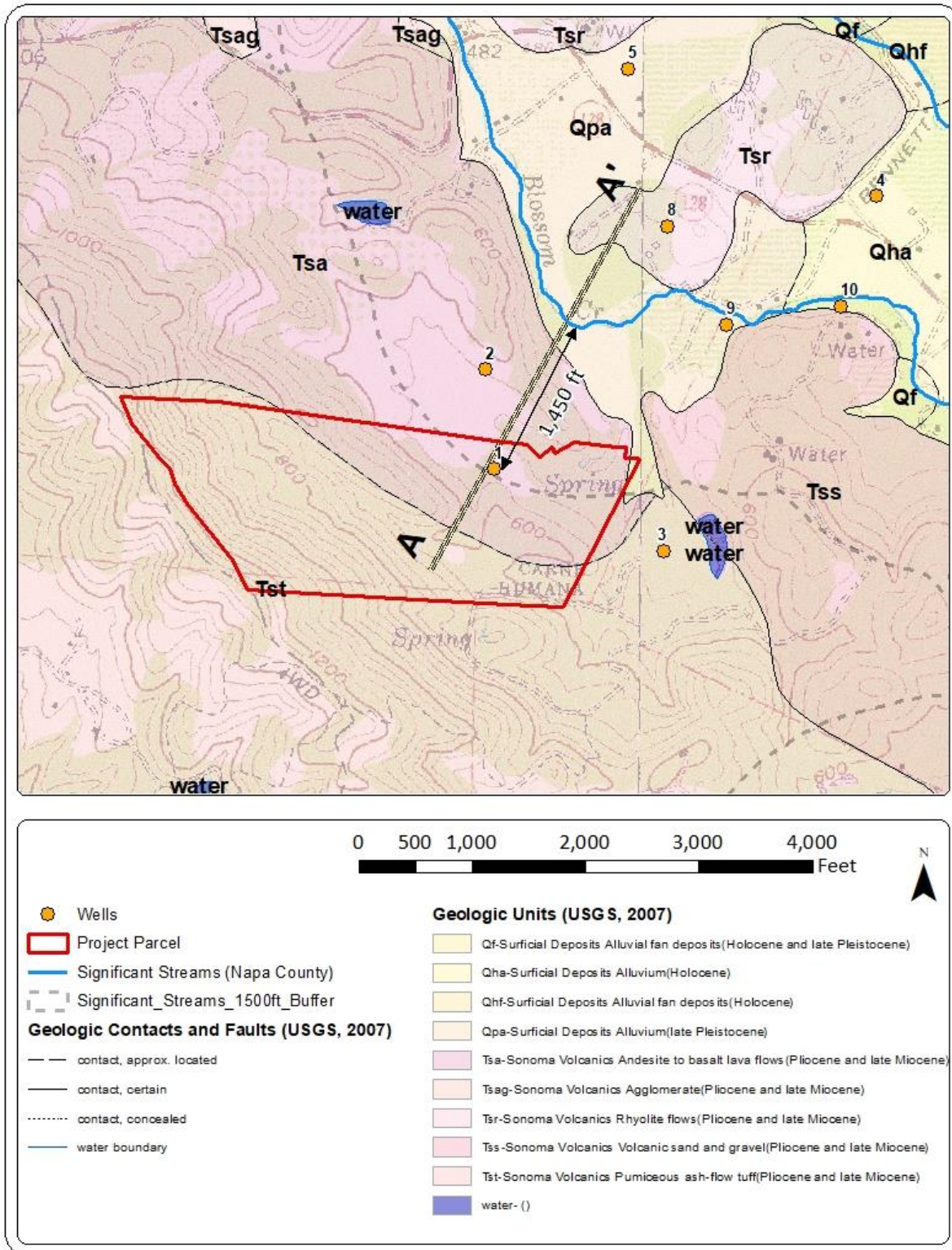


Figure 2: Surficial geology and locations of wells in the vicinity of the project parcel. Surficial geology based on data from the U.S. Geological Survey Geologic Map Western Sonoma and Eastern Napa Counties (Graymer et al., 2007).

Geologic Cross-Section

A geologic cross-section oriented southwest to northeast is shown in Figure 3 (see Figure 2 for location). Elevations on this cross-section range from a maximum of 680 feet on the ridgeline to the east of the project to a minimum of 470 feet near Blossom Creek. Drillers logs from WCR's from wells near the cross-section indicate that wells are constructed and screened entirely in bedrock units of the Sonoma Volcanics (Map Units Tsa and Tsr) extending a minimum of 400 feet below ground surface (bgs). Contacts between volcanic units are shown as zig-zag pattern to indicate their interbedded nature however for the purposes of this analysis all volcanic units are assumed to behave as a fractured bedrock aquifer with low primary porosity and most water found in fracture networks.

Aquifer conditions that can be inferred from data described in Table 1 can be generally described as follows. Static water levels from WCR's for the project well several other wells to the north and west of Blossom Creek in the vicinity of the project parcel are higher than streambed elevation of Blossom Creek at its nearest point to the project well. As shown on the cross-section, a ridge with a peak of approximately 575 feet separating Well 1 from Blossom Creek. Well 2 is constructed on this ridge with a reported static water level 15 feet bgs approximately 80 feet above the streambed elevation in Blossom Creek. Groundwater elevation in Well 2 provides evidence that groundwater elevation generally mimics topography and that there is a "mound" of groundwater underlying this ridge.

One consequence of this general characterization of local groundwater elevation is that the groundwater flow gradient in the immediate vicinity of the project well (Well 1) does not flow north toward the nearest point on Blossom Creek to the project well. Well 1 has a lower static water elevation than Well 2 which indicates that groundwater near Well 1 is expected to flow generally in an easterly direction. Consequently, the hypothetical flow path of groundwater flow from Well 1 toward Blossom Creek is substantially greater than the horizontal distance to the nearest point on Blossom Creek.

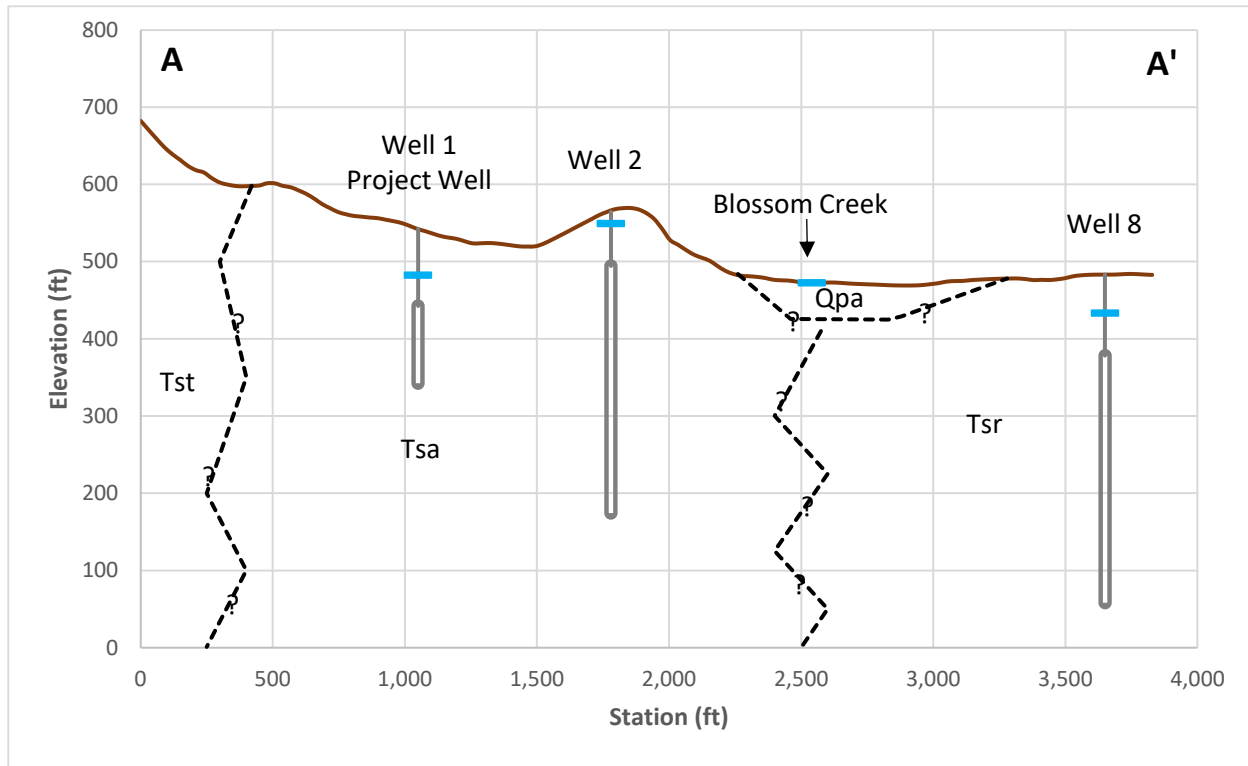


Figure 3: Hydrogeologic cross section A -A' through the project parcel (see Figure 2 for location and geologic map units. Note that approximately located contacts between Tst, Tsa and Tsr are shown in a zig-zag patterns to indicate interbedding of volcanic units.

Water Demand and Associated Pumping Regime

Water demand from this project has been estimated by Bartelt Engineering in the Tier 1 WAA. Use estimate tables from the Bartelt WAA are shown in Figure 4 below. Existing use includes residential demand plus existing vineyard and orchard irrigation totaling 2.74 acre-ft annually. Proposed use includes residential plus increased vineyard area irrigation (existing orchard area will be planted with vineyard) and additional heat protection which amounts to 10.21 acre-ft in an average year (6.21 acre-ft irrigation and 3.25 acre-ft heat protection). In a dry year when water conservation measures are to be implemented, total water use would be 8.66 acre-ft. These values were used to estimate groundwater pumping capacity required of Well 1.

Residential water use in the existing and proposed condition was estimated to be 0.75 acre-feet per year (AF/yr). This water demand is equivalent to continuous pumping throughout the year at 0.465 gpm.

The Tier 1 WAA proposed an irrigation schedule comprising 22 weeks between April 1st and August 31st. We selected the average year demand for this 22-week irrigation season to estimate pumping rates since this period of time will require the most ground water to meet project water demands. Over the 22-week irrigation season residential demand would total approximately 0.32 acre-ft (22 weeks/52 weeks x 0.75 acre-ft). Combined with the irrigation and heat protection use this totals to 9.78 acre-ft of total demand across the project parcel during the irrigation season

Assuming that the demand is met by pumping the well continuously throughout the irrigation season, a continuous pumping rate of 14.4 gpm would be required. For context, Well 1 has a pumping capacity of 18 gpm. To meet the maximum seasonal demand including residential, irrigation and heat protection, pumping at 18 gpm for about 19 hours daily would be required.

In addition to an existing water tank of unknown capacity a 50,000-gallon water storage tank is proposed to store water for irrigation. This tank could be filled prior to the irrigation season and will provide storage for a little more than half of the weekly irrigation plus residential demand and allow the well to be pumped at intervals giving the local aquifer time to recover between pumping cycles. To fill the 50,000-gallon tank while pumping at 18 gpm the pump would need to run for a total of 46.3 hours. This pumping time could be spread out across the week to refill the tank and meet daily demands depending on the exact irrigation schedule.

TABLE 2A: EXISTING WATER DEMAND	
Description	Estimated Water Usage (acre-feet/year)
Residential Primary Residence	0.75
Vineyard (4.6± acres, 3,213 vines) ⁴ Irrigation (Vineyard Blocks A, B, C, & D)	0.99
Orchard (Olive trees, 0.25± acres)	1.00
Total Existing Water Demand =	2.74

TABLE 2B: PROPOSED WATER DEMAND	
Description	Estimated Water Usage (acre-feet/year)
Residential Primary Residence	0.75
Vineyard (13.0± acres, 20,225 vines) ⁴ Irrigation (Vineyard Blocks 1, 2, & 3)	6.21
Heat Protection	3.25
Orchard	0.00
Total Proposed Water Demand =	10.21

⁴ Vineyard irrigation is based on irrigation schedule and number of emitters per vine provided by the Owner.

TABLE 2C: DRY YEAR WATER DEMAND	
Description	Estimated Water Usage (acre-feet/year)
Residential Primary Residence	0.75
Vineyard (13.0± acres, 20,225 vines) Irrigation 25% reduction (Vineyard Blocks 1, 2, & 3)	4.66
Heat Protection	3.25
Orchard	0.00
Total Dry Year Water Demand =	8.66

Figure 4. Water use Calculations from Bartelt Engineering WAA.

Groundwater-Surface Water Interactions

Napa County Tier 3 WAA guidance for assessment of groundwater-surface water interactions was modified by the emergency policy adopted in June 2022 along with other objectives. PBES guidance now identifies streams of concern for groundwater-surface water interaction; Blossom Creek lies to the north of the project site. Figures 1 and 2 display the location of project well, (Well 1) which is located approximately 1,450 ft from Blossom Creek and consequently requires analysis per Tier 3 criteria.

Blossom Creek is known to intersect Quaternary-aged alluvial deposits (Figure 2). Well 1 does not intersect alluvium and is only perforated within the Sonoma Volcanics, as shown in Figure 3. The Sonoma Volcanics underly the alluvium intersected by Blossom Creek, so it is possible that the underlying Sonoma Volcanics could deliver groundwater to the alluvium that could help maintain a degree of connectivity to surface flow in Blossom Creek.

Chapter 6 of the Napa Valley Subbasin Groundwater Sustainability Plan (GSP) describes groundwater and surface water conditions in the Napa Valley; Blossom Creek is identified as one of many tributaries to the Napa River with intermittent flow in a 2015 mapping effort by the Napa County Resource Conservation District (LSCE, 2022). In contrast to a perennial stream which is assumed to have a continuous hydraulic connection to groundwater, intermittent streams are believed to have the potential to be connected but for only limited periods of time.

The Napa Valley Integrated Hydrologic Model (NVIHM) prepared for the GSP by LSCE simulated the period 1988 through 2014 and investigates hydrologic connectivity between the Napa River and its tributaries with the underlying and adjacent aquifer (see Chapter 6 of LSCE, 2022). As presented in Figures 6-123 c-e (GSP Chapter 6), annual connectivity between Blossom Creek and the adjacent/underlying aquifer occurs between 2 to 13 weeks annually in the reach nearest the project well. No connectivity is reported for the period from June through October for the same reach. These data indicate that Blossom Creek is connected to groundwater within the alluvial units only for a portion of the year during winter months when streamflow is greatest and when project water demand will be least.

The degree of connectivity between a well screened within the Sonoma Volcanics and groundwater hydraulically connected to the Blossom Creek will depend on several factors: aquifer characteristics including the groundwater flow gradient, the depth of the screened interval compared to the channel elevation in the river, the spatial relationship between the well and channel, and the pumping regime of the well. The specific factors considered in the County guidance for assessing potential interaction between surface water and groundwater are identified as follows. The horizontal distance of Well 1 (1,450 ft) from the nearest point on Blossom Creek; note that there is a substantially greater distance on the likely groundwater flow path to Blossom Creek as previously discussed. The screened interval of Well 1 begins 100 ft bgs, which is approximately 30 ft below the bed of Blossom Creek. Well 1 also has a bentonite well seal to 20 ft bgs and a maximum pumping rate of 18 gpm.

Tier 3 WAA Criteria

The Tier 3 WAA guidance provides well set-back and construction standards that "if applicable would be expected to preclude any significant adverse effects on surface waters". Specifically, the "Tier 3 Groundwater Surface Water Interaction Criteria" section (pp. 10-13 of the Napa County guidance document dated May 12, 2015) states:

The groundwater/surface water criteria are presumptively met if the distance standards and project well construction assumptions are met (see Tables 3, 4, and 5). (p. 10)

These standards consider the planned pumping rate of the project well along with the well depth, screened interval, and seal depth along with aquifer hydraulic conductivity values and present acceptable distances based on specific combinations of all parameters. Tables 3, 4 and 5 in the Napa WAA guidance document present these distance standards and assumptions for wells constructed in unconsolidated (e.g. alluvium) aquifer materials and unconfined aquifers; these assumptions are intended primarily for wells in the Napa Valley Groundwater Basin. The project well is not in alluvium and lies outside the boundary of the NVGB.

The Tier 3 WAA guidance for wells drilled in bedrock in the "hillside zone" (All Other Areas excluding the MST aquifer in southeast Napa) is as follows:

*All Other Areas, will be subject to other distance standards based on site-specific aquifer conditions. Distance standards for project wells completed in consolidated formations will generally be no more restrictive than those shown in **Tables 3, 4, and 5** for hydraulic conductivity values of 0.5 ft/day. (p. 11)*

In other words, standards described in Tables 3, 4 and 5 for wells in bedrock aquifers are to be considered as wells with hydraulic conductivity values of 0.5 ft/day. As noted previously, Well 1 has a maximum pumping capacity of 18 gpm; as such, Well 1 is classified as a "Low Capacity" well (pumping rates between 10 and 30 gpm) as summarized in Table 4 below reproduced from the County guidance document.

Table 4. Well Distance Standards and Construction Assumptions; Low capacity pumping rates (i.e., between 10 gpm and 30 gpm), constructed in unconsolidated deposits in the upper part of the aquifer system (unconfined aquifer conditions).

Aquifer Hydraulic Conductivity (ft/day)	Acceptable Distance from Surface Water Channel			Minimum Surface Seal Depth (feet)	Depth of Uppermost Perforations (feet)
	500 feet	1000 feet	1500 feet		
80			✓	50	150
50			✓	50	150
30			✓	50	100
0.5		✓		50	100

Per Table 4 above, “Low Capacity” wells that are constructed in materials with a hydraulic conductivity of 0.5 ft/day and meet all construction standards, including a minimum seal depth of 50 ft and a minimum depth to uppermost perforations of 100 ft are not considered to have adverse effects on streamflow when located 1,000 ft or more from surface waters of concern. Well 1 meets all construction criteria except that it has a seal that extends only 20 ft bgs.

The well seal depth is not expected to have a significant influence on potential interaction between Well 1 and surface flows in Blossom Creek. The aquifer is believed to be confined, and groundwater elevation in Well 1 is greater than 50 ft bgs. There is no evidence of an unconfined aquifer near the ground surface around Well 1 that would be contiguous with any unconfined alluvial aquifer adjacent to and underlying Blossom Creek and hence no reason to suspect that the desired 50 ft depth of well seal would have a substantial influence on stream flow in Blossom Creek. Any potential connectivity between groundwater at the project well and Blossom Creek would exist at greater depth in the Sonoma Volcanics confined (or semi-confined) aquifer.

As noted above, several additional factors indicate that impacts of pumping related to the proposed project upon flows in Blossom Creek are not likely to be significant. Based on the preceding characterization of Blossom Creek as an intermittent stream that has a very short window of time where any hydraulic connection with groundwater exists and would most likely not coincide with periods of high demand, an intervening groundwater mound located between the project well and the creek that likely acts as a buffer to any pumping in Well 1 and portions of the aquifer to the east, a large horizontal separation between the well and Blossom Creek (1,450 ft) and the low permeability of the local bedrock, we do not expect that the proposed project will have a significant impact on flows in Blossom Creek.

Conclusion

Potential effects of groundwater use on streamflow in Blossom Creek were considered as required by Tier 3 WAA guidance. Tier 3 criteria state that for Well 1 to meet distance and construction standards it must be constructed 1,000 ft away from the water body in question and have a 50 ft deep sanitary seal and at least 100 ft to the first perforated casing. Well 1 is located over 1,000 ft from Blossom Creek (nearly 1,500 ft) and the depth to its uppermost perforations is 100 ft. However, Well 1 only has a surface seal that extends to 20 ft bgs, 30 ft short of the depth stated in Tier 3 criteria. Nevertheless, we believe that several factors exist that show that pumping of Well 1 will not impact flows in Blossom Creek. Modeled flows (per the Napa Valley Groundwater Basin GSP) in Blossom Creek are shown to have a short time window (2-13 weeks) where any hydraulic connection exists between the stream and adjacent alluvial aquifer. The time period of this connection also will most likely not overlap with periods of high demand. Based on that and the horizontal separation between Well 1 and Blossom Creek, as well as the apparent groundwater mound located under the intervening ridge between Well 1 and Blossom Creek and the low permeability of the local bedrock we do not expect the proposed project will have any significant impact to flows in Blossom Creek.

References

Graymer et al., 2007. Geologic Map and Map Database of Eastern Sonoma and Western Napa Counties, California. U.S. Geologic Survey Scientific Investigations Map 2956.

Luhdorff and Scalmanini Consulting Engineers (LSCE) and MBK Engineers, 2013. Updated hydrogeologic conceptualization and characterization of conditions. Prepared for Napa County.

Luhdorff and Scalmanini Consulting Engineers (LSCE), 2020. Napa County Groundwater Sustainability Agency Annual Report –Water Year 2020. Prepared for Napa County Groundwater Sustainability Agency and Napa County Department of Planning, Building, and Environmental Services.

Nishikawa, T. et al., 2013. Hydrologic and Geochemical Characterization of the Santa Rosa Plain Watershed, Sonoma County, California. Scientific Investigations Report 2013 – 5118 U.S. Department of the Interior U.S. Geological Survey.

APPENDIX A

Well Completion Reports

QUADRUPLICATE
For Local Requirements

Well 1

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

017-110-038

DWR USE ONLY - DO NOT FILL IN

STATE WELL NO./STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Page 1 of 1

Owner's Well No. 3422

No. 442577

Date Work Began 3-26-96, Ended 3-29-96

Local Permit Agency Napa

Permit No. 41519

Permit Date 3-4-96

GEOLOGIC LOG

WELL OWNER

ORIENTATION () ☒ VERTICAL ☐ HORIZONTAL ☐ ANGLE (SPECIFY)

DEPTH TO FIRST WATER (Ft.) BELOW SURFACE

DEPTH FROM SURFACE	Ft.	to	Ft.
--------------------	-----	----	-----

DESCRIPTION

Describe material, grain size, color, etc.

0	20	Topsoil/Brown Volcanic Rock
20	40	Gray Volcanic Rock
40	160	Gray & Brown Volcanic Rock
160	180	Red Volcanic Rock
180	200	Gray Volcanic Rock

Name Barbara Davies

Mailing Address 3455 Hwy. 128

Calistoga, CA 94515

QTY

WELL LOCATION

STATE

ZIP

Address 3455 Hwy. 128

City Calistoga, CA

County Napa

APN Book 017 Page 110 Parcel 033

Township Range Section

Latitude Longitude

DEG. MIN. SEC.

NORTH

DEG. MIN. SEC.

WEST

LOCATION SKETCH

NORTH

ACTIVITY ()

☒ NEW WELL

MODIFICATION/REPAIR

Deepen

Other (Specify)

DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S) ()

MONITORING

WATER SUPPLY

☒ Domestic

Public

Irrigation

Industrial

"TEST WELL"

CATHODIC PROTECTION OTHER (Specify)

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

DRILLING METHOD Rotary Mud

FLUID

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 60 (Ft.) & DATE MEASURED 3-27-96

ESTIMATED YIELD 50+ (GPM) & TEST TYPE air lift

TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN 140 (Ft.)

* May not be representative of a well's long-term yield.

TOTAL DEPTH OF BORING 200 (Feet)
TOTAL DEPTH OF COMPLETED WELL 200 (Feet)

DEPTH FROM SURFACE			BORE-HOLE DIA. (Inches)	CASING(S)					DEPTH FROM SURFACE			ANNULAR MATERIAL			
				TYPE ($\angle$)				MATERIAL/ GRADE				INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	TYPE
Ft.	to	Ft.		BLANK	SCREEN	CON- DUCTOR	FILL PIPE		CE- MENT ($\angle$)	BEN- TONITE ($\angle$)	FILL ($\angle$)				FILTER PACK (TYPE/SIZE)
0	205		10 5/8	X				F48PVC	5	200			X		
25	80		8 3/4	X				"	"	"				X	3/8 pea
80	100		7 7/8	X				"	"	"					
100	200		"		X			"	"	"	micro				

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.

FISCH BROS. DRILLING INC.

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

5001 GRAVENSTEIN HWY NO.

SEBASTOPOL CA. 95472

ADDRESS

CITY

STATE

ZIP

Signed

Steve Unterseher by c.l. hughes

3-28-96

399226

WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED

C-57 LICENSE NUMBER

QUADRUPLICATE
For Local Requirements

Page of

Owner's Well No. 41-110-37

Date Work Began 5-1-97 Ended 5-1-97

Local Permit Agency San Diego County

Permit No. 44107

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. **7475938**

17-110-050

DWR USE ONLY - DO NOT FILL IN

STATE WELL NO. / STATION NO. 17-110-050

LATITUDE 32° 41' 21" N LONGITUDE 117° 11' 00" W

APN/TRS/OTHER 17-110-37

GEOLOGIC LOG

ORIENTATION (°) VERTICAL 40 ANGLE (SPECIFY) 40

DEPTH TO FIRST WATER 40 (FL) BELOW SURFACE

DEPTH FROM SURFACE	DESCRIPTION
0 to 4	top soil
4 to 30	brown clay
30 to 52	brown ash
52 to 110	green, black & brown ash
110 to 160	green, brown & ash
160 to 180	green ash
180 to 250	brown, green & black ash
250 to 275	hard black rock
275 to 315	black & red ash
315 to 375	gray & black ash
375 to 390	hard brown clay with brown ash

TOTAL DEPTH OF BORING 390 (Feet)

TOTAL DEPTH OF COMPLETED WELL 390 (Feet)

WELL OWNER

Name Blossom Creek Vineyards

Mailing Address 13485

CITY San Diego STATE CA ZIP 92125

WELL LOCATION

Address 13485

City San Diego

County San Diego

APN Book 17-110-37 Page Parcel

Township Range Section

Latitude 32° 41' 21" N Longitude 117° 11' 00" W

LOCATION SKETCH

North South East West

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

ACTIVITY (°)

☒ NEW WELL

☐ MODIFICATION/REPAIR

☐ Deepen

☐ Other (Specify)

☐ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG")

PLANNED USE(S)

☐ MONITORING

WATER SUPPLY

☐ Domestic

☒ Public

☐ Irrigation

☐ Industrial

☐ "TEST WELL"

☐ CATHODIC PROTECTION

☐ OTHER (Specify)

DRILLING METHOD Rotary **FLUID** Mud

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC 15

WATER LEVEL 300 (Ft.) & DATE MEASURED 5-1-97

ESTIMATED YIELD 4 (GPM) & TEST TYPE 615 1.5 FT

TEST LENGTH 4 (Hrs.) TOTAL DRAWDOWN 360 (Ft.)

* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE		BORE-HOLE DIA. (Inches)	CASING(S)						DEPTH FROM SURFACE		ANNULAR MATERIAL			
Ft.	to Ft.		TYPE (°)	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	Ft.	to Ft.	CE-MENT (°)	BEN-TONITE (°)	FILL (°)	FILTER PACK (TYPE/SIZE)	
0	70	12.25	Blank	Plastic	8	200	Factory	0	22	✓			Red Grout	
70	390		Screen				1/32	22	390					

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 William Well Drilling

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

ADDRESS 2377 Piedmont Ave Napa CA 94558

CITY Napa STATE CA ZIP 94558

Signed Tom Palkin

WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED 4/25/11 C-57 LICENSE NUMBER 248677

017 120 024

ORIGINAL

File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY 27KDEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do not fill in

No. 095281

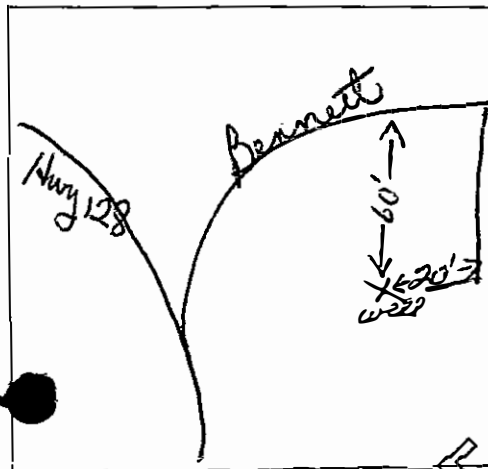
Permit No. or Date

State Well No.
Other Well No. 09N07W27

(2) LOCATION OF WELL (See instructions):

County: Napa Owner's Well Number 17-120-24
Well address if different from above Hwy. 128 & Bennett Rd.
Township Calistoga Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____(12) WELL LOG: Total depth 85 ft Depth of completed well 85 ft
from ft. to ft. Formation (Describe by color, character, size or material)

0	-	3	Topsoil
3	-	32	Soft Brn. clay
32	-	78	White & orange soft rock
78	-	85	Soft grey ash



WELL LOCATION SKETCH

(3) TYPE OF WORK:

New Well ☒ Deepening ☐
 Reconstruction ☐
 Reconditioning ☐
 Horizontal Well ☐

Destruction ☐ (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:

Domestic ☒
 Irrigation ☐
 Industrial ☐
 Test Well ☐
 Stock ☐
 Municipal ☐
 Other ☐

(5) EQUIPMENT:

Rotary ☒ Reverse ☐
 Cable ☐ Air ☐
 Other ☐ Bucket ☐

(6) GRAVEL PACK:

Yes ☒ No ☐ Size 3/4
 Diameter of bore 12 1/4
 Packed from 22 to 85

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS: Power saw

Type of perforation nr size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	85	6	160	35	85	4x3

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 20 ft.
 Were strata sealed against pollution? Yes ☐ No ☒ Interval _____ ft.
 Method of sealing Grout

(10) WATER LEVELS:

Depth of first water, if known 78 ft.
 Standing level after well completion 24 ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? driller
 Type of test Pump ☐ Bailer ☒ Air lift ☐
 Depth to water at start of test 25 ft. At end of test 85 ft.
 Discharge 5 gal/min after _____ hours Water temperature _____

Local analysis made? Yes ☐ No ☒ If yes, by whom? _____
 Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

Work started 11-19 1980 Completed 11-19 1980

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

SIGNED J. S. Doshier (Well Driller)NAME Doshier-Gregson Drilling, Inc.

(Person, firm, or corporation) (Typed or printed)

Address 5365 Napa-Vallejo Hwy.City VallejoZip 94590License No. 294001Date of this report 11/20/80

Well 5

ORIGINAL

File Original, Duplicate and Triplicate with the

REGIONAL WATER POLLUTION

CONTROL BOARD No. _____

(If appropriate number)

WATER WELL DRILLERS REPORT

(Sections 7076, 7077, 7078, Water Code)

370

THE RESOURCES AGENCY OF CALIFORNIA

Do Not Fill In

Nº 103228

State Well No. _____

Other Well No. 917-27

(2) LOCATION OF WELL:

County Napa Owner's number, if any—R. F. D. or Street No. 3514-Hwy. 128Approx. 2 mi. Northerly
of Calistoga, known as
Holiday House Inn.

(3) TYPE OF WORK (check):

New well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☒ Industrial ☐ Municipal ☐Irrigation ☐ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐Cable ☒Dug Well ☐

(6) CASING INSTALLED:

SINGLE ☒ DOUBLE ☐From 0 ft. to 118 ft. 8 Diam. 188 Gage

Wall

" " " " " "

" " " " " "

" " " " " "

" " " " " "

" " " " " "

Type and size of shoe or well ring 3 1/2 x 6 x 8Describe joint Butt weld.

If gravel packed

Diameter of Bore from to

ft. ft. ft.

" " " "

" " " "

" " " "

" " " "

" " " "

Size of gravel:

(7) PERFORATIONS:

Type of perforator used None

Size of perforations in., length, by in.

From ft. to ft. Perf. per row Rows per ft.

" " " " " " " "

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(8) CONSTRUCTION:

Was a surface sanitary seal provided? ☒ Yes ☐ No To what depth 60 ft.Were any strata sealed against pollution? ☒ Yes ☐ No If yes, note depth of strataFrom 4 ft. to 12 ft.

" " " " " "

Method of Sealing Cement Grout

(9) WATER LEVELS:

Depth at which water was first found 145 ft.

Standing level before perforating ft.

Rising level after perforating 20 ft.(10) WELL TESTS: 700 gal per Hr @ 35 ft.Was a pump test made? ☐ Yes ☒ No If yes, by whom? BailerYield: 45 gal./min. with 15 ft. draw down after 1 hr.Temperature of water Was a chemical analysis made? ☐ Yes ☒ NoWas electric log made of well? ☐ Yes ☒ No

(11) WELL LOG:

Total depth 154 ft. Depth of completed well ft.

Formation: Describe by color, character, size of material, and structure.

0 ft. to 4 ft. Topsoil

" " " " " "

4 " 12 " Gravel

" " " " " "

12 " 70 " Hard yellow clay &" " " " stone70 " 77 " Hard blue volcanic" " " " ash.77 " 92 " Gray ash

" " " " " "

92 " 95 " Broken rock

" " " " " "

95 " 115 " Blue rock

" " " " " "

115 " 118 " Black Basalt

" " " " " "

118 " 142 " Hard blue ash.

" " " " " "

142 " 154 " Black volcanic" " " " rock.

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FOR OFFICIAL USE ONLY

Work started April 25 1966 Completed May 3 1966

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Walter Rottler

(Person, firm, or corporation) (Typed or printed)

Address 1541 Mark West Ave. RedArta, Reno, Calif.[SIGNED] Walter Rottler

Well Driller

License No. 163052 Dated May 5 1966

ORIGINAL
File with DWR

Well 6

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

Page ____ of ____

Owner's Well No. _____

No. 0992228

Date Work Began _____

Local Permit Agency _____

Permit No. _____

Permit Date _____

R. 10/14/16
DWR USE ONLY - DO NOT FILL IN
019N107W128
STATE WELL NO. STATION NO.
5831620 11223745
LATITUDE LONGITUDE
APN/TRS OTHER

GEOLOGIC LOG

ORIENTATION () ☒ VERTICAL ☐ HORIZONTAL ☐ ANGLE (SPECIFY)
DRILLING METHOD rotary FLUID air/mu

DEPTH FROM SURFACE _____

Describe material grain size, color, etc.

0 80 brown ash & rock

80 360 green ash, streaks

of gray sandstone

360 400 gray ash, streaks

of broken up gray

sandstone

400 480 gray stick clay

ash

Address 3610 Hwy 128

City Calistoga

County Napa

APN Book _____ Page _____ Parcel 017-120-050

Township _____ Range _____ Section _____

Lat _____ DEG MIN SEC Long _____ DEG MIN SEC

LOCATION SKETCH NORTH

WEST EAST

Illustrate or Describe Distance of Well from Roads, Buildings, Etc., and attach a map, if additional paper is used. PLEASE BE ACCURATE & COMPLETE.

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) _____

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 60 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 55 (Ft.) & DATE MEASURED 1-6-16

ESTIMATED YIELD 100 (GPM) & TEST TYPE AIR LEAK

TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN 500 (Ft.)

* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE			BORE-HOLE DIA. (inches)	CASING (S)						DEPTH FROM SURFACE			ANNULAR MATERIAL			
				TYPE ()				MATERIAL GRADE	INTERNAL DIAMETER (Inches)				GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	TYPE	
Ft.	to	Ft.	BLANK	SCREEN	CON- DUCTOR	FILL PIPE										CE- MENT ()
0	47	11"	X				PLASTIC	5"	200		0	47	X			
47	60	9"	X				"	"	"		47	475				WELL PACK #6
60	475	9'					EXT PREP "	"	"	3/22						

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 William Wells Drilling

PERSON, FIRM OR CORPORATION (TYPE OR PRINTED)

ADDRESS 2877 Piedmont Av. Napa

CITY CA STATE CA ZIP 94558

Signer William Wells DATE SIGNED 1-6-16 LICENSE NUMBER 248677

LICENSED WATER WELL CONTRACTOR

File with DWR

Well 7

STATE OF CALIFORNIA *OSWCR*
WELL COMPLETION REPORT
 Refer to Instruction Pamphlet

No. 0999596

DWR USE ONLY — DO NOT FILL IN

09 N 07 W 27

STATE WELL NO./STATION NO.

38 36 15 1 22 37 16

LATITUDE LONGITUDE

91 71 20 04 7

APN/TRS/OTHER

Page of

Owner's Well No.

Date Work Began

Local Permit

Permit No.

Permit Date

GEOLOGIC LOG

ORIENTATION (°)

VERTICAL

HORIZONTAL

ANGLE

(SPECIFY)

DRILLING METHOD

rotary

FLUID

air & mud

DEPTH FROM SURFACE

DESCRIPTION

Describe material, grain size, color, etc.

0-80 brown shale & rock
 80-88.5 grayish streaks
 of gray sandstone
 88.5-140 blue oil shale

Address

City

County

APN Book

Page

Parcel

Township

Range

Section

Lat.

DEG

MIN

SEC

N

Long

DEG

MIN

SEC

W

LOCATION SKETCH

NORTH



Illustrate or Describe Distances of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (°)

NEW WELL

MODIFICATION/REPAIR

Deepen

Other (Specify)

DESTROY (Describe

Procedures and Materials

Under "GEOLOGIC LOG")

USES (°)

WATER SUPPLY

Domestic

Irrigation

Public

Industrial

MONITORING

TEST WELL

CATHODIC PROTECTION

HEAT EXCHANGE

DIRECT PUSH

INJECTION

VAPOR EXTRACTION

SPARGING

REMEDICATION

OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 80 (Ft) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 70' (Ft) & DATE MEASURED 9-28-18

ESTIMATED YIELD 15 (GPM) & TEST TYPE AIR LEFT

TEST LENGTH 2 (Hrs) TOTAL DRAWDOWN 280 (Ft)

* May not be representative of a well's long-term yield.

TOTAL DEPTH OF BORING 440 (Feet)

TOTAL DEPTH OF COMPLETED WELL 396 (Feet)

DEPTH FROM SURFACE			BORE-HOLE DIA. (Inches)	CASING (S)					DEPTH FROM SURFACE			ANNULAR MATERIAL						
				TYPE (✓)				MATERIAL / GRADE				INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	TYPE			
FL	to	Ft.	BLANK	SCREEN	CON- DUCTOR	FILL PIPE									FL	to	Ft.	CE- MENT (✓)
0	53		11"	X				PLASTIC	5"	200			53		K			
53	76		9"	X				"	"	"			53	396				WELL PACK #6
76	396		9"	FACT				PREF "	"	"								

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 Drilling*

PERSON, FIRM, OR CORPORATION (TYPED OR PRINTED)

ADDRESS *2877 Piedmont Av. Napa, CA 94558*CITY *Napa* STATE *CA* ZIP *94558*Signed *Bill Pulliam* DATE SIGNED *10-23-18* LICENSE NUMBER *18248677*

C-57 LICENSED WATER WELL CONTRACTOR

ORIGINAL
File with DWR

Well 8

STATE OF CALIFORNIA
WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 1073648

DWR USE ONLY - DO NOT FILL IN

09N07W27

STATE WELL NO./STATION NO.

383555 1223734

LATITUDE LONGITUDE

APN/TRS/OTHER

Page ___ of ___

Owner's Well No. _____

Date Work Began 12/13/2007, Ended 12/22/2007

Local Permit Agency Napa County

Permit No. E07-00841

Permit Date 11/13/2007

GEOLOGIC LOG

ORIENTATION ()		XX VERTICAL	HORIZONTAL	ANGLE	(SPECIFY)
DEPTH FROM SURFACE		DRILLING METHOD	Rotary	FLUID	Air/mud
Ft.	to Ft.	DESCRIPTION			
Describe material, grain size, color, etc.					
0	60	Brown Tuffa & Gray Rock			
60	200	Gray & Brown Volcanic Rock			
200	225	Brown & Red Ash			
225	315	Yellow & Brown Soft Ash			
315	385	Red Clay with Hard Gray Rock			
385	430	Hard Gray Volcanic Rock			
Well Development					
160 GPM at 220 Ft.					
160 GPM at 280 Ft.					
160 GPM at 340 Ft.					
160 GPM at 420 Ft.					

Na _____

Ma _____

CITY _____

Address 3475 Highway 128

City Calistoga

County Napa

APN Book 017 Page 110 Parcel 049-000

Township _____ Range _____ Section _____

Lat _____ N Long _____ W

DEG. MIN. SEC. DEG. MIN. SEC.

LOCATION SKETCH

NORTH

Driveway

801 ft

BURNETT

SOUTH

WEST

EAST

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

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

REMEDICATION

OTHER (SPECIFY)

TOTAL DEPTH OF BORING 430 (Feet)

TOTAL DEPTH OF COMPLETED WELL 425 (Feet)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 80 (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 50 (Ft.) & DATE MEASURED 12-21-07

ESTIMATED YIELD 160 (GPM) & TEST TYPE Air Lift

TEST LENGTH 5 (Hrs.) TOTAL DRAWDOWN 44 (Ft.)

* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE		BORE-HOLE DIA. (Inches)	CASING (S)				SLOT SIZE IF ANY (Inches)	ANNULAR MATERIAL				
Ft.	to Ft.		TYPE ()					TYPE				
Ft.	to Ft.	BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	CE-MENT ()	BEN-TONITE ()	FILL ()	FILTER PACK (TYPE/SIZE)
0	54	14	✓			Plastic	8	F480	✓			
54	105	12 1/4	✓			✓	✓	✓				
105	425	12 1/4	✓			✓	✓	✓				Well Pack 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 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

C-57 LICENSE NUMBER 808-508

DWR USE ONLY - DO NOT FILL IN

017-110-045

STATE WELL NO. STATION NO.

LATITUDE LONGITUDE

APN/RS/OTHER

Page ___ of ___

Owner's Well No.

Date Work Began

Local Permit Agency

Permit No.

Permit Date

No. 710265

GEOLOGIC LOG

ORIENTATION (±) ☒ VERTICAL ☐ HORIZONTAL ☐ ANGLE (SPECIFY)

DRILLING METHOD rotary FLUID air

DEPTH FROM SURFACE

DESCRIPTION

Describe material, grain size, color, etc.

0-25 brown clay

25-45 black ash

45-130 brown & black ash

130-195 gray & black rock

195-200 brown & black ash

200

TOTAL DEPTH OF BORING 200 (Feet)

TOTAL DEPTH OF COMPLETED WELL 200 (Feet)

WELL OWNER

Name Barbara Davies

Mailing Address 3447 Highway 128

City Calistoga STATE CA

WELL LOCATION

Address Same

City Same

County Napa

APN Book 017-110-04 Page 95 Parcel 017-110-04

Township Range Section 95

Latitude DEG MIN SEC NORTH Longitude DEG MIN SEC WEST

LOCATION SKETCH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER uk (Feet) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 21 (Feet) & DATE MEASURED 4-18-01

ESTIMATED YIELD 80+ (GPM) & TEST TYPE air lift

TEST LENGTH 171.5 (Hrs.) TOTAL DRAWDOWN 171.5 (Feet)

* May not be representative of a well's long-term yield.

DEPTH FROM SURFACE		BORE-HOLE DIA. (Inches)	CASING (S)				ANNULAR MATERIAL								
Feet	to		TYPE (±)	MATERIAL GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	DEPTH FROM SURFACE	TYPE						
0	23	10 3/4	✓	Plastic	5	200		0	23	CEMENT	✓				
23	80	8 3/4	✓	"	"	"	"								
80	200	8 3/4	✓	"	"	"	"	23	200						

ATTACHMENTS (±)

☐ Geologic Log

☐ Well Construction Diagram

☐ Geophysical Log(s)

☐ Soil/Water Chemical Analysis

☐ 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 Drilling

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

ADDRESS 2277 Piedmont

CITY Napa STATE CA

Signed Tom Pulliam

DATE SIGNED 5-2-01

WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED 5-2-01

WELL DRILLER/AUTHORIZED REPRESENTATIVE

Well 9

STATE OF CALIFORNIA

WELL COMPLETION REPORT

No. 710691

OWNER'S WELL No. 4424

Date Work Began 2/14/01 Ended 2/20/01

Local Permit Agency Napa

Permit No. 96-11473

Permit Date 5-10-2000

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO. STATION NO.

LATITUDE LONGITUDE

APN / TRS / OTHER

GEOLOGIC LOG

WELL OWNER

ORIENTATION	Vertical	Degree of Angle	Barbara Davies
DEPTH FROM SURFACE	DEPTH TO FIRST WATER	(ft.) BELOW SURFACE	3455 Hwy. 128
Ft.	Ft.	DESCRIPTION	Calistoga
0	90	yellow ash	CA 95472
90	120	blue volcanic rock & ash	
120	160	yellow ash	
160	190	light blue volcanic rock & ash	
190	210	light blue volcanic rock	
210	230	red volcanic rock	
230	260	light grey volcanic ash & rock	
260	270	red volcanic rock	
270	300	light grey ash & rock	
300	320	dark grey volcanic ash	
320	360	green ash	
360	460	grey volcanic rock & ash	

Address same as above
 City _____ County Napa
 Apn Book 017 Page 110 Parcel 42
 or
 Township _____ Range _____ Section 1/4 1/4
 or
 Latitude _____ NORTH Longitude _____ WEST
 Deg. Min. Sec. _____ Deg. Min. Sec. _____

LOCATION SKETCH

RECEIVED

FEB 28 2001

DEPT. OF
ENVIRONMENTAL MANAGEMENT

ACTIVITY NEW WELL PLANNED USE(S) Irrigation Water
 DRILLING METHOD ROTARY MUD FLUID
 DEPTH OF STATIC WATER LEVEL 5 (Ft.) & DATE MEASURED Feb. 19, 2001
 ESTIMATED YIELD* 90 (G.P.M.) & TEST TYPE Air Lift
 TEST LENGTH 2 (Hrs.) TOTAL DRAWDOWN 140 (FT.)
 *May not be representative of a well's long-term yield.

casing continued:
 360 450 12.25 perfs f480 pvc 8" 200 factory

TOTAL DEPTH OF BORING 450 (Feet)

TOTAL DEPTH OF COMPLETED WELL 450 (Feet)

CASING									ANNULAR MATERIAL			
DEPTH FROM SURFACE		BORE-HOLE		TYPE	Material / Grade	Dia.	Gauge	Slot size	FROM SURFACE		Seal Material	Filter Pack (Type / Size)
Ft.	To Ft.	Ft.	DIA.						Ft.	To Ft.		
0	50	15		Blank	F480 PVC	8	200		0	28	Bentonite	
50	100	12.25		Blank	F480 PVC	8	200		28	450	Gravel	
100	140	12.25		Perfs	F480 PVC	8	200	Factory			1/4 X 1/8	
140	160	12.25		Blank	F480 PVC	8	200					
160	340	12.25		Perfs	F480 PVC	8	200	Factory				
340	360	12.25		Blank	F480 PVC	8	200					

Attachments

- ...no... Geologic Log
- ...no... Well Construction Diagram
- ...no... Geophysical Logs
- ...no... Soil Water Chemical Analyses
- ...no... Other

CERTIFICATION STATEMENT

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

NAME Fisch Bros. Drilling, Inc.
 (PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
 5001 Gravenstein Hwy No. Sebastopol CA 95472

Signed Steve Unterseher Carol Hughes 2-21-01 399226
 WELL DRILLER / AUTHORIZED REPRESENTATIVE DATE SIGNED C- 57 LICENSE NUMBER

Well 10

AP #17-160-18119

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
WATER WELL DRILLERS REPORT

Do Not Fill In

No 74700

ORIGINAL
File with DWR

State Well No. _____

Other Well No. _____

(1) OWNER:

Name Ben Sharpsteen
Address 3381 Hwy. 128
Calistoga, Calif.

(2) LOCATION OF WELL:

County Napa (Owner's number, if any)
Township, Range, and Section:
Distance from cities, roads, railroads, etc. Same

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☒
Cable ☐
Other ☐

(6) CASING INSTALLED:

STEEL: X OTHER:
SINGLE ☒ DOUBLE ☐

If gravel packed

From ft.	To ft.	Diam. in.	Gauge or Wall	Diameter of Bore in.	From ft.	To ft.
0	250	65/8"	10GA	105/8"	0	20
				97/8"	20	250

Size of shoe or well casing:

Size of gravel: Pea

Describe joint: Welded

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen: Torch

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
70	90	1	1/4	3/16 x 6
110	130	1	1/4	1/16 x 6
150	210	1	1/4	1/16 x 6
230	250	1	1/4	1/16 x 6

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth: 20 ft.

Were any strata sealed against pollution? Yes ☐ No ☐ If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing: Neat Cement on Pack

(9) WATER LEVELS:

Depth at which water was first found, if known ft.

Standing level before perforating, if known ft.

Standing level after perforating and development 100 ft.

(10) WELL TESTS:

Was pump test made? Yes ☐ No ☒ If yes, by whom? Boil

Yield: 20 gal./min. with 110 ft. drawdown after hrs.

Temperature of water Cool Was a chemical analysis made? Yes ☐ No ☐

Was electric log made of well? Yes ☐ No ☒ If yes, attach report

(11) WELL LOG:

Total depth 250 ft. Depth of completed well 250 ft.

Formation: Describe by color, character, size of material, and structure

ft. to	ft.
0 - 12	Volcanic ash
12 - 32	Conglomerate multi-colored volcanic rock
32 - 72	Same, but fractured
72 - 131	Conglomerate fractured volcanic rock
131 - 134	Yellow ash, dry
134 - 140	Fractured rock
140 - 149	Conglomerate volcanics
149 - 151	Volcanic rock
151 - 156	Fractured volcanics
156 - 158	Volcanic rock
158 - 160	Volcanic rock
160 - 190	Conglomerate volcanics
190 - 212	Black volcanic rock (poros)
212 - 230	Conglomerate volcanics & ashes
230 - 236	Blue clayee ash
236 - 250	Conglomerate blue volcanics & ash

RECEIVED

JUL 12 1973

HUMAN SERVICES AGENCY

ENVIRONMENTAL QUALITY CONTROL

Work started 6-20-73 Completed 7-3-73

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Weeks Drilling & Pump Co.
(Person, firm, or corporation) (Typed or printed)

Address 6100 Sebastopol Road
Sebastopol, Calif. 95472

(SIGNED) Gerald C. Thompson

By Mary E. Thompson

License No. C-57-177681 Dated July 7, 1973

SKETCH LOCATION OF WELL ON REVERSE SIDE

CONFIDENTIAL LOG
Water Code Sec. 13752THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

State Well No.

Other Well No.

017-170-026

09N07W27

11) WELL LOG:

Total depth 158 ft. Depth of completed well ft.

Formation: Describe by color, character, size of material, and structure

0 - 1 Topsoil ft.

1 - 18 Gray Clay & boulders

18 - 24 Brown ash & boulders

24 - 30 Gray ash

30 - 55 Blue clay & ash

55 - 81 Gray clay & stone

81 - 96 Dry broken rock & Brown clay

96 - 115 Soft gray ash

115 - 124 Brown ash

124 - 126 Boulders

126 - 146 Blue clay & ash

146 - 147 Water gravel

147 - 150 Black broken rock

150 - 158 Blue sand & gravel

(2) LOCATION OF WELL:

County Napa Owner's number, if any

Township, Range, and Section 3327 Healdsburg

Distance from cities, roads, railroads, etc. 1/2 mi. NW

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☒ Industrial ☐ Municipal ☐Irrigation ☐ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐Cable ☒Other ☐

(6) CASING INSTALLED:

STEEL ☒ OTHER: ☐SINGLE ☒ DOUBLE ☐

If gravel packed

From ft.	To ft.	Diam.	Gage Wall	Diameter of Bore	From ft.	To ft.
0	158	8	188			

If shoe or well ring: 7x6x8 Size of gravel:

Describe joint: Rust weld.

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen Machine-sawed

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
146	158	2	10	1/2 x 3

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 65 ft.Were any strata sealed against pollution? Yes ☐ No ☒ If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing Cement Grout

(9) WATER LEVELS:

Depth at which water was first found, if known ft. 146

Standing level before perforating, if known ft.

Standing level after perforating and developing ft. 50

(10) WELL TESTS:

Pump test made? Yes ☒ No ☐ If yes, by whom? Driller

Flow: 20 gal./min. with 40 ft. drawdown after 1 hrs.

Temperature of water Was a chemical analysis made? Yes ☐ No ☒Electric log made of well? Yes ☐ No ☒ If yes, attach copy

Work started Sept 18 69, Completed Sept 24 69

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME

1541 Mark West Blvd.

Address

[SIGNED]

Walter Pittella

License No.

163052

Dated

Sept 25 69

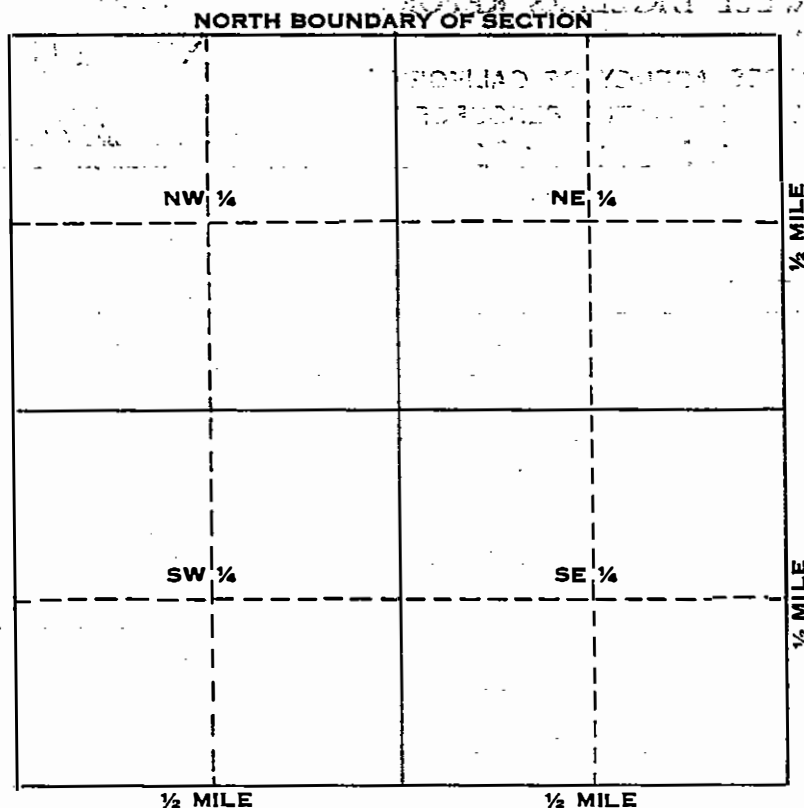
SKETCH LOCATION OF WELL ON REVERSE SIDE

Well 11

WELL LOCATION SKETCH

No 11079

12510120
a 7/10 11/10 11/10

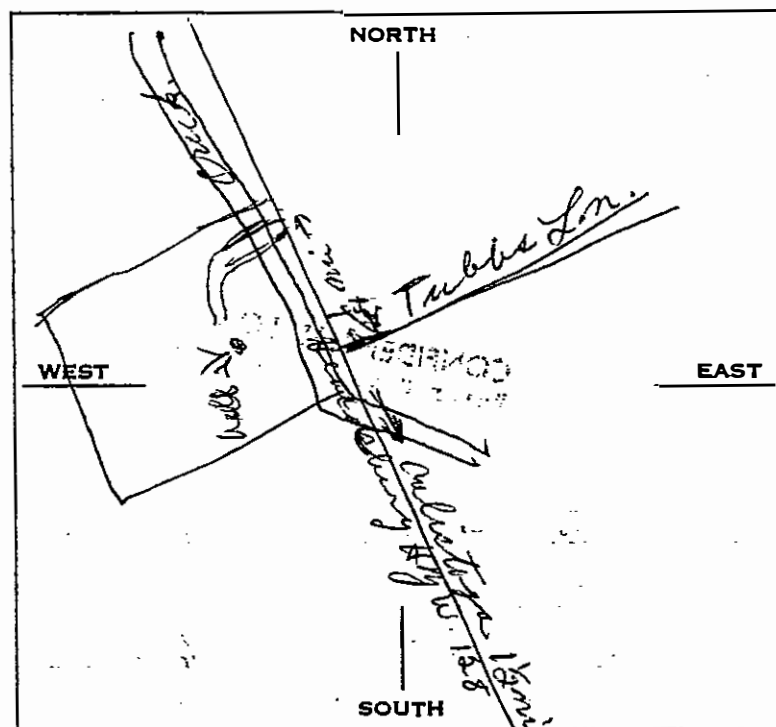


Township _____ N/S

Range _____ E/W

Section No. _____

- A. Location of well in sectionized areas.
Sketch roads, railroads, streams, or other features as necessary.



- B. Location of well in areas not sectionized.
Sketch roads, railroads, streams, or other features as necessary.
Indicate distances.

1969 SEP 29 AM 11 32

DEPT. OF WATER
RESOURCES

Well 12

017 170 006

STATE OF CALIFORNIA
THE RESOURCES AGENCY

Do Not Fill In

ORIGINAL

File with DWG

CONFIDENTIAL LOG DEPARTMENT OF WATER RESOURCES

Water Code Sec. 13752

WATER WELL DRILLERS REPORT

No 143898

State Well No.

Other Well No. 9N-17W-27

(2) LOCATION OF WELL:

County Merced Owner's number, if any

Township, Range, and section

Distance from cities, roads, railroads, etc.

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐

If destruction, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☒ Industrial ☐ Municipal ☐Irrigation ☐ Test Well ☐ Other ☐

(5) EQUIPMENT:

Rotary ☐Cable ☒Other ☐

(6) CASING INSTALLED:

STEEL:

OTHER:

SINGLE ☒DOUBLE ☐

If gravel packed

From ft.	To ft.	Diam. in.	Gage or Wall ft.	Diameter of Bore in.	From ft.	To ft.
0	120	18	18			

Shoe or well ring:

Size of gravel:

Describe joint

(7) PERFORATIONS OR SCREEN:

Type of perforation or name of screen

From ft.	To ft.	Perf. per row	Rows per ft.	Size in. x in.
40	120	3	10	8x3

(8) CONSTRUCTION:

Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 22 ft.Were any strata sealed against pollution? Yes ☐ No ☐ If yes, note depth of strata

From ft. to ft.

From ft. to ft.

Method of sealing

(9) WATER LEVELS:

Depth at which water was first found, if known ft. 22Standing level before perforating, if known ft. 25Standing level after perforating and developing ft. 25

(10) WELL TESTS:

Was pump test made? Yes ☒ No ☐ If yes, by whom DrillerRate of flow gal./min. with 60 ft. drawdown after 1 hrs.Temperature of water Was a chemical analysis made? Yes ☐ No ☒Electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:

Total depth 120 ft. Depth of completed well ft.

Formation: Describe by color, character, size of material, and structure

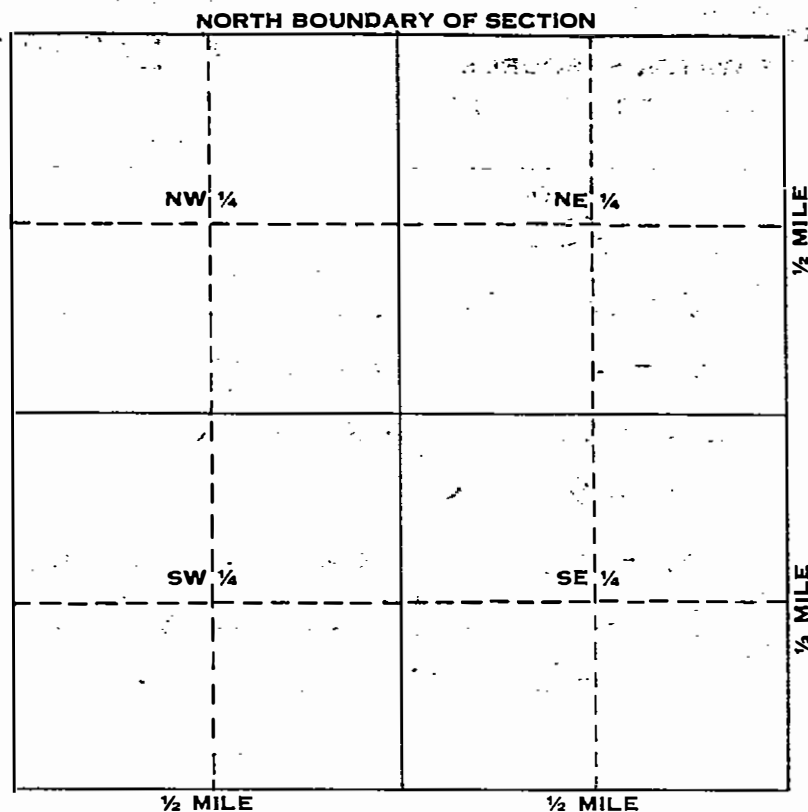
0-3 Top soil ft.3-22 Drum clay ft.22-30 Hard dense sandstone ft.30-41 Hard clay ft.41-87 Blue clay gravel ft.87-108 Blue ash ft.108-120 Layer of ash & gravel ft.

SKETCH LOCATION OF WELL ON REVERSE SIDE

Well 12

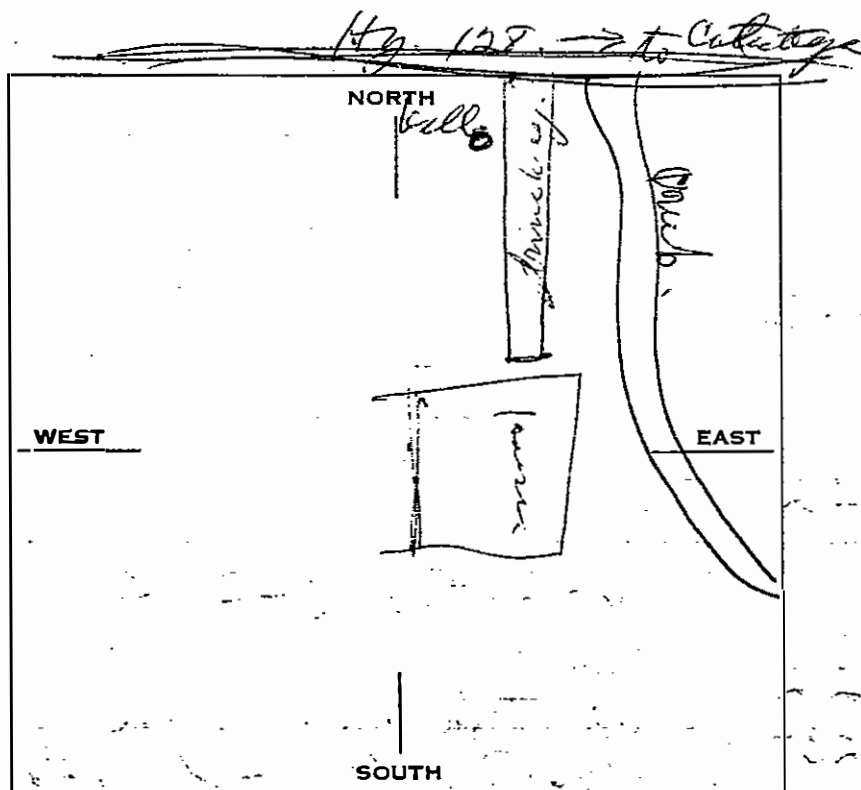
WELL LOCATION SKETCH

No 143898



Township 9 N/S
 Range 7 E/W
 Section No. 27

- A. Location of well in sectionized areas.
 Sketch roads, railroads, streams, or other features as necessary.



- B. Location of well in areas not sectionized.
 Sketch roads, railroads, streams, or other features as necessary.
 Indicate distances.

File Original with DWR

State of California

Well Completion Report

Page 1 of 1

Owner's Well Number Well #2No. e0368760Date Work Began 05/31/2018Date Work Ended 6/11/2018Local Permit Agency Napa County Environmental Health ServicesPermit Number E18-00054Permit Date 1/29/18

DWR Use Only - Do Not Fill In

State Well Number/Site Number

Latitude

Longitude

APN/TRS/Other

Geologic Log

Orientation ☒ Vertical ☐ Horizontal ☐ Angle Specify _____Drilling Method Direct RotaryDrilling Fluid Jel

Depth from Surface

Description

Feet to Feet Describe material, grain size, color, etc

0	18	Rocky brown soil
18	32	Loose gravel
32	36	Brown clay
36	70	Sandy gravel
70	79	Brown clay
79	128	Cemented gravel with rocks
128	150	Stiff clay
150	154	Cemented gravel
154	156	Clay
156	162	Cemented gravel
162	194	Clay
194	200	Cemented gravel
200	207	Clay
207	220	Hard rock basalt

Total Depth of Boring 220 FeetTotal Depth of Completed Well 202 Feet

Well Owner

Name Dennis PenceMailing Address 11053 N Boyer RoadCity Sandpoint State ID Zip 83864

Well Location

Address 3281 State Highway 128City Calistoga County NapaLatitude 38 35 36 N Longitude 122 36 52 W
Dec Min Sec Dec Min Sec

Datum _____ Decimal Lat. _____ Decimal Long _____

APN Book 017 Page 170 Parcel 005Township 9N Range 7W Section 27

Location Sketch

(Sketch must be drawn by hand after form is printed)

North

West

East

South

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

- ☒ New Well
☐ Modification/Repair
☐ Deepen
☐ Other _____
☐ Destroy
 Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

- ☒ Water Supply
☒ Domestic ☐ Public
☒ Irrigation ☐ Industrial
☐ Cathodic Protection
☐ Dewatering
☐ Heat Exchange
☐ Injection
☐ Monitoring
☐ Remediation
☐ Sparging
☐ Test Well
☐ Vapor Extraction
☐ Other _____

Water Level and Yield of Completed Well

Depth to first water _____ (Feet below surface)

Depth to Static _____

Water Level 23 (Feet) Date Measured 06/11/2018Estimated Yield * 10 (GPM) Test Type Air LiftTest Length 2.0 (Hours) Total Drawdown 200 (Feet)

*May not be representative of a well's long term yield

Casings

Depth from Surface Feet to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	20	11					
20	220	8					
0	102		Blank	PVC Sch 40	SDR21	5	
102	202		Screen	PVC Sch 40	SDR21	5	Milled Slots 0.032

Annular Material

Depth from Surface Feet to Feet	Fill	Description
0	20	Cement
20	202	Filter Pack #6 Sand
202	220	Fill Native

Attachments

- ☐ Geologic Log
☐ Well Construction Diagram
☐ Geophysical Log(s)
☐ Soil/Water Chemical Analyses
☒ Other Site Map

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 Weeks Drilling & Pump Company

Person, Firm or Corporation

P.O. Box 176

Address

City Sebastopol

City

State CA Zip 95473

State

Zip

Signed _____

Date Signed 7/18/18

177681

C-57 Licensed Water Well Contractor

C-57 License Number

File Original with DWR

State of California

Page 1 of 1

Well 14

Well Completion Report

Refer to Instruction Pamphlet

No. e0197525

Owner's Well Number

Date Work Began 10/30/2013

Date Work Ended 10/30/2013

Local Permit Agency Napa County Environmental Management

Permit Number E13-00677

Permit Date 10/18/13

DWR Use Only - Do Not Fill In

State Well Number/Site Number

Latitude

Longitude

APN/TRS/Other

Geologic Log

Orientation ☒ Vertical ☐ Horizontal ☐ Angle Specify

Drilling Method Drilling Fluid

Depth from Surface

Description

Feet to Feet

Describe material, grain size, color, etc

35 30 Bentonite Grout

30 4 Concrete

4 0 Topsoil

RECEIVED

Napa County Planning, Building & Environmental Services

Well Owner

Name Teresa S Butler

Mailing Address 3281 Highway 128

City Calistoga State CA Zip 94515

Well Location

Address 3283 Highway 128

City Calistoga County Napa

Latitude Dec. Min. Sec. N Longitude Dec. Min. Sec. W

Datum Dec. Lat. Dec. Long.

APN Book 017 Page 170 Parcel 005

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)

North



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

- ☐ New Well
- ☐ Modification/Repair
 - ☐ Deepen
 - ☐ Other
- ☒ Destroy
 - Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

- ☐ Water Supply
 - ☐ Domestic ☐ Public
 - ☐ Irrigation ☐ Industrial
- ☐ Cathodic Protection
- ☐ Dewatering
- ☐ Heat Exchange
- ☐ Injection
- ☐ Monitoring
- ☐ Remediation
- ☐ Sparging
- ☐ Test Well
- ☐ Vapor Extraction
- ☐ Other

Water Level and Yield of Completed Well

Depth to first water (Feet below surface)

Depth to Static

Water Level (Feet) Date Measured

Estimated Yield * (GPM) Test Type

Test Length (Hours) Total Drawdown (Feet)

*May not be representative of a well's long term yield.

Casings

Depth from Surface Feet to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)

Annular Material

Depth from Surface Feet to Feet	Fill	Description

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 McLean and Williams, Inc.

Person, Firm or Corporation

878 El Centro Avenue

Address

Napa

City

CA

State

94558

Zip

Signed

[Signature]

C-57 Licensed Water Well Contractor

11-29-13

Date Signed

396352

C-57 License Number