



REVISED MEMORANDUM

July 8, 2025

RCS Job No. 821-NPA01

To: A & B Vineyards LLC
c/o Mr. Steve Contursi
Sent via email: steve@arrowandbranch.com

CC: Mr. Mike Muelrath of Applied Civil Engineering
Sent via email: mike@appliedcivil.com
&
Ms. Donna Olford of Plans4Wine
Sent via email: dboldford@aol.com

From: Anthony Hicke and Edward Linden
Richard C. Slade & Associates LLC (RCS)

Re: Revised Results of Tier 3 Napa County Water Availability Analysis for a
Winery Use Permit Modification at the A & B Vineyards Property
Napa County APN 034-190-040
5125 Solano Avenue, Napa County, CA

Executive Summary

Arrow & Branch Vineyards is applying for a Winery Use Permit Modification for the subject property, and a Tier 3 Water Availability Analysis (WAA) is required for the proposed project. A Tier 3 WAA is required because the subject project is supplied with groundwater from a well (the Project Well) that is within 1,500 feet of a portion of Dry Creek that has been identified by the County as a "Significant Stream". Napa County personnel have also requested that the subject Tier 3 WAA also consider the onsite Easement Well. Groundwater accessible to the Project Well and the Easement Well is not hydraulically connected to the proximal portion of Dry Creek. This lack of connection is demonstrated by several factors, including:

- Recent available groundwater depth measurements in the Project Well and the Easement Well have been much lower in elevation than the bed elevation of Dry Creek near these wells, despite water in the Creek frequently being present.
- The Project Well is constructed with a deep surface seal and a screen depth that begins below the bottom of the entire alluvial aquifer system, whereas the Easement Well is constructed with a shallower surface seal and all of its screens below the shallow alluvial aquifer system. Between the bed of Dry Creek and the deeper aquifer materials accessible to these wells, multiple low permeability strata exist. These low permeability strata provide a natural separation, or impediment, between the creek and the aquifers accessed by the onsite wells; this results in a disconnection of these aquifers from the overlying shallow sediments upon which the creek flows. Pumping of the Project Well for the proposed project or pumping of the Easement Well for the uses of its water will thus not impact surface water flow in the proximal portions of Dry Creek, because surface water in Dry Creek is hydrogeologically disconnected from



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groundwater accessible to the Project Well and the Easement Well in the vicinity of the subject property.

- Pumping of the Project Well and the Easement Well will also not directly influence flows in the proximal portion of Dry Creek because:
 - 1) surface and subsurface data collected by others (LSCE, 2016 & 2022) demonstrate that groundwater in the deeper portion of the alluvial aquifer system and deeper formations is not directly connected to overlying surface water flows in Dry Creek;
 - 2) additional low-permeability strata exist above and below the lowest screened section of a nearby groundwater monitoring well, and above the screened sections of the Project Well and the Easement Well; and
 - 3) the Project Well and the Easement Well, as constructed, can only extract groundwater from earth materials beneath most, if not all, of those additional low-permeability strata.

According to the WAA Guidance document (Napa County, 2015), the Tier 3 analysis has been satisfied because a lack of hydraulic connection has been demonstrated between the Project & Easement Wells and the Significant Stream within 1,500 feet (ft) of these wells.

Introduction

This Memorandum presents the key findings and conclusions by Richard C. Slade & Associates LLC, Consulting Groundwater Geologists (RCS) regarding a Tier 3 Water Availability Analysis (WAA) for a proposed Winery Use Permit Modification at the A & B Vineyards Property, on the parcel identified by Napa County Assessor's Parcel Number (APN) 034-190-040 (referred to herein as the "subject parcel". The parcel boundaries presented herein were derived from publicly available parcel data (Napa County, 2024b). This Memorandum has been prepared to evaluate the effects, if any, that pumping the Project Well or the Easement Well might impart on surface water flows in the nearby Significant Stream.

Background

RCS prepared this document to provide conformance with Napa County Tier 3 WAA requirements (Napa County, 2015 & 2024a) following a 2022 Tier 1 WAA report prepared by the project engineer, Applied Civil Engineering Incorporated (ACE). ACE prepared that Tier 1 WAA to facilitate acquisition of a Winery Use Permit Modification for the permitted onsite winery, titled "Tier 1 Water Availability Analysis for the A & B Vineyards LLC Winery Use Permit Modification", dated January 6, 2022 (ACE, 2022). Although RCS relied on data contained within the Tier 1 WAA by ACE for the subject Tier 3 WAA Memorandum, RCS does not opine herein on that Tier 1 WAA work by ACE, and RCS does not augment or confirm that Tier 1 WAA work.

A Tier 3 WAA is required for the subject Use Permit Modification because the Project Well that will be used to supply groundwater to the subject winery lies within a County-defined Significant Stream 1,500-foot buffer area (PBES & LSCE, 2023b). Another active water well exists onsite, referred to herein as the Easement Well. RCS understands that groundwater extracted from the Easement Well is solely provided to an adjacent parcel. Groundwater pumped from the Easement Well is not currently used to meet any onsite demands, and it will not be used to meet any onsite



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demands in the future. However, Napa County personnel have requested that the Easement Well also be considered in the subject Tier 3 WAA.

Description of Subject Property

Figure 1, “Regional Map” shows the subject property on a small scale basemap of the area. Key features shown in the view of Figure 1 include the boundary of the subject parcel (Napa County, 2024b), the location of the Project Well, the location of the Easement Well, the State Department of Water Resources Bulletin 118 boundary of the local groundwater basin (DWR, 2021a), the locations of County-identified Significant Streams (PBES & LSCE, 2023a), and the 1,500-foot (ft) buffers around County-identified Significant Streams (PBES & LSCE, 2023b). The 1,500-ft Significant Stream buffer that encompasses the subject property was generated by the County around Dry Creek. Surface water in the portion of Dry Creek near the subject property flows, when present, along a northeasterly path towards the confluence with Hopper Creek. Near that junction, Dry Creek gradually curves southward until it ultimately discharges into the Napa River, more than two miles downstream from the Project & Easement Wells.

Figure 2, “Property Map”, and Figure 3, “Geologic Map”, show several of the same data depicted on Figure 1, with some additional features that include: the approximate locations of several known or possible nearby offsite wells owned by others with available driller’s logs; the location of a nested monitoring well associated with the Napa Valley Subbasin GSP (Groundwater Sustainability Plan) (LSCE, 2022); a nearby stream gaging station on Dry Creek for which data are available from Napa OneRain (Contrail, 2024); the alignment of a hydrogeologic cross section prepared by RCS for this Memorandum; and the alignments of two geologic cross sections prepared by others (LSCE & MBK, 2013; LSCE, 2022) that were used for reference, but not reproduced herein. The known and possible offsite wells with driller’s logs shown on these Figures were identified based on various sources, including a search of available records on the Napa County electronic document retrieval website (PBES, 2024). Among the documents used to help locate these known and possible offsite wells were State Well Completion Reports (WCRs, or “driller’s logs”), Napa County driller’s logs, and Napa County well permits.

Creek Flow Characteristics

RCS reviewed detailed data records found on the Napa OneRain website (Contrail, 2024) for flows in Dry Creek that occurred between April 2013 and May 2024. These flows were recorded by a stream gaging station known as “Dry Creek at Hwy 29” that is located about 2,100 ft northeast of the Project Well, where Dry Creek flows under State Highway 29. Twelve years¹ of flow data (May 2013 – April 2024) are summarized on Figure 4, below. The percentages shown atop each data column in Figure 4 represent the proportion of average annual flow that occurred during a given month, on average, during the period of record.

¹ Incomplete months at the beginning (April 2013) and end (May 2024) of the period of record are not included in the summarized data shown on Figure 4.



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Figure 4: Average Monthly Flow in Dry Creek at Highway 29 (May 2013 - April 2024)

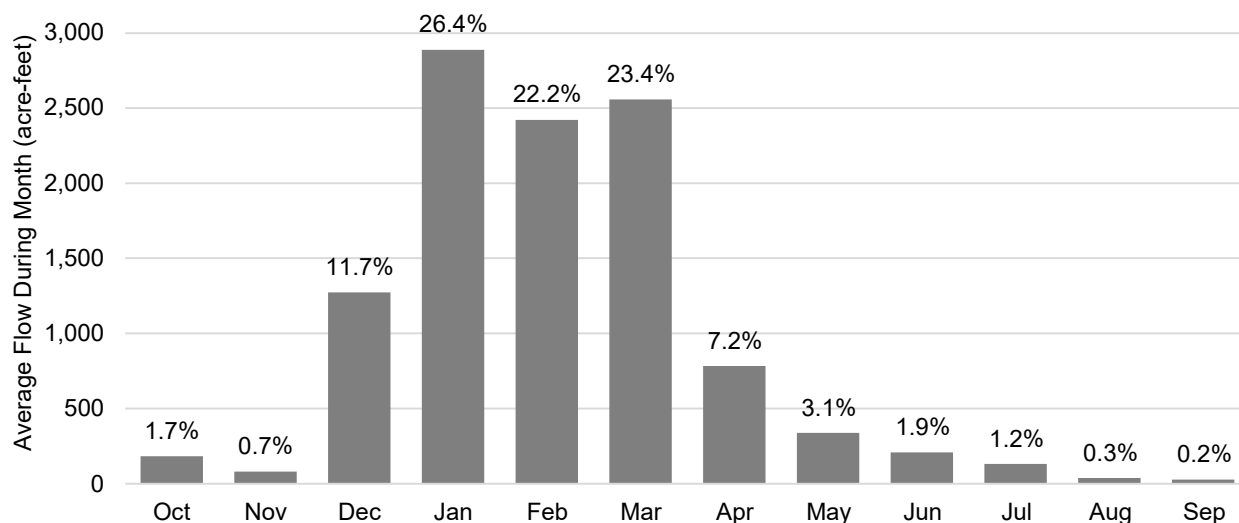


Figure 4 demonstrates that the vast majority of flow (nearly 84%) in Dry Creek near the subject property tends to occur between December and April, coinciding with the strong seasonality of regional precipitation. It is important to note that this section of the creek is shown as “intermittent” in the National Hydrographic Dataset (USGS, 2023). Therefore, while Figure 4 above shows that, on average, minor flows have occurred in Dry Creek in the summer and fall, the Creek is generally expected to be dry (not flowing) during the drier months of any given year. Significant flow was observed in the creek near the Project Well and the Easement Well by an RCS geologist during the March 19, 2024, visit to the subject property. However, only ponded water was reported in the creek near these wells by ACE personnel during their July 7, 2025, visit to the subject property.

Hydrogeology

Hydrogeologic Setting

Groundwater basin boundaries in California are defined and designated by the State Department of Water Resources (DWR) in data found in their Bulletin 118, “California’s Groundwater” (2021a). Those DWR groundwater basin boundaries are the same as those used to define groundwater basin boundaries for the purposes of Groundwater Sustainability Plan (GSP) preparation for basins throughout the State, including for the Napa Valley Subbasin (LSCE, 2022). The entire subject property, including the location of the Project & Easement Wells, is within the boundaries of the Napa-Sonoma Valley Subbasin, which is a subbasin of the Napa-Sonoma Valley Groundwater Basin (see Figure 1).

A regional geologic map by Wagner & Gutierrez (2017) is available from the California Geological Survey (CGS) and was adapted to create Figure 3. As shown on Figure 3, most of the ground surface of the subject property, including the locations of the Project Well and the Easement Well, was mapped by others as younger Alluvial Fan Deposits (Qhfy). The other geologic units at ground surface within the boundary of the subject property are Stream Channel Deposits (Qhc) and older Alluvial Fan Deposits (Qhf). Qhc deposits are often found along the beds of active alluvial stream channels, as they are within the subject property. Qhf are located to the northwest



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of the Qhc deposits at ground surface, horizontally separating the more westerly volcanics within the map area from the Qhc deposits.

Interpreted to underlie the alluvial deposits beneath the subject property, but not shown in the surficial mapping of Wagner & Gutierrez (2017), is a deposit of sands and clays likely derived from reworked volcanic ash (Tss/h) associated with the Sonoma Volcanics (LSCE, 2016). LSCE & MBK (2013) describe Tss/h as a “sedimentary rock” that is comprised of “Sand & Clay”; this unit is shown on Cross Section D-D’ of LSCE & MBK, and on Cross Section 2A-2A’ of LSCE (2022).

In the higher elevation western portion of the Figure 3 map area, various rocks of the Sonoma Volcanics have been mapped at ground surface separated from the subject property by several northerly trending geologic faults associated with the West Napa fault zone. These rocks are shown as Andesite Flow Breccia of Stags Leap (Psvbsl) in the highest-elevation, most western portion of the map area, and Rhyolite to Dacite Flows and Tuff (Tsvr) immediately east of the Psvbsl exposure. Tsvr is interpreted to directly underlie the Tss/h deposits proximal to and beneath the subject property. At great depth beneath Tsvr, geologically ancient basement rocks of Cretaceous to Jurassic age are known to exist. However, none of the boreholes of the wells shown on Figure 5 (discussed further below) are likely to have encountered those basement rocks, and those ancient rocks are not shown on Cross Section D-D’ of LSCE & MBK or on Cross Section 2A-2A’ of LSCE (2022). Therefore, those geologically ancient rocks do not play a direct role in groundwater availability to either the Project Well or the Easement Well, and they are thus not discussed further herein.

Hydrogeologic Cross Section and Well Construction

Figure 5, “Cross Section A-A’”, a scaled schematic illustration, was created to show the subsurface hydrogeologic conditions along the alignment of the section, as interpreted by RCS. The alignment of Cross Section A-A’ can be viewed on Figures 2 & 3; this alignment was configured such that it passes through the Project Well and the mapped location of Dry Creek (LSCE & PBES, 2023a) along the shortest straight-line distance between the two. It was extended beyond these features so that additional information could also be included on Figure 5.

Hydrogeologic interpretations shown on Figure 5 were made, primarily, based on: the geologic mapping by others described above; Cross Section D-D’ in LSCE & MBK (2013; orange line on Figure 3) and Cross Section 2A-2A’ in Section 5 of the local GSP (LSCE, 2022; pink line on Figure 3); and RCS interpretation of the driller’s descriptions of drill cuttings reported on driller’s logs for the wells shown on Figure 5. The driller’s logs for the onsite wells were provided by ACE, whereas the driller’s logs for the offsite wells were acquired from DWR (2021b) and Napa County PBES (2024).

Figure 5 shows the locations and key construction details of several wells along Cross Section A-A’ (referred to as A-A’ herein) for which driller’s logs were available, including the onsite Project Well, the onsite Easement Well, and several nearby offsite wells. The wells shown on Figure 5 that did not directly intersect with the alignment of A-A’ were projected onto A-A’ at their respective ground surface elevations²; the distance and direction of projection are shown for each of those wells, as applicable. Figure 5 is also notated with several surface

² The datum for all of the elevations reported in this document is the North American Vertical Datum of 1988 (NAVD88).



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features that intersect with A-A', including: the nearby Significant Stream location as derived from the Napa County data set (PBES & LSCE, 2023a), the topographic low³ in which Dry Creek actually flows, and the subject property boundaries. The data source for the ground surface elevations on Figure 5 was a high-resolution digital elevation model (DEM) with a one-meter horizontal resolution (USGS, 2020b). Also shown on A-A' are the available water level depth measurements for the wells shown on the section, as derived from measurements shown on the respective driller's logs, from pumping test data for the Project Well, from the March 19, 2024, RCS site visit, and from the July 7, 2025, ACE site visit.

Review of driller's logs for the wells shown on Figure 5 revealed the presence of abundant fine-grained, low-permeability clay-rich deposits between the bed of Dry Creek and the deeper portion of Sonoma Volcanics (Tsvr) along A-A'. Those driller's logs are included in the Appendix to this Memorandum, with the fine-grained material interpretations highlighted thereon. RCS interprets these clay-rich, fine-grained deposits to comprise a substantial portion of the Qhfy, Qhf, and Tss/h deposits beneath the subject property. However, based on review of the driller's logs alone, it is difficult to accurately determine the contact depth between Qhfy, Qhf, and Tss/h for any of the wells shown on Figure 5. The lithologies of these three units are somewhat similar, and driller's log descriptions tend not to provide the detail or consistent descriptions of drill cuttings of the earth materials that are encountered in boreholes that are necessary for accurate interpretation. Fortunately, two nearby geologic cross sections by LSCE & MBK (2013) and LSCE (2022) are available (alignments shown on Figure 3), upon which the subsurface interpretations and subsurface contact patterns on Figure 5 were augmented; these two sections were used to help estimate a contact depth between the finer grained, shallower deposits and the deeper Tsvr materials. Furthermore, a detailed geologic log (LSCE, 2016) for the nearby monitoring well borehole that contains the GSP nested monitoring well completions "216s-swgw2" and "217d-swgw2" also supports the presence of abundant clay-rich deposits between the bed of Dry Creek and the underlying Tsvr materials. For example, in the borehole of the 216s-swgw2 and 217d-swgw2 completions, between the depths of 51 ft and 73.5 ft bgs (below ground surface), the geologic log by others shows the earth materials to be clays that are composed of ">95% medium plastic fines". In that same borehole, clay with at least 80% medium plastic fines was reported over the depth intervals of 7-16 ft bgs, 47-49.5 ft bgs, 73.5-77 ft bgs, 79-79.5 ft bgs, and 81-100 ft bgs. RCS synthesized data presented on those cross sections by others with the driller's logs for the wells shown on Figure 5 and the above-mentioned GSP monitoring well borehole log into the interpretations of subsurface materials by RCS that are discussed herein and shown on Figure 5.

The topmost screened section of the Project Well reportedly begins at a depth of 95 ft bgs (elevation of 17.13 ft NAVD88). This depth is well within the RCS-interpreted depth range of the volcanic materials along Section A-A', and nearly entirely within the deeper portion of the Sonoma

³ The alignment of Dry Creek in the Significant Streams dataset is approximately 56 ft farther from the Project Well along A-A' than the DEM-derived topographic low in which Dry Creek actually flows. Review of aerial imagery generally agrees with the DEM-derived alignment of Dry Creek near the subject property better than it does with the County's Significant Streams alignment of Dry Creek. Furthermore, the ground surface elevation of the Significant Streams location of Dry Creek along A-A' is about 14-ft higher than the elevation of the topographic low along A-A'. If the elevation comparisons presented herein were based on the elevation where A-A' intersects the Significant Streams version of Dry Creek, larger differences would result for these comparisons. To present a more conservative analysis, all elevation comparisons to Dry Creek have been made with respect to the topographic low along A-A', rather than to the elevation of the Significant Streams alignment (PBES & LSCE, 2023a) of Dry Creek along A-A'.



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Volcanics (Tsvr). As noted above, abundant fine-grained materials have been reported in the nearby alluvium and in the shallower portions of the volcanic sedimentary materials (Tss/h). Based on that relatively deep screen top-depth in the Project Well, its 50-ft deep sanitary seal, and the presence of low permeability strata between the bed of Dry Creek and the top of Tsvr beneath the subject property, Dry Creek is geologically “separated” from groundwater accessible to the Project Well.

The topmost screened section of the Easement Well reportedly begins at a depth of 40 ft bgs (elevation of 71.92 ft NAVD88). This depth is immediately above the RCS-interpreted contact between Qhf and Tss/h, but still below significant fine-grained deposits described in the boreholes of both the Easement Well and the nearby GSP monitoring wells. Based on the presence of low permeability sediments that exist between the bed of Dry Creek and the top of the shallowest screened section of the Easement Well, Dry Creek is geologically “separated” from groundwater accessible to the Easement Well.

Abundant fine-grained, clay-rich deposits exist in the Qhfy, Qhf, and Tss/h deposits that provide a separation between the groundwater accessible by the Project & Easement Wells, and any surface water that may be present in Dry Creek near the subject property. Dry Creek is not connected to groundwater accessible to the Project & Easement Wells because these onsite wells are primarily screened against (derive groundwater from) the deeper rocks of the Sonoma Volcanics (Tsvr), far below the overlying, vertically isolated shallow alluvial deposits over which Dry Creek flows. Thus, pumping of the Project Well for the project, or pumping of the Easement Well for the offsite demands that it provides, will not impact surface water flow in the proximal portions of Dry Creek, because surface water in Dry Creek is hydrogeologically disconnected to groundwater accessible to the Project & Easement Wells in the vicinity of the subject property.

Groundwater Levels

Review of the water levels that have been measured in the Project & Easement Wells, and their relationship to the elevation of the nearby creek bed, demonstrates further evidence in support of a hydraulic disconnect between groundwater accessible to these wells and surface flows in Dry Creek (see Figure 5). The water level data shown on Figure 5 were derived from the driller’s logs for the depicted wells, from water levels measured in the onsite wells by an RCS groundwater geologist during the site visit on March 19, 2024, and from water level measurements in the onsite wells by ACE during their July 7, 2025, visit to the subject property.

The elevation of the water level measured in the Project Well in March 2024 was 87 ft below the bed of Dry Creek along A-A’ (the “topographic low”), whereas the water level elevation preceding the post-construction pumping test in the Project Well reported for November 2020 was 72 ft below the bed of Dry Creek along A-A’. These measurements were made at the end of the wet season (March) and at the end of the dry season (November), respectively. ACE attempted to measure an additional water level in the Project Well during their July 2025 site visit, near the middle of the dry season. However, ACE were unable to obtain a measurement because an obstruction was encountered in the well at a depth of approximately 181 ft bgs (168 ft below the elevation of the bed of Dry Creek along A-A’) that prevented their manual water level sounder from contacting the groundwater surface in the well. Therefore, the water level in the Project Well on July 7, 2025, must have been more than 168 ft lower in elevation than the bed of Dry Creek along A-A’. Despite the differing hydrologic conditions under which the three available water level



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depth measurements were obtained, the water surface in the Project Well has consistently been much lower in elevation than the bed of Dry Creek along A-A', by at least 72 ft. If Dry Creek was hydraulically connected to the groundwater accessible to the Project Well, the elevation of the water in the well would be expected to be at or near the elevation of the Creek when the Creek was observed to be flowing, but that is not the case. Dry Creek was indeed observed to be flowing near the Project Well at the time of the March 2024 water level measurement, but only ponded water (i.e., no-flow conditions) was reported in Dry Creek by ACE during their July 2025 site visit. Thus, comparison of available water level data for the Project Well to the bed elevation of Dry Creek where it is intersected by A-A' shows that surface water in this portion of Dry Creek, when present, is disconnected from the groundwater accessible to the Project Well.

The first known water level measured in the Easement Well was obtained shortly after the well was completed, in June 1990, per the corresponding WCR. The elevation of that water level was 7 ft below the bed elevation of Dry Creek where it is intersected by A-A'. Creek flow observations are not available for that time, so a comparison with creek flow conditions is not possible. However, it is the experience of RCS that initial the post-construction water level reported on a WCR can be shallower than the actual static water level in the well, which may only be revealed after initial pumping development operations remove remnant drilling fluids and allow the water column in the well to equilibrate with the screened aquifer system(s). It is also likely that the regional groundwater level was much shallower in 1990 than under present conditions because of the voluminous groundwater extractions that have occurred regionally over the years. In contrast, the water level measured by the RCS geologist in March 2024 in the Easement Well was 154 ft below the bed elevation of Dry Creek. Similarly, the July 2025 water level in the Easement Well by ACE was 150 ft below the bed elevation of Dry Creek.

The elevation of the water level measured by the RCS geologist in March 2024 in the Easement Well was considerably deeper than the water level measured in the Project Well that day, whereas the July 2025 measurements by ACE revealed the opposite relationship between the water level elevations in these onsite wells. The causes for these water level differences between the onsite wells are not immediately apparent, but it is important to note that all of the recent water level measurements in the onsite wells have been far lower in elevation than the nearby bed of Dry Creek. The Project Well is screened from 95-535 ft bgs, whereas the Easement Well is screened over two separate intervals: from 40-50 ft bgs and from 140-340 ft bgs (see Figure 5). One possibility is that the differences in water levels between the onsite wells in both pairs of measurements were caused by recent pumping activity in the wells. For the March 2024 measurements, the Easement Well may have been pumped not long before the measurement was taken, whereas the Project Well may have been pumped not long before the July 2025 measurement was taken. For the July 2025 measurements, it is also possible that both the Project & Easement Wells had been pumped shortly before the measurements were made, thereby lowering the water levels in both wells. However, it is additionally possible that a confined portion of the Tsvr aquifer that is accessible to the Project Well, but not the shallower Easement Well, could produce the observed difference in water levels in March 2024, and that the piezometric surface of the portion of the Tsvr aquifer is penetrated by only the Project Well had fallen by the time of the July 2025 measurements.

Despite the considerable variation between the June 1990 and more recent (i.e., March 2024 and July 2025) water levels in the Easement Well, the Easement Well is effectively hydraulically disconnected from flows in Dry Creek because, as described by the well driller on the Easement



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Well's WCR, the upper 15 ft of the borehole were "clay". Furthermore, the available water level measurements in the Easement Well have consistently been lower in elevation than the nearby bed of Dry Creek; particularly so for the recent March 2024 and July 2025 measurements. Thus, based on water level elevation differences and the presence of fine-grained materials, groundwater accessible to the Easement Well is disconnected from surface water flows in Dry Creek.

Napa Valley Subbasin Groundwater Sustainability Plan

Groundwater/Surface Water Interactions

The Napa Valley Subbasin Groundwater Sustainability Plan (GSP) presents data and analysis regarding interactions between groundwater and surface water, evaluated at various locations along watercourses within and tributary to the Napa Valley (LSCE, 2022). One of the stations used by the local Groundwater Sustainability Agency (GSA) to monitor those interactions is a dual-completion nested monitoring well, referred to therein as "Site 2 at Dry Creek". The location of that nested monitoring well is shown on Figures 2 & 3 of this Memorandum as "216s-swgw2" and "217d-swgw2" for the shallow and deep completions, respectively.

According to the 2022 Napa Valley Subbasin GSP: *"Data collected from Site 2 at Dry Creek show groundwater levels in both the shallow and deep casings are below the stream thalweg elevation during a majority of the monitoring period, indicating this location as a predominantly perennially losing stream (Figure 6-15). The USGS has mapped Dry Creek as an intermittent stream, therefore, recharge to the groundwater system is likely to occur at this location during the periods that water is flowing at this site."* (LSCE, 2022)

The section of Dry Creek proximal to the subject property is reported to be predominantly a losing stream relative to the alluvial aquifer system (LSCE, 2022), and a downward gradient from the shallow to deep completions was always present during the study period within the 80-ft portion of alluvium monitored by the wells at "Site 2 at Dry Creek".

Based on the detailed geologic logging of the borehole into which 216s-swgw2 and 217d-swgw2 were constructed, and on RCS's interpretation of several other driller's logs drilled proximal to the subject property (for wells shown on Figure 5) abundant fine-grained materials are present beneath the subject property. This is true in both the alluvial sediments (Qhfy and Qhf) and the underling Tss/h materials. These fine-grained materials likely act as aquitards, significantly reducing the potential for connectivity and vertical flow between surface water in Dry Creek and groundwater in the aquifer systems beneath the subject property. Monitoring data for the "Site 2 at Dry Creek" well completions in LSCE (2016 & 2022) demonstrates that Dry Creek is predominantly a losing stream, and those data demonstrate clear evidence of a disconnection between groundwater in the deeper alluvium accessed by "217d-swgw2" and groundwater in the shallower alluvium accessed by "216s-swgw2". In particular, temperature data on Figure 6-112 of the GSP show that the temperature of deeper alluvial groundwater does not apparently fluctuate, whereas the temperature of shallow alluvial groundwater appears to fluctuate slightly in response to the influence of surface water. Similarly, specific conductance data on Figure 4.6 of LSCE (2016) show likely influence of shallow alluvial groundwater by surface water, but little to no direct influence on deeper alluvial groundwater due to the effects of surface water.

Furthermore, according to the Napa County Groundwater Sustainability Annual Report – Water Year 2019: *"Given that most groundwater withdrawals in Napa Valley occur from depths greater*



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than 50 feet, the groundwater level data at Site 2 indicate how reductions in groundwater levels in deeper aquifer zones do not always result in equivalent water level reductions at the water table, where stream aquifer interactions can occur. Data collected at Site 2 show that this is true even at times of the year when the streambed is dry and groundwater recharge is not occurring along the stream.” LSCE (2020)

The bottom-depth of the screened section of the deeper nested well completion at “Site 2 at Dry Creek” only extends to a depth of 81 ft (elevation of 22.4 ft NAVD88), which is shallower than the top-elevation of the uppermost screen section of the Project Well (17.1 ft NAVD88), although it is deeper than the top-elevation of the uppermost screened section of the Easement Well (71.9 ft NAVD88). Furthermore, no portion of the screened section of the Project Well is set against alluvial materials (i.e., Qhc, Qhfy, Qhf), and very little, if any, of the screened section of the Easement Well is set against alluvial materials. In contrast, the entire screened section of “217d-swgw2” is reportedly within alluvial materials. Pumping of the Project & Easement Wells will therefore not directly influence flows in the proximal portion of Dry Creek because: 1) the data in LSCE (2016 & 2022) demonstrate that the deeper portion of the alluvial aquifer system is never directly connected to overlying surface water flows in Dry Creek; 2) additional low-permeability strata exist above and below the screened sections of “217d-swgw2”, and above the screened sections of the Project & Easement Wells; and 3) the Project & Easement Wells can only extract groundwater from earth materials beneath most, if not all, of those additional low-permeability strata.

In the Napa Valley GSP (LSCE, 2022), a discussion of the potential hydraulic connection between groundwater and creeks within and tributary to the Napa Valley is presented, as simulated by computer modeling. Figure 6-123b therein shows the “average annual hydraulic connection” of various watercourses in the region. On that Figure, the portion of Dry Creek near the subject property is shown to possibly undergo up to “> 13 weeks – 26 weeks” of average annual hydraulic connectivity, suggesting that surface water flows in this portion of Dry Creek may be connected to underlying shallow groundwater within the alluvial aquifer for up to 50% of the year. However, other evidence and discussion by LSCE in the GSP help to clarify that the connection is to shallower alluvial deposits only, and that a connection does not extend to deeper alluvial and Sonoma Volcanics deposits below the shallow alluvium. As discussed above, the screened sections of the Project & Easement Wells are disconnected from the shallow alluvium that LSCE (2016 & 2022) showed to be seasonally connected to the overlying surface water in Dry Creek. This is yet another piece of evidence that shows how the groundwater accessible to the Project & Easement Wells is disconnected from surface water flows in Dry Creek in the vicinity of the subject property.

As demonstrated above, both water level data and geologic data support the assertion that surface water flow in the portion of Dry Creek that is proximal to the subject property is hydraulically disconnected from the relatively deep groundwater accessible to the Project & Easement Wells. As shown on the Figure F-2 “Decision Tree” in the County’s WAA Guidance Document (Napa County, 2015), and as described in the Guidance Document text, the “Groundwater/Surface Water Evaluation is complete”, because the Project & Easement Wells are not hydraulically connected to surface water(s).



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Conclusion

Groundwater accessible to the Project & Easement Wells is not hydraulically connected to, and will not directly affect surface water flows in, the proximal portion of Dry Creek. This lack of connection is demonstrated by several factors, including:

- Available groundwater depth measurements in the Project Well have been at least 72 ft lower in elevation than the bed of Dry Creek, as measured along Cross Section A-A'. In March 2024, despite flow being present in the proximal portion of Dry Creek, the water level in the Project Well was 89 ft below the bed of the creek. In July 2025, the water level in the Project Well was more than 168 ft lower in elevation than the bed of Dry Creek, and ponded water was present in the nearby portion of the creek.
- Available groundwater depth measurements in the Easement Well have been at least 7 ft lower in elevation than the bed of Dry Creek, as measured along Cross Section A-A', and more recent water levels have been much deeper. In March 2024, despite flows being present in the proximal portion of Dry Creek, the water level in the Easement Well was 153 ft below the bed of the creek. In July 2025, the water level in the Easement Well was 150 ft below the bed of Dry Creek, and ponded water was present in the nearby portion of the creek.
- The Project Well is constructed with a 50-foot-deep surface seal and a screen depth that begins below the bottom of the alluvial aquifer system. Between the bed of Dry Creek and the deeper aquifer materials accessible to the Project & Easement Wells (primarily Tsvr), low permeability strata have been documented in, and inferred from, various data sources. Therefore, Dry Creek is not connected to groundwater accessible to the Project & Easement Wells. Pumping of the Project Well for the proposed project will not impact surface water flow in the proximal portions of Dry Creek because surface water in the creek is hydrogeologically disconnected from groundwater accessible to the Project Well in the vicinity of the subject property. Similarly, pumping of the Easement Well to meet its existing demands will not impact surface water flow in the proximal portions of Dry Creek because surface water in the creek is hydrogeologically disconnected from groundwater accessible to the Easement Well in the vicinity of the subject property.
- Pumping of the Project & Easement Wells will not directly influence flows in the proximal portion of Dry Creek because: 1) surface and subsurface data collected by others (LSCE, 2016 & 2022) demonstrate that groundwater in the deeper portion of the alluvial aquifer system (and therefore also the underlying earth materials) is not directly connected to overlying surface water flows in Dry Creek; 2) additional low-permeability strata exist above and below the screened sections of "217d-swgw2", and above the screened sections of the Project & Easement Wells; and 3) the Project & Easement Wells, as constructed, can only extract groundwater from earth materials beneath most, if not all, of those additional low-permeability strata.

According to the WAA Guidance document (Napa County, 2015), the Tier 3 analysis has been satisfied because a lack of hydraulic connection between the Project & Easement Wells and the Significant Stream within 1,500 feet of these wells has been demonstrated.



REVISED MEMORANDUM

Closure/Disclaimer

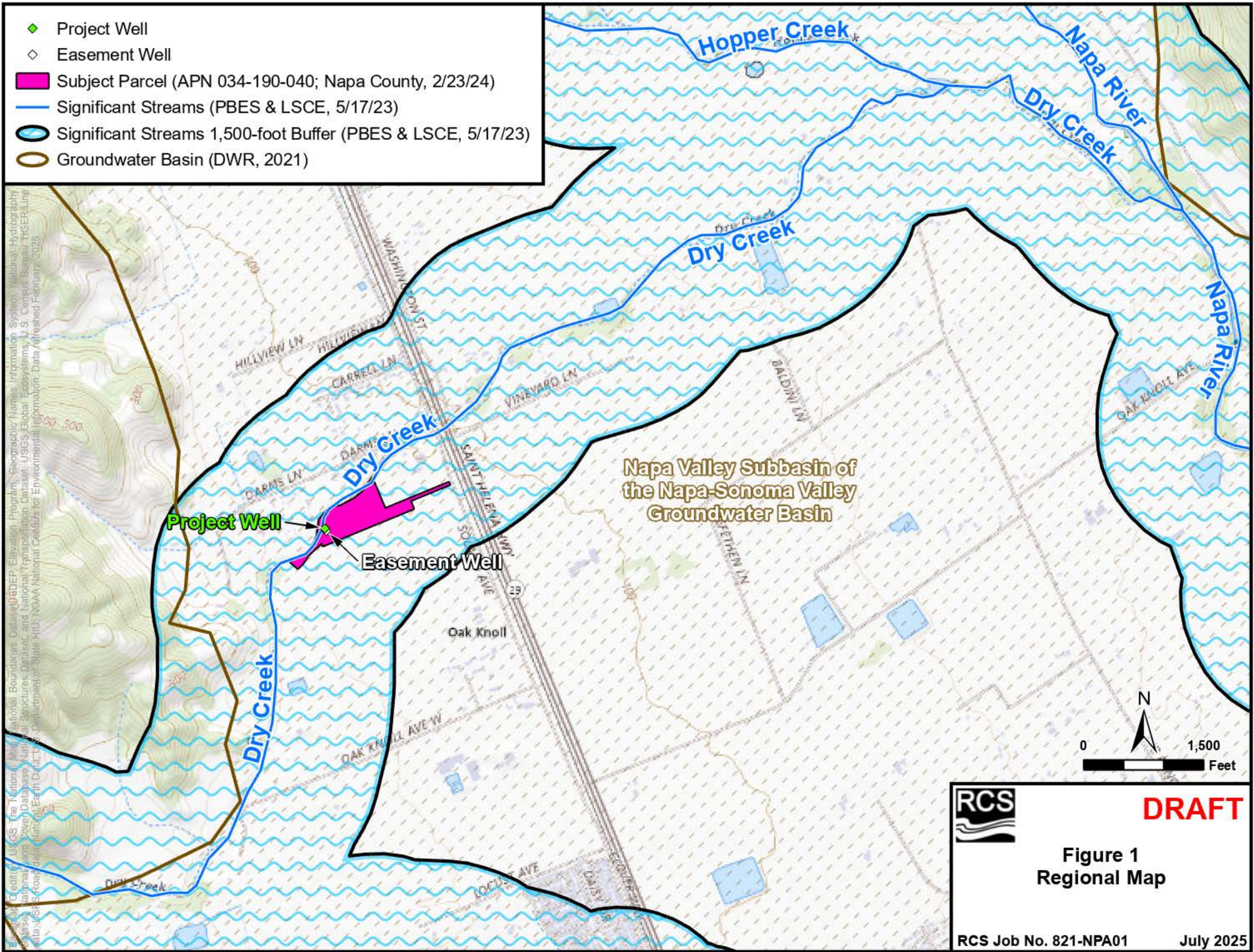
This Memorandum regarding a Tier 3 WAA for a Winery Use Permit Modification at the A & B Vineyards property located at 5125 Solano Avenue, in Napa County, CA (APN 034-190-040) has been prepared for A & B Vineyards and applies only to the evaluation of the subject property for the requirements discussed herein. This Memorandum has been prepared in accordance with the care and skill generally exercised by reputable professionals, under similar circumstances, and in this or similar localities. No other warranty, either express or implied, is made to the calculations, conclusions, or professional advice presented herein.



REVISED MEMORANDUM

References:

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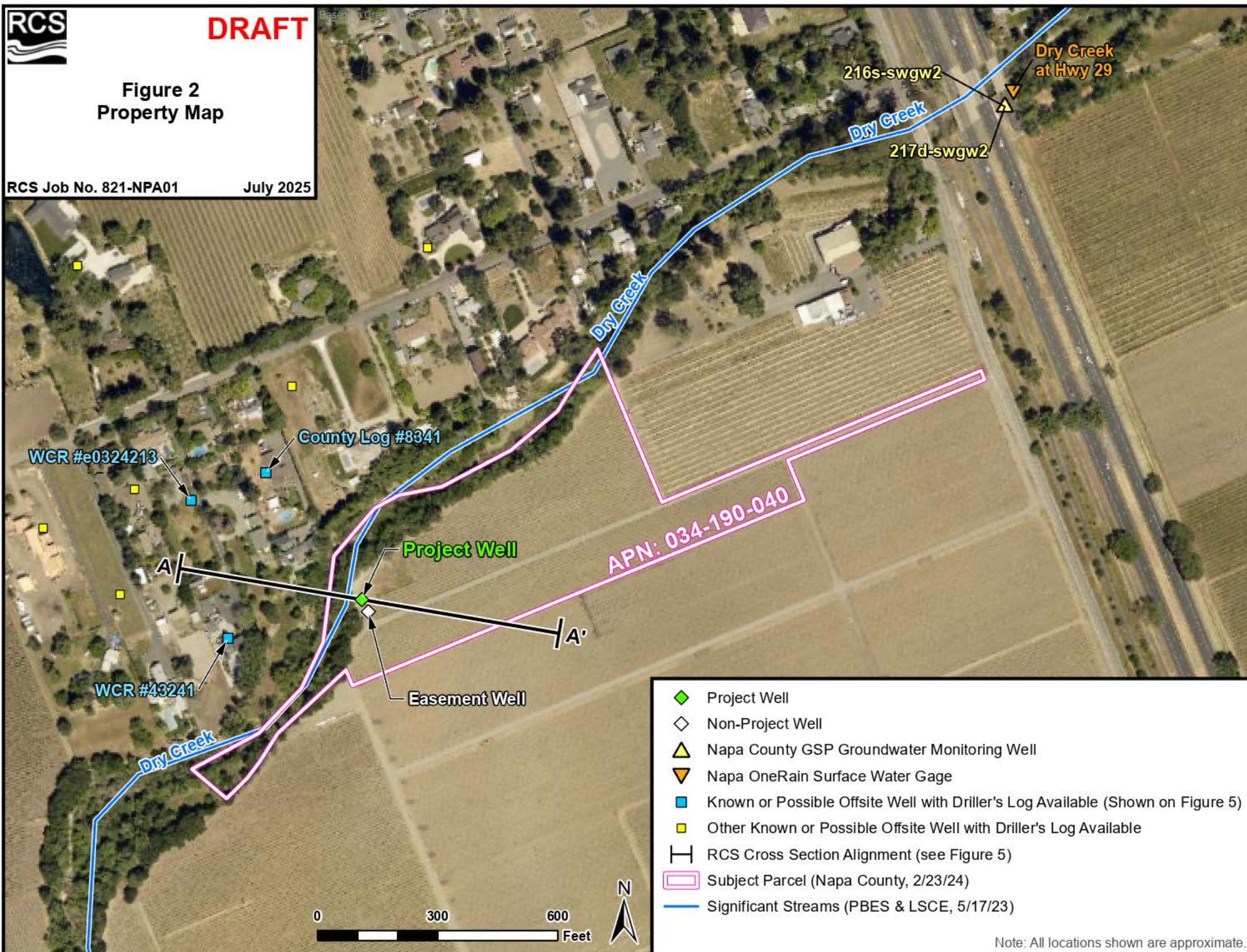


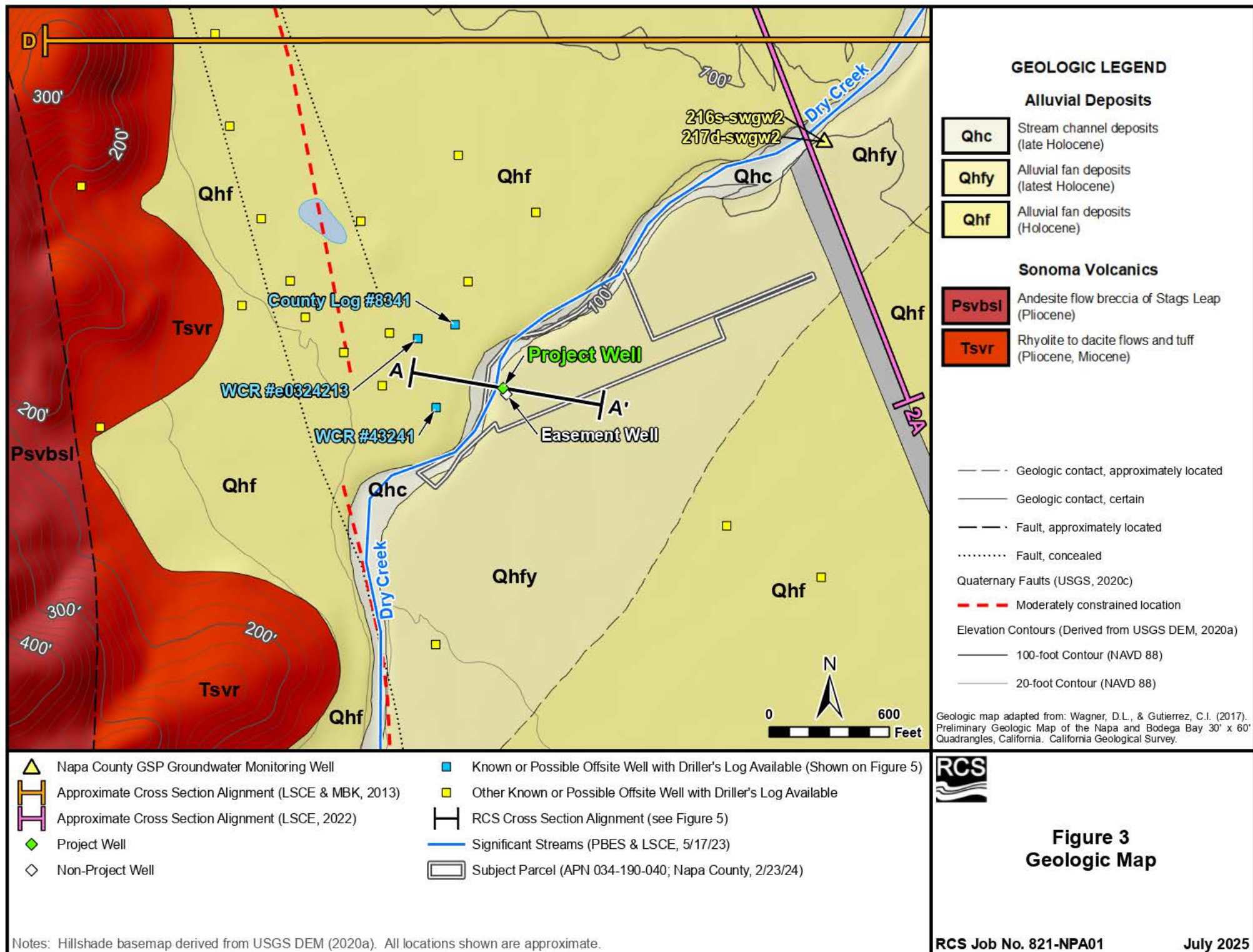
DRAFT

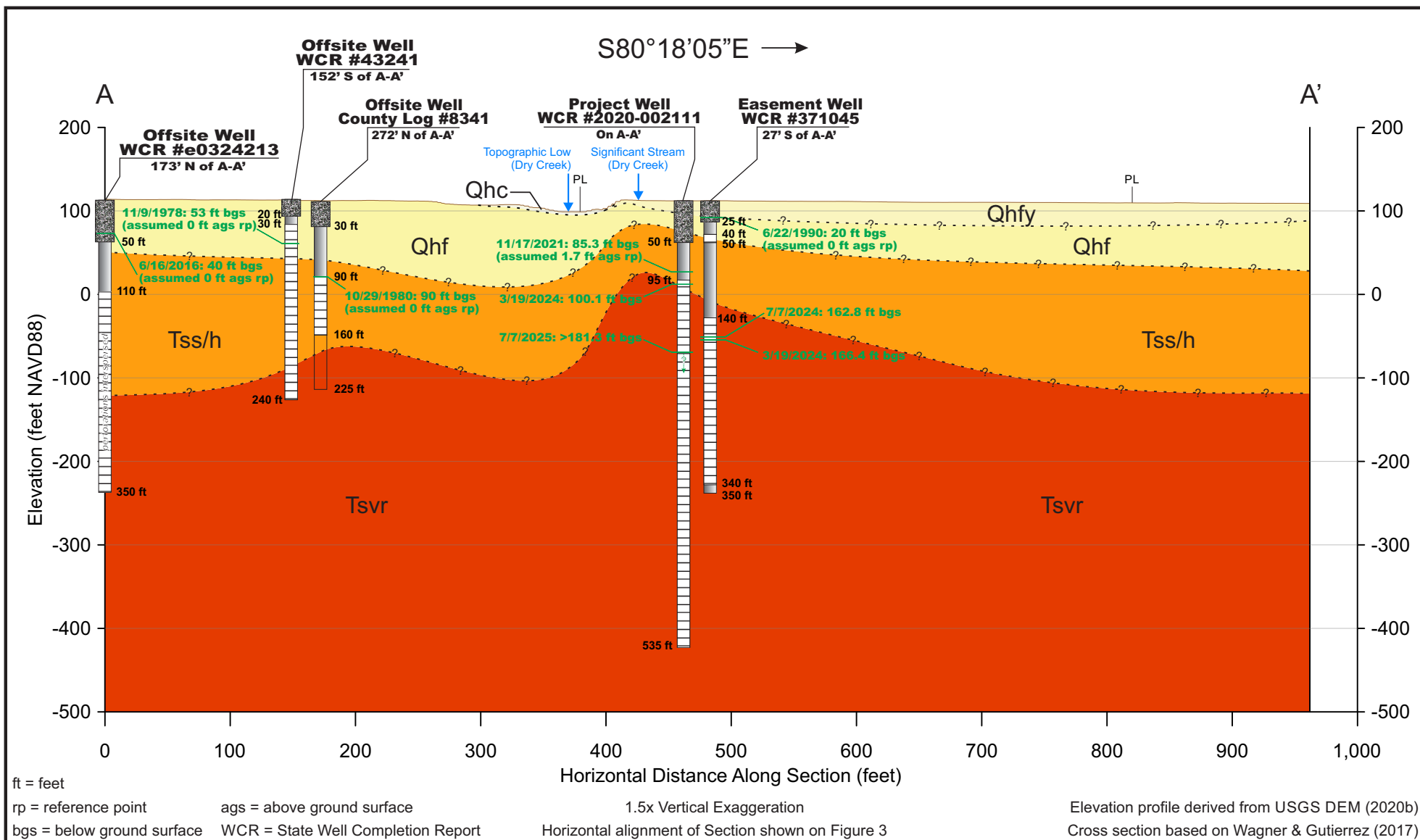
**Figure 2
Property Map**

RCS Job No. 821-NPA01

July 2025







ft = Well Construction Depth Below Ground Surface in Feet
(as Reported on Driller's Logs for Completed Wells)

ft bgs = Depth to Static Water Level Measurement
(feet below ground surface)

■ = Sanitary Seal
□ = Perforated Casing
□ = Blank Casing
□ = Open Borehole

- - - - Geologic Contact, Inferred

- - ? - - Geologic Contact, Queried

Qhc	Stream channel deposits (late Holocene)
Qhfy	Alluvial fan deposits (latest Holocene)
Qhf	Alluvial fan deposits (Holocene)
Tss/h	Sands and Clays (Tertiary) of LSCE & MBK (2013)
Tsvr	Rhyolite to dacite flows and tuff (Pliocene, Miocene)



DRAFT

Figure 5
Cross Section A-A'

Job No. 821-NPA01

July 2025



REVISED MEMORANDUM

APPENDIX

**Driller's Logs for
Wells on
RCS Cross Section A-A'
(Figure 5)**

State of California
Well Completion Report
 Form DWR 188 Submitted 2/13/2020
 WCR2020-002111

Owner's Well Number 2020-1 Date Work Began 12/19/2019 Date Work Ended 02/04/2020
 Local Permit Agency Napa County Planning Building and Environmental Services
 Secondary Permit Agency _____ Permit Number E19-00681 Permit Date 12/16/2019

Well Owner (must remain confidential pursuant to Water Code 13752)	Planned Use and Activity
Name <u>IDEOLOGY CELLARS,</u>	Activity <u>New Well</u>
Mailing Address <u>5225 Solano Ave</u>	Planned Use <u>Water Supply Irrigation -</u>
City <u>Napa</u> State <u>CA</u> Zip <u>94558</u>	<u>Landscape</u>

Well Location	
Address <u>5151 Solano AVE</u>	APN <u>034-190-040</u>
City <u>Napa</u> Zip <u>94559</u> County <u>Napa</u>	Township <u>06 N</u>
Latitude <u>38</u> <u>21</u> <u>41.7974</u> <u>N</u> Longitude <u>-122</u> <u>20</u> <u>11.8352</u> <u>W</u>	Range <u>04 W</u>
Deg. Min. Sec. Deg. Min. Sec.	Section <u>18</u>
Dec. Lat. <u>38.3616104</u> Dec. Long. <u>-122.3366209</u>	Baseline Meridian <u>Mount Diablo</u>
Vertical Datum _____ Horizontal Datum <u>WGS84</u>	Ground Surface Elevation _____
Location Accuracy _____ Location Determination Method _____	Elevation Accuracy _____
	Elevation Determination Method _____

Borehole Information	Water Level and Yield of Completed Well
Orientation <u>Vertical</u> Specify _____	Depth to first water _____ (Feet below surface)
Drilling Method <u>Direct Rotary</u> Drilling Fluid <u>Other - Mud</u>	Depth to Static _____
Total Depth of Boring <u>545</u> Feet	Water Level _____ (Feet) Date Measured <u>02/04/2020</u>
Total Depth of Completed Well <u>535</u> Feet	Estimated Yield* <u>150</u> (GPM) Test Type <u>Air Lift</u>
	Test Length <u>4</u> (Hours) Total Drawdown <u>525</u> (feet)
	*May not be representative of a well's long term yield.

Geologic Log - Free Form		
Depth from Surface	Feet to Feet	Description
0	4	Top soil rocky
4	10	Gravel
10	23	Clay tan Fine-grained materials
23	25	River rock
25	30	Clay
30	35	Gray clay and sandstone Fine-grained materials
35	50	Clay
50	60	Rock and fractured
60	65	Green clay and gravel mix
65	80	Tan clay Fine-grained materials
80	90	Blue clay and gravel mix
90	105	Cemented gravel
105	130	Rock and clay green
130	135	Rock and clay layers
135	143	Clay and rock layers

143	150	Fractured rock
150	153	Clay
153	170	Clay and rock
170	205	Sandstone layers and clay
205	230	Sandstone and black rock layers
230	290	Sandstone and clay layers
290	300	Clay
300	320	Rock and clay layers
320	325	Clay and rock layers
325	340	Fractured greenstone
340	347	Greenstone and clay
347	360	Fractured greenstone
360	363	Clay and rock
363	370	Fractured rock black
370	400	Fractured rock and clay layers
400	410	Black rock and clay layers
410	430	Clay and rock layers
430	450	Fractured sandstone with clay layers
450	470	Multi color volcanic rock fractured up
470	490	Black rock and red clay layers
490	507	Rock and clay layers
507	515	Fractured black rock
515	530	Clay and rock layers
530	545	Rock and clay layers

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	95	Blank	PVC	OD: 8.625 in. SDR: 17 Thickness: 0.508 in.	0.508	8.625			
1	95	535	Screen	PVC	OD: 8.625 in. SDR: 17 Thickness: 0.508 in.	0.508	8.625	Milled Slots	0.032	

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	3	Cement	Other Cement		
3	50	Bentonite	Other Bentonite		
50	545	Filter Pack	8 x 16		

Other Observations:

parcel # 34-212-30

ORIGINAL
File with DWR

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

Do not fill in

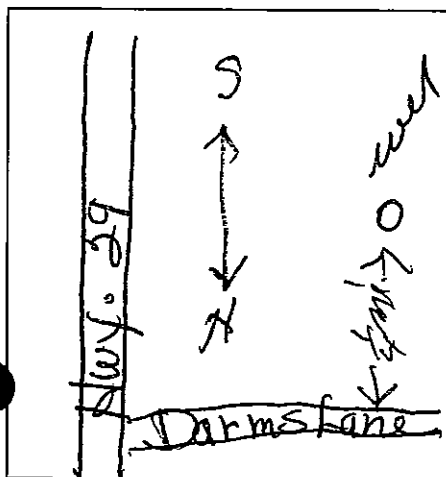
No. 371045

Notice of Intent No. _____
Local Permit No. or Date 26445

State Well No. _____
Other Well No. 06NOADW18

(2) LOCATION OF WELL (See instructions):

County 28 Owner's Well Number _____
Well address if different from above Same
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. 14 mi. So. of Farms Lane on Hwy. 29



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 ☐
Municipal ☐
Other ☐ (Describe)

(12) WELL LOG: Total depth 410 ft. Completed depth 350 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

0 - 15' clay Fine-grained materials

15 - 19' sandy clay, boulders
and gravel

19 - 40' clay Fine-grained materials

40 - 50' sandy clay, boulders
and gravel

50 - 75' clay Fine-grained materials

75 - 120' hard clay & rock

120 - 340' hard volcanic
ash & rock

340 - 410' hard volcanic

(5) EQUIPMENT:

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

(6) GRAVEL PACK:

Yes ☒ No ☐ Size 20-40
Diameter of bore 10 1/2
Packed from 25 to 350 ft.

(7) CASING INSTALLED:

Steel ☐ Plastic ☒ Concrete ☐

(8) PERFORATIONS:

Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	350	6	160	40	140	5/8"
				140	350	SCREEN

(9) WELL SEAL:

Was surface sanitary seal provided? Yes ☒ No ☐ If yes, to depth 25 ft.
Were strata sealed against pollution? Yes ☒ No ☐ Interval 15-19 ft.
Method of sealing Cement

(10) WATER LEVELS:

Depth of first water, if known 15 ft.
Standing level after well completion 20 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 30 ft. At end of test 200 ft.
Discharge 120 gal/min after 5 hours Water temperature _____
Chemical analysis made? Yes ☐ No ☒ If yes, by whom? _____
Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

Work started 5-25-90 Completed 6-22-90

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 B.W. Pulliam (Well Driller)
NAME Pulliam Well Drilling
Address 2877 Piedmont Ave
City Rocky Hill ZIP 94558
License No. 548677 Date of this report 7-3-90

Environmental

Cover Sheet

APN	034 - 212 - 006 - 000
Permit #	
Program	Well
DocType	WL
Street #	1123
Street Name	Darms Ln
Year	



TRIPPLICATE
Owner's Copy

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

TRS 6-4-18
8-35-240 Do not fill in
No. 43241

Notice of Intent No. _____
Local Permit No. or Date _____

State Well No. _____
Other Well No. _____

(1) OWNER: Name _____
Address _____
City _____

(12) WELL LOG: Total depth 240 ft. Depth of completed well 240 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

(2) LOCATION OF WELL (See instructions)
County Napa Owner's Well Number _____
Well address if different from above _____
Township _____ Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____

0 - 100 Original well
100 - 140 Blue clay
140 - 170 Blue clay w/cemented gravel
170 - 200 Blue clay
200 - 240 Hard volcanic rock

A.P. # 34-212-06

(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 ☐

WELL LOCATION SKETCH

(5) EQUIPMENT:

Rotary ☒ Reverse ☐ Yes ☒ No ☐ Size Birds Eye
Cable ☐ Air ☐ Diameter of bore 6"
Other ☐ Bucket ☐ Packed from 20 to 240 ft.

(6) GRAVEL PACK:

(7) CASING INSTALLED:

Steel ☐ Plastic ☐ Concrete ☐
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	240	4"	12 ga.	30	240	1/8 x 3

(8) PERFORATIONS:

(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 neat cement

(10) WATER LEVELS:

Depth of first water, if known _____ ft.
Standing level after well completion 53 ft.

(11) WELL TESTS:

Was well test made? Yes ☒ No ☐ If yes, by whom? driller
Type of test Pump ☐ Bailor ☐ Air lift ☐
Depth to water at start of test _____ ft. At end of test _____ ft.
Discharge 35 gal/min after 4 hours Water temperature _____
Chemical analysis made? Yes ☐ No ☐ If yes, by whom? _____
Was electric log made? Yes ☐ No ☒ If yes, attach copy to this report

Work started 11-6 19 78 Completed 11-9 19 78

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 Erwin C. Brown (Well Driller)

NAME American Well & Pump Service

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

Address 23002 Arnold Dr.

City Sonoma

Zip 95476

License No. 246342

Date of this report 11-20-78

HEALTH DEPT. USE ONLY

FEE _____

DATE _____

RECEIPT NO. _____

BY _____

NAPA COUNTY HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTHRECEIVED
DEC 15 1978APPLICATION & PERMIT TO CONSTRUCT
A WATER WELLDIVISION OF
ENVIRONMENTAL HEALTHNAME _____ ADDRESS _____ DATE _____
(OWNER) (JOB LOCATION)NAME _____ ADDRESS _____
(WELL DRILLER)TYPE OF WORK NEW WELL _____ RECONDITIONING _____ DEEPENING _____
TEST HOLES _____ DESTROYING _____ OTHER _____
TYPE I PERMIT _____ TYPE II PERMIT _____ FEE _____PROPOSED USE DOMESTIC _____ IRRIGATION _____ INDUSTRIAL _____ MUNICIPAL _____
TEST WELL _____ OTHER _____Sewage disposal on site (existing or proposed) Public _____ Individual _____ Private _____
Distance from well to any part of nearest sewage disposal system _____ feet
(Sketch of site to accompany application.)TYPE OF EQUIPMENT TO BE USED Rotary ☒ Cable _____ Hand Dug _____ Other _____CONSTRUCTION PROPOSED Diameter of casing 4" Material steel Annular Space: Size 2"
Sealed with: Concrete _____ Grout _____ Neat Cement ☒ Puddled Clay _____ Other _____
Conductor Casing: Yes _____ No ☒ Material _____
Chlorination by: Owner _____ Pump Co. _____ Driller _____
Gravel Pack: Yes _____ No _____
(SIGNATURE OF APPLICANT) _____ (DATE) _____

CASING

CONSTRUCTION:

Total Depth 240 Ft.Surface Seal to 20 Ft.Any stratas sealed: Yes _____ No ☒

If yes, depth of stratas:

From _____ Ft. to _____ Feet

From _____ Ft. to _____ Feet

Perforations:

From 30 Ft. to 240 Feet

From _____ Ft. to _____ Feet

From _____ Ft. to _____ Feet

WATER LEVELS

First water at ? FeetStatic level at 53 Feet

WELL TESTS

How performed Air LiftYield 35 GPM with _____ FeetDrawdown _____ Ft. after 4 Hrs.

WELL LOG

(Formation; describe by color, size of material, structure)

Ft. to Ft.

Existing seal Repair job - had existing seal
Annular Space Depth [20'] thickness [2"]
Own seal to 20' (neat cement)

0-100' Original Well
100-140' Blue Clay
140-170' Blue clay w/cemented gravel
170-200' Blue clay
200-240' Hard volcanic rock

Signed

Erwin C. Gross Jr.

License No.

246342

I, Erwin C. Gross

, as a contractor for the above work,

hereby certify that the above was installed according to all applicable rules and regulations covered by this permit, and that the information is true and correct to the best of my knowledge.

Erwin C. Gross / c.g.

Contractor's Signature

Environmental

Cover Sheet

APN	034 - 212 - 009 - 000
Permit #	
Program	Well
DocType	WL
Street #	1107
Street Name	Darms Ln
Year	1980



FEE 140 DATE 11-30-80
RECEIPT NO. 1341 BY W

TRS 6-4-18
B-20-225

AP. NO. 34-212-09

NAPA COUNTY HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTH

APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME [REDACTED] ADDRESS [REDACTED]
NAME Bill Pulliam (Owner) ADDRESS 3877 Piedmont Ave (Job Location) DATE 10-29-80
(Well Driller)

TYPE OF WORK NEW WELL X RECONDITIONING _____ DEEPENING _____
TYPE I PERMIT X DESTROY _____ OTHER _____
TYPE II PERMIT _____

PROPOSED USE DOMESTIC X IRRIGATION _____ INDUSTRIAL _____ MUNICIPAL _____
TEST WELL _____ OTHER _____

Sewage Disposal on site (existing or proposed) Public _____ Individual _____ Private X
Distance from well to any part of nearest sewage disposal system 100' feet.
(Sketch of site to accompany application) County road setback 50 feet from centerline.

TYPE OF EQUIPMENT TO BE USED: Rotary X Cable _____ Hand Dug _____ Other _____

WORKER'S COMPENSATION COVERAGE: (Check one of the following)

- ☐ A certificate of current Worker's Compensation Insurance coverage is presently on file with this office.
☐ A certificate of current Worker's Compensation Insurance is being filed with this application.
☒ I certify that in the performance of the work for which this permit is issued I shall not employ any person in any manner so as to become subject to the Worker's Compensation laws in California.

Bill Pulliam
Signature of Applicant

10-29-80
Date

CASING

CONSTRUCTION:

Total Depth 225 Ft. Depth of Casing 160
Surface Seal to 30
Any Stratas Sealed: Yes _____ No X
If yes, depth of stratas: _____
From _____ Ft. to _____ Ft. / From 160 Ft. to 160 Ft.
Perforations:
From 90 Ft. to 160 Ft. / From _____ Ft. to _____ Ft.
From _____ Ft. to _____ Ft.

WATER LEVELS

First Water at _____ Ft. Static level at 90 Ft.

WELL TESTS

How performed Bail
Yield 30 GPM with 90 Ft. Drawdown after 1 1/2
Hrs. Annular space depth 27 Ft. / Thickness 3
_____ in. Diameter of casing 6 Material PLASTIC
Gravel Pack: Yes X No _____ Conductor Casing:
Yes _____ No X Sealed with: Concrete X
Grout _____ Neat Cement _____ Pudd. Clay _____
Other _____ Chlorination by: Owner X
Pump Co. _____ Driller _____

WELL LOG

(Formation; described by color, size of material, structure)

Ft.	to	Ft.
0-35	clay	
35-38	clay, gravel	
38-53	clay	
53-56	clay, gravel	
56-70	clay	
70-180	green ash, black rock	
180-225	black rock	

Fine-grained materials

CONTRACTOR'S STATEMENT: I, Bill Pulliam, contractor for the above work, hereby certify that the above was installed according to all applicable rules and regulations covered by this permit, and that the information is true and correct to the best of my knowledge.

Bill Pulliam
Contractor's Signature

E-69

034-212-008

Well Completion Report

Page 1 of 3

Owner's Well Number #2

No. e0324213

Date Work Began 06/09/2016

Date Work Ended 6/16/2016

Local Permit Agency Napa County Environmental Health

Permit Number E15-00963

Permit Date 12/15/15

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 Rotary

Drilling Fluid Fresh Water

Depth from Surface

Description

Feet to Feet

Describe material, grain size, color, etc.

0	7	Clay and gravel
7	32	Big gravel
32	54	Brown clay and gravel
54	62	Gravel, some clay
62	120	Green volcanics with streaks of ash and clay
120	150	Harder volcanics green
150	186	Clayey volcanics and ash
186	201	Green clay embedded volcanics
201	234	Ashy volcanics, some clay
234	243	Volcanics
243	257	White clay and volcanics
257	270	Harder volcanics
270	336	Clay and volcanic rock ashy
336	346	Fractured volcanics
346	350	Clayey volcanics

Fine-grained materials

RECEIVED
JUN 16 2016
Napa County
& Environmental Health

Total Depth of Boring 350 Feet

Total Depth of Completed Well 350 Feet

Well Owner

Name Gail Conrads

Mailing Address 1125 Darms Lane

City Napa State Ca Zip 94558

Well Location

Address 1125 Darms Lane

City Napa

County Napa

Latitude 38 21 45 N Longitude 122 20 41 W

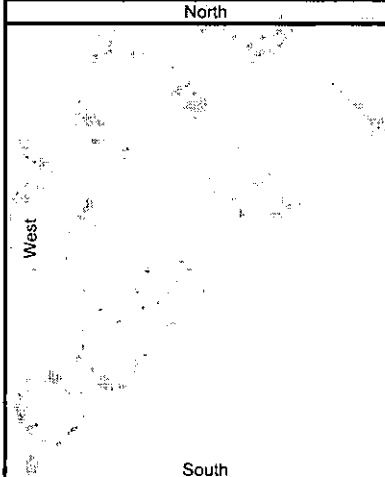
Datum _____ Decimal Lat. _____ Decimal Long. _____

APN Book 034 Page 212 Parcel 005

Township 6N Range 4W Section 18

Location Sketch

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



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 40 (Feet) Date Measured 06/16/2016

Estimated Yield * 150 (GPM) Test Type Air Lift

Test Length 1.0 (Hours) Total Drawdown 260 (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	50	11					
50	120	9 7/8					
120	350	8					
0	110	Blank	PVC Sch. 40	SDR21	5		
110	130	Screen	PVC Sch. 40	SDR21	5	Milled Slots	0.032
130	150	Blank	PVC Sch. 40	SDR21	5		

Annular Material

Depth from Surface Feet to Feet	Fill	Description
0	50	Cement
50	350	Filter Pack #6 Sand

Attachments

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

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

Sebastopol

CA 95473

Signed

Address

City

State

Zip

C-57 Licensed Water Well Contractor

Date Signed 9/26/16

177681

C-57 License Number

Attach additional information, if it exists.

DWR Use Only – Do Not Fill In												
State Well Number/Site Number												
Latitude						N	Longitude					W
APN/TRS/Other												

[illegible]

Well Owner
Name Gail Conrads
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City Napa State Ca Zip 94558

Well Location

Address 1125 Darms Lane

City Napa County Napa

Latitude 38 21 45 N. Longitude 122 20 41 W
Dec. Min. Sec. Dec. Min. Sec.

Datum _____ Decimal Lat. _____ Decimal Long. _____

APN Book 034 Page 212 Parcel 005

Township 6N Range 4W Section 18

Location Sketch (Sketch must be drawn by hand after form is printed.)		Activity
North West East South	☒ 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 _____	
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.		

Water Level and Yield of Completed Well			
Depth to first water	(Feet below surface)		
Depth to Static			
Water Level	40	(Feet)	Date Measured 06/16/2016
Estimated Yield *	150	(GPM)	Test Type Air Lift
Test Length	1.0	(Hours)	Total Drawdown 260 (Feet)
*May not be representative of a well's long term yield.			

Casings								Annular Material				
Depth from Surface Feet to Feet		Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)	Depth from Surface Feet to Feet		Fill	Description
150	170		Screen	PVC Sch. 40	SDR21	5	Milled Slots	0.032	0	50	Cement	
170	190		Blank	PVC Sch. 40	SDR21	5			50	350	Filter Pack	#6 Sand
190	210		Screen	PVC Sch. 40	SDR21	5	Milled Slots	0.032				
210	230		Blank	PVC Sch. 40	SDR21	5						
230	250		Screen	PVC Sch. 40	SDR21	5	Milled Slots	0.032				
250	270		Blank	PVC Sch. 40	SDR21	5						

Attachments ☐ Geologic Log ☐ Well Construction Diagram ☐ Geophysical Log(s) ☐ Soil/Water Chemical Analyses ☒ Other <u>Site Map</u> 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 <u>Weeks Drilling & Pump Company</u> Person, Firm or Corporation <u>P.O. Box 176</u> <u>Sebastopol</u> <u>CA</u> <u>95473</u> Address City State Zip Signed <u>[Signature]</u> <u>9/26/16</u> <u>177681</u> C-57 Licensed Water Well Contractor Date Signed C-57 License Number	
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State of California
Well Completion ReportPage 3 of 3Owner's Well Number #2No. e0324213Date Work Began 06/09/2016Date Work Ended 6/16/2016Local Permit Agency Napa County Environmental HealthPermit Number E15-00963Permit Date 12/15/15

DWR Use Only - Do Not Fill In

State Well Number/Site Number

N

Latitude

W

Longitude

APN/TRS/Other

Geologic LogOrientation ☒ Vertical ☐ Horizontal ☐ Angle Specify _____Drilling Method Direct Rotary Drilling Fluid Fresh WaterDepth from Surface _____ Description _____
Feet to Feet Describe material, grain size, color, etc

0	7	Clay and gravel
7	32	Big gravel
32	54	Brown clay and gravel
54	62	Gravel, some clay
62	120	Green volcanics with streaks of ash and clay
120	150	Harder volcanics green
150	186	Clayey volcanics and ash
186	201	Green clay embedded volcanics
201	234	Ashy volcanics, some clay
234	243	Volcanics
243	257	White clay and volcanics
257	270	Harder volcanics
270	336	Clay and volcanic rock ashy
336	346	Fractured volcanics
346	350	Clayey volcanics

Total Depth of Boring 350 FeetTotal Depth of Completed Well 350 Feet**Well Owner**Name Gail ConradsMailing Address 1125 Darms LaneCity Napa State Ca Zip 94558**Well Location**Address 1125 Darms LaneCity Napa County NapaLatitude 38 21 45 N Longitude 122 20 41 W
Deg. Min. Sec. Deg. Min. Sec.

Datum _____ Decimal Lat. _____ Decimal Long. _____

APN Book 034 Page 212 Parcel 005Township 6N Range 4W Section 18**Location Sketch**

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**Activity**

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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)
270	290	Screen	PVC Sch. 40	SDR21	5	Milled Slots	0.032
290	310	Blank	PVC Sch. 40	SDR21	5		
310	350	Screen	PVC Sch. 40	SDR21	5	Milled Slots	0.032

Annular Material

Depth from Surface Feet to Feet	Fill	Description
0	50	Cement
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Name Weeks Drilling & Pump Company

Person, Firm or Corporation

P.O. Box 176SebastopolCA 95473Signed June Angiolini Address _____ City _____Date Signed 9/26/16 State CA Zip 95473

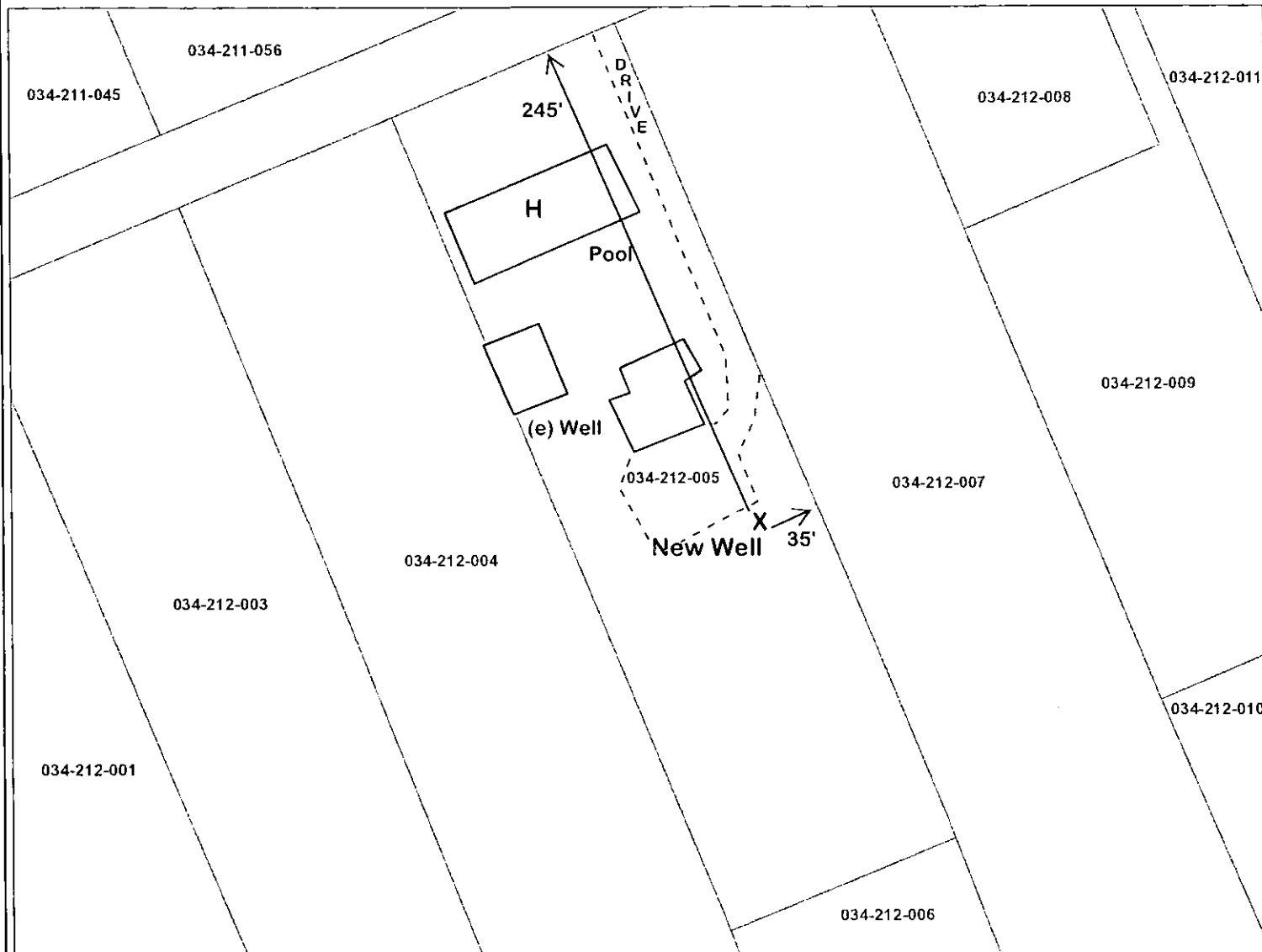
C-57 Licensed Water Well Contractor

C-57 License Number _____



1125 Darms Lane, Napa

APN #034-212-005



Legend

- ☐ Parcels
- ☐ County Boundary

188.1 0 94.04 188.1 Feet

Disclaimer: This map was prepared for informational purposes only.
No liability is assumed for the accuracy of the data delineated hereon.

This map was printed on 9/27/2016

Notes