



RICHARD C. SLADE & ASSOCIATES LLC

CONSULTING GROUNDWATER GEOLOGISTS

MEMORANDUM

May 21, 2024

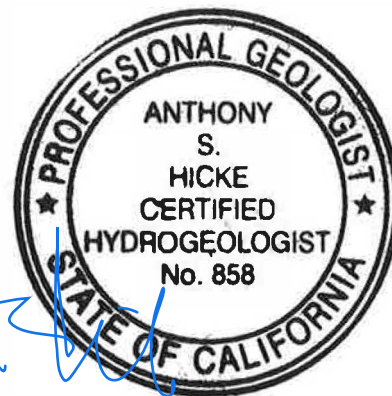
RCS Job No. 642-NPA02

To: Mr. Antoine Donnedieu de Vabres
General Manager - Eisele Vineyard
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From: Anthony Hicke and Edward Linden
Richard C. Slade & Associates LLC (RCS)

Re: Results of Napa County Tier 1 and Tier 3 Water Availability Analyses
for a Winery Expansion Project at
Eisele Vineyard (APN 020-340-030)
2155 Pickett Road, Calistoga, CA 94515



Introduction

This Memorandum presents the key RCS findings, conclusions, and preliminary recommendations regarding a Water Availability Analysis (WAA) for a proposed winery expansion project at Eisele Vineyard (the subject property), located at 2155 Pickett Road, in the Calistoga area of Napa County, California. RCS understands the proposed project is to expand the production of the existing winery. This document was prepared on behalf of the property owner, Eisele Vineyard, to provide hydrogeologic analyses pertaining to the proposed winery expansion project in conformance with applicable requirements of Napa County's WAA Guidelines (2015), and it was also prepared in conformance with recent updates to those Guidelines by Napa County (2022a & 2024a). A summary of the three WAA Tiers and their applicability to the proposed winery expansion is as follows:

- A "Tier 1" WAA ("Groundwater Use for Napa County") consists of calculating an estimate of the annual groundwater recharge that occurs at the subject property and comparing that estimate to the proposed groundwater extractions at the property; a Tier 1 WAA is required for the proposed project (Napa County, 2024a).
- No offsite wells owned by others are known to exist within 500 feet of the project well, and no offsite natural springs used by others for water supply purposes are known to exist within 1,500 feet of the project well. Therefore, a "Tier 2" WAA ("Well & Spring Interference") is not required for the proposed project, according to Napa County WAA requirements (2015 & 2024a).



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- A “Tier 3” WAA (“Groundwater / Surface Water Interaction”) is required for County-approval of the proposed project because the project well is located within 1,500 feet of a “Significant Stream” (Napa County, 2024a; PBES & LSCE, 2023a & b). A Tier 3 WAA has thus been prepared to evaluate possible stream interaction that might be caused by pumping of project wells that are within 1,500 feet of a Significant Stream, as defined by Napa County. The requisite “Tier 3” WAA is presented in this Memorandum.

Background

A WAA was previously prepared by RCS for a vineyard expansion at the subject property in 2017 and was later accepted by Napa County (RCS, 2017). This Memorandum is an update of that previous WAA and has been prepared to reflect changes to the requirements for groundwater recharge calculations in WAAs, and the anticipated slight increase in groundwater extractions for winery use relative to current volumes. This Memorandum thus supersedes the 2017 document. In addition, the nomenclature for the onsite wells reflected in the 2017 WAA has been changed by the property owner, as follows:

Well Name in 2017 WAA		Current Well Name
Winery Well	→	Aguila Well
Winery Block Well	→	Syrah Well
Vineyard Well	→	Domestic Well

Site Conditions and Project Description

The subject Eisele Vineyard property is comprised by a single parcel identified by Napa County Assessor’s Parcel Number (APN) 020-340-030 located in the Calistoga area of Napa County; the assessed acreage the parcel in the February 23, 2024, version of the County’s GIS parcel layer is 162.23 acres (Napa County, 2024b). Figure 1, “Regional Map,” shows: the approximate boundary of the subject property (Napa County, 2024b) superimposed on a topographic map of the area (credits shown thereon); Napa County’s “Significant Streams” and “Significant Streams” 1,500-foot buffer areas (PBES & LSCE, 2023a & b); the local groundwater basin (DWR, 2021); and watersheds tributary to the Napa River (LSCE & MBK, 2013). Nearly the entire western half of the subject property, including the location of the project well, is within the 1,500-foot “Significant Stream” buffer area around Simmons Canyon Creek (referred to herein simply as “Simmons Creek”), which the County has defined as a “Significant Stream”.

Roughly 27% (43.80 acres) of the total land surface area of the subject property lies within the Napa Valley Subbasin of the Napa-Sonoma Groundwater Basin as defined by DWR Bulletin 118 (2021), whereas the remaining 118.43 acres are not within a DWR Bulletin 118 groundwater basin. Based on watersheds defined by LSCE & MBK (2013), the subject property is entirely contained within the Napa River Watershed at St. Helena (shown as the yellow and black boundary on Figure 1), which itself is contained entirely within the Napa River Watershed near Napa (denoted by the orange boundary on Figure 1).



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Figure 2, "Property Map", and Figure 3, "Geologic Map", show some of the same data that are shown on Figure 1, but add several additional data (depending on the Figure) that include the locations of:

- The proposed project well, known as the "Domestic Well";
- Two non-project Wells, known as "Syrah Well" and "Aguila Well";
- Tier 2 WAA buffer rings (500 feet and 1,500 feet) around the proposed project well (Domestic Well); and
- Several known and possible offsite wells – none of which are within 500 feet of the project well.

The locations of the known and possible offsite wells discussed herein were approximated using records retrieved from the County's Electronic Document Retrieval website (PBES, 2024), from the State Department of Water Resources Well Completion Report Database (DWR, 2024), the findings of the RCS site visit, and on RCS internal records. Documents obtained from the County's Electronic Document Retrieval website that were used to help identify the locations of offsite wells included State Well Completion Reports (WCRs, also known as "driller's logs") and well drilling permits issued by Napa County, among various other documents. Those documents were also reviewed for the locations of offsite springs, but none were discovered within 1,500 feet of the subject property. Note that the locations of offsite wells shown on the Figures of this Memorandum are not considered to be an exhaustive representation of all wells near the subject property; other offsite wells may also exist in the area that were not observed and/or were not represented in the County or DWR records reviewed. Furthermore, the wells that are shown may not exist at the locations shown, or they may not exist at all.

From communications with and review of data provided by Eisele Vineyard personnel, the project engineers (Mr. George Monteverdi of Monteverdi Consulting and Mr. Mike Muelrath of Applied Civil Engineering), and from the field reconnaissance visit by an RCS geologist to the subject property on December 14, 2023, the following key items were noted and/or observed (refer to Figure 2, "Property Map"):

- The subject property is currently developed with an office, a winery, a barn, residences, vineyard areas, a small garden, olive trees, and some landscaping. A pool formerly existed on the property, but it was reportedly removed in late 2022.
- The applicant intends to increase the production volume of the onsite winery by 50%, from 20,000 gallons per year (GPY) to 30,000 GPY.
- The subject property is situated along the northeastern margin of the Napa Valley, east of the city of Calistoga.
- Simmons Creek traverses the western portion of the subject property, where it flows in a southwesterly direction when adequate runoff is present for flow to occur.
- Three water-supply wells exist at the subject property, which are currently known as the "Domestic Well", the "Syrah Well", and the "Aguila Well".
- Surface water is currently the primary source of irrigation water supply to the vineyard, and a portion of the onsite landscaping.
- During the December 2023 site visit, Simmons Creek was observed by the RCS geologist to be dry at Creek Flow Observation Points C and D (see Figure 1).
- During the December 2023 site visit, the RCS geologist traveled along roads in the immediate vicinity of the subject property to identify possible locations of nearby, offsite wells. RCS refers to such work as a "windshield survey". During this survey, the RCS



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geologist attempted to identify possible offsite well locations by observing typical well-house enclosures, pressure tanks, storage tanks, power lines, or wellheads.

- Development on offsite areas surrounding the subject property consists of vineyards, wineries, and residences, with some undeveloped vacant areas.

Local Geologic Conditions

Figure 3, “Geologic Map”, depicts the types, lateral extents, and boundaries between the various earth materials mapped at ground surface in the region by others; this map was adapted from work by the California Geological Survey (Delattre & Gutierrez, 2013). The earth materials mapped at ground surface at and proximal to the subject property include the following, from geologically youngest to oldest:

Sedimentary deposits (map symbols Qhc, Qha, Qhf, and Qls)

These deposits consist of various terrestrial sediments that have been deposited since the Pleistocene geological epoch (since ~2.6 million years ago [mya]). The depositional environments of these sediments have been various terrestrial settings that include stream channels, alluvial fans, and other sloped areas (i.e., landslides^a); they are generally comprised by unconsolidated to poorly consolidated layers and lenses of sand, gravel, silt, and clay. Delattre & Gutierrez (2013) show alluvial fan deposits (Qhf) at ground surface in the lower elevation, more gradually sloped areas of the subject property, in the northern and western portions of the property; no other sedimentary deposits occur at ground surface within the boundary of the subject property, according to Delattre & Gutierrez (2013).

A document discovered amongst County records (PBES, 2024) associated with the subject property (Lowney Associates, 1991) contains limited information on the shallow geology of a portion of the subject property near the Aguila Well, where alluvium (Qhf) has been mapped by others at ground surface. Therein, detailed geologic logging by others is presented for three shallow (35 feet below ground surface [ft bgs]) monitoring wells drilled in the vicinity of the Aguila Well. According to that logging, the entire 35-foot (ft) depth of each borehole consisted of sediments typically associated with recently deposited alluvium, including sand, silt, clay, gravel, and cobbles. Lithified volcanic materials were not reported in any of those boreholes, demonstrating that the depth to the rocks of the Sonoma Volcanics (discussed below) is greater than 35 ft bgs in the vicinity of the Aguila Well. This finding agrees well with the mapping by others shown on Figure 3, and it also supports the likelihood that alluvial thickness in the vicinity of the subject property increases with distance from the surface contacts between Qhf and volcanic materials (Tstp and Tsrc, discussed below). Approximately 10 ft of alluvial materials were encountered below ground surface in the borehole of the Domestic Well (see “Sonoma Volcanics” discussion, below), and approximately 20 ft of alluvial materials were encountered below ground surface in the borehole of the Destroyed Well in the northern portion of the subject property (see Figures 2 & 3), but the driller’s log for the Syrah Well (included in Appendix) suggests that recent alluvial materials were not encountered in the borehole of the Syrah Well. These findings are essentially as expected, according to the geologic mapping by others shown on Figure 3. However, the actual thickness of alluvium beneath other portions of the subject property where present, is not known based on available data.

^a Note that it was not a part of our Scope of Hydrogeologic Services for this project to study, investigate, analyze, determine, or opine on the potential activity of any type of mass movement including, but not limited to, landslides and debris flows, and/or on the potential impact that any type of mass movement might have on any structures, wells, or other existing or future developments.



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Sonoma Volcanics (map symbols Tstp and Tsrc)

The earth materials belonging to the Sonoma Volcanics are Pliocene geologic-aged (deposited or emplaced ~5.3 to 2.6 million years ago) per Delattre & Gutierrez (2013), and these materials are known to include many varied types of volcanic materials. Exposed at ground surface and mapped by others within the boundary of the subject property wherever Qhf is not present is the Rhyolite of Calistoga (Tsrc), a geologic unit assigned to the Sonoma Volcanics. The other unit of the Sonoma Volcanics within the visible extent of Figure 3, the Tuff of Petrified Forest (Tstp), is not present within the boundary of the subject property. However, Tstp could possibly exist at some depth beneath the subject property, particularly towards the southern portion of the property.

Earth materials belonging to the Sonoma Volcanics tend to produce more groundwater where they are hard and highly fractured, where they are deeply weathered, or where the individual grains (clasts) are relatively large and the pore spaces between the grains are uncemented and well connected (in sedimentary and deeply weathered materials). Where such zones occur, these earth materials are considered the main water-bearing units in the region. In contrast, volcanic ash flows and deeply weathered volcanic tuffs tend to be fine-grained, clay-rich, and often have limited permeability; these fine-grained materials tend to only yield groundwater to wells at limited flow rates.

RCS was involved with the siting and design of the Domestic Well, which was constructed in 2009 by Huckfeldt Well Drilling, of Napa, CA (Huckfeldt). Review of the lithology reported by Huckfeldt reveals that the alluvial-type sediments were encountered in the borehole of the Domestic Well from ground surface to a depth of approximately 10 ft bgs, followed by various volcanic materials to a depth of 360 ft bgs. Therefore, based on our review of the lithologic descriptions provided by Huckfeldt, the Sonoma Volcanics are interpreted by RCS geologists to extend to a depth of at least 360 ft bgs in the vicinity of the Domestic Well. Prior interpretation of the earth materials encountered in the borehole of the Domestic Well suggested alluvial deposits extended to a depth of 55 ft bgs, but review of this WCR in combination with other nearby driller's logs suggests a shallower depth of alluvial deposits proximal to the Domestic Well.

Geologically Ancient Rocks (not within view of Figure 3)

At great depth below the ground surface of the subject property, underlying the Sonoma Volcanics, geologically ancient (at least several tens of millions of years old) rocks that comprise the regional bedrock are known to be present. These rocks belong to complex assemblages of earth materials known as the Great Valley Complex and the Franciscan Complex. These regional bedrock materials are generally considered to be non-water bearing, but they are not expected to play a direct role in the availability of groundwater to the Domestic Well, based on RCS's interpretations of the earth materials encountered in the borehole of the Domestic Well. However, it is possible that these geologically ancient rocks were encountered in the borehole of the Syrah Well at a depth of 250 ft bgs and perhaps even shallower based solely on RCS interpretation of the driller's descriptions of the earth materials recorded on the WCR for the well. However, that interpretation is unlikely because of the known location of this well and the geologic map patterns shown on Figure 3.



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Geologic Structure

Within the view of Figure 3, no faults^b or other geologic structures are visible (Delattre & Gutierrez, 2013). Another source for fault locations was also reviewed (USGS, 2020a), but faults depicted in that resource are not present within the view of Figure 3 either. It is not known if any geologic structures (faults, folds, etc.) that might exist in the vicinity of the subject property have any influence on groundwater flow (e.g., act as groundwater flow barriers).

Local Hydrogeologic Conditions

The earth materials described above can generally be classified into two basic categories, based on their relative capacity to store and transmit groundwater to wells. These two general categories are potentially water-bearing materials and potentially nonwater-bearing rocks, as follows:

Potentially Water-Bearing Materials

The Sonoma Volcanics, including some of the sedimentary deposits thereof, are considered by RCS to be the principal water-bearing materials beneath the subject property and its immediate environs, and to a lesser extent, the recent sedimentary deposits that in some places overlie the Sonoma Volcanics. As described above, based on the work of Delattre & Gutierrez (2013), the geologic unit belonging to the Sonoma Volcanics beneath the subject property is the Tuff of Petrified Forest, and possibly the Rhyolite of Calistoga, whereas the overlying, geologically younger sedimentary materials, where present, are alluvial deposits that consist primarily of unconsolidated to poorly consolidated gravel, sand, silt, and clay derived from the Sonoma Volcanics. These interpretations are based on RCS's interpretation of the earth materials encountered in the borehole of the Domestic Well, RCS's interpretation of driller's descriptions provided on WCRs and county logs for several nearby wells, and review of the descriptions of and map patterns of the earth materials mapped in the vicinity of the subject property in Delattre & Gutierrez (2013).

Tuff and ash flow deposits like the Tuff of Petrified Forest can exist as relatively hard, competent deposits (described as "welded"), or as softer, more friable deposits. Softer ash flows and deeply weathered volcanic tuffs tend to be fine-grained, clay-rich, and often have limited permeability; thus, these fine-grained ashy and tuffaceous materials are typically only capable of yielding groundwater to wells at limited flow rates. In hard volcanic materials like the Rhyolite of Calistoga, the occurrence and movement of groundwater tends to be controlled by the frequency, openness, and interconnectedness of the randomly occurring network of subsurface fractures that often exists in these rocks. In the overlying sedimentary deposits (i.e., Qhf), where present, the occurrence and movement of groundwater tends to be controlled by the intergranular porosity of the materials; the size and angularity of the individual grains; the degree of consolidation and cementation; and potentially numerous other factors. However, the limited thickness of the overlying sedimentary deposits in the vicinity of the subject property means that all but the shallowest wells are likely to produce water primarily or entirely from the underlying Sonoma Volcanics.

Potentially Nonwater-Bearing Rocks

This category includes the geologically ancient regional basement rocks, known to be present below the Sonoma Volcanics in the vicinity of the subject property. These diverse and geologically old rocks are well-cemented, well-lithified, and tend to exhibit very low

^b Our hydrogeologic work herein does not include any efforts to define or determine local seismicity; to define or determine the potential activity of any faults in the region; or to define or determine the potential for onsite fault rupture.



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permeability. Occasionally, localized conditions can allow for small volumes of groundwater to exist in these bedrock materials where they are sufficiently fractured, or where they are relatively more coarse-grained. However, even in areas with such potentially favorable conditions, well yields are often no more than a few gpm in these bedrock materials, and the water quality can be marginal to poor in terms of various naturally occurring groundwater constituents.

Local Groundwater Basin

Groundwater basin boundaries in California have been defined and designated by the State Department of Water Resources (DWR) in their Bulletin 118, "California's Groundwater", and were used to define groundwater basin boundaries for the purposes of Groundwater Sustainability Plan (GSP) preparation (LSCE, 2022). Figures 1 and 2 show the boundary of the local groundwater basin (the Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin) defined in DWR Bulletin 118 (2021), relative to the boundary of the subject property. Some of the western and northern portions of the subject property fall within the local groundwater basin, whereas the remainder of the property is not within a Bulletin 118 defined groundwater basin.

Key Construction and Testing Data for Active Onsite Wells

Two active wells, the Domestic Well and the Syrah Well, exist within the boundaries of the subject property at the approximate locations shown on Figures 2 and 3. A DWR Well Completion Report (WCR, or "driller's log") was acquired by RCS for the Domestic Well from Napa County PBES (2024), and a possible Napa County driller's log for the Syrah Well was acquired by RCS from that same source; these documents and the associated well drilling permits are included in the Appendix to this Memorandum. In addition, Ms. Mingot provided "Well Inspection Reports" by Ray's Well Testing Service Inc. (RWTS), of Sebastopol, CA; for these two active wells that are dated August 18, 2021; these well inspection reports are also included in the Appendix to this Memorandum.

Active Onsite Well Construction Data

Data derived from the WCR, Napa County driller's log, RCS field observations, and well inspection reports by RWTS on August 18, 2021, include the following:

- The wells were constructed in March 2009 (Domestic) and October 1986 (Syrah).
- The wells were constructed with casings set to depths of 350 ft bgs (Domestic) and 320 ft bgs (Syrah), with PVC casings of 8-inch nominal diameter (Domestic) and 5-inch nominal diameter (Syrah).
- The well casing perforations were interspersed between the depths of 90 ft bgs and 330 ft bgs (Domestic), and between 160 ft bgs and 320 ft bgs (Syrah).
- The sanitary seal depths in the wells are 56 ft bgs (Domestic) and 24 ft bgs (Syrah).

The earth materials encountered in the borehole of the Domestic Well belong primarily to the Sonoma Volcanics (see Figure 3), and the perforated casing intervals in the Domestic Well exist solely within rocks of the Sonoma Volcanics. Accordingly, groundwater directly accessible to the Domestic Well is derived exclusively from the Sonoma Volcanics. Groundwater directly accessible to the Syrah Well is likely also derived exclusively from the Sonoma Volcanics.



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Inactive Well Data

Limited data are available regarding the construction of the Aguila Well, which is reportedly inactive because it went “dry”. RCS suspects that this “dry” characterization is due to a combination of deep water levels and/or well efficiency issues coupled with a relatively shallow well (with respect to other onsite wells) by RCS in 2017. However, the source of that data is unclear, and the veracity of that depth is questioned. Thus, no reliable well construction depths are available for the Aguila Well. Eisele Vineyard personnel reportedly plan to abandon the Aguila Well in the future.

RWTS Well Inspection Report Pumping Data for Domestic Well

On August 18, 2021, RWTS monitored the pumping rate of the Domestic Well for a 4-hour period of time, using the existing installed well pumping equipment. A static water level (SWL) was not available from RWTS immediately preceding this pumping period because the well was reportedly already pumping. Selected measurements and equipment parameters reported by RWTS are as follows:

- The installed well pump was a 7.5-horsepower submersible pump, with an intake set at a depth of 210 ft below the top of the well casing (ft btoc).
- The flow rate throughout the 4-hour monitoring period was 55 gpm.
- The pumping water level (PWL) throughout the monitoring period was 210.8 ft btoc.

Groundwater Level Measurements by RCS Geologist During Recent Site Visit

During the December 14, 2023, site visit, the RCS groundwater geologist measured a SWL in each of the existing onsite wells, as follows:

- Domestic Well SWL: 115.3 ft bgs.
- Syrah Well SWL: 145.4 ft bgs.
- Aguila Well SWL: 66.1 ft bgs.

Water Use

Information and data supporting existing and proposed future water use was provided by Eisele Vineyard personnel, which were used by RCS to estimate historic water uses from 2012 to 2023. For the purposes of this Memorandum, some of the volumetric water use data presented in the 2017 RCS WAA have been reinterpreted to correct inconsistencies in that dataset that continued data collection have helped to better understand. Hence, the estimates of historic water use at Eisele Vineyard presented herein supersede those reported in the 2017 WAA.

According to Eisele Vineyard personnel, the current water demands of the onsite vineyards are met by a combination of surface water and groundwater; surface water is also used to help meet a portion of the onsite landscaping water demands. Since 2012, the onsite water demands that have not been met by surface water have been provided by the three onsite wells (Aguila Well, Domestic Well, Syrah Well). However, the relative contributions of these sources have varied over time due to several operational issues that were reportedly encountered. In 2021, issues arose with the operation of the Aguila Well, and water was trucked to the site from an offsite source as an emergency measure for a few months. Operational changes have been made to the system since that time, and no water has been trucked to the site from any offsite sources since 2021, and the Aguila Well is currently considered inactive.

Current onsite water demands that are not met by surface water are met by groundwater produced from the Domestic Well and, to a much lesser extent, by groundwater produced from the Syrah



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Well. These demands consist of domestic uses (office, winery, barn, residential), winery process water use, irrigation of limited garden and landscaped areas, minor demands of various small-volume onsite uses (e.g., filling of mobile water tanks for chemical applications), and some vineyard irrigation. A pool that was maintained with pumped groundwater used to exist onsite, but it was reportedly removed in late 2022 in the interest of water conservation. RCS is not aware of any other significant water uses at the subject property during the period of record.

RCS also understands that the dataset includes data affected by flowmeter operation and/or recordation issues, affecting the accuracy of the calculated historic volume of groundwater extracted from the onsite wells, as well as the determination of the volumes of water devoted to specific onsite uses. Reported flow meter readings have generally been recorded on at least a monthly basis, but flow meter readings were not recorded for every month during the period of record. Therefore, assumptions were made about the timing of some of the historic groundwater extractions, and some months and years may include flow that occurred during preceding or subsequent months or years.

Historic Winery Demands (Data for 2012-2023)

- Average demand of 0.57 AFY (with a range of 0.33 - 0.84 AFY)
 - Includes water for both winery process and winery domestic needs.
- Supplied exclusively by Aguila Well from 2012 through 2020.
- Supplied by Aguila Well, trucked water from offsite, and Domestic Well in 2021.
 - Move to Domestic Well caused by Aguila Well issues.
- Supplied exclusively by Domestic Well from 2022.

Thus, water demand by the winery has averaged approximately 0.57 AFY over the last twelve years, with a range of 0.33 to 0.84 AFY.

Historic Groundwater Production (Data for 2014-2023)

Peak overall groundwater production was recorded in 2021, during which the Domestic Well and the Syrah Well produced a combined total of 31.48 AF, whereas the sum of the average annual groundwater production from these currently active onsite wells is 8.67 AFY, as detailed below. Reliable meter data for the Aguila well are not available for 2021, so they are not included in the historic groundwater production estimates below.

Domestic Well Groundwater Production (Data for 2014-2021)

- Average production of 7.69 AFY (with a range of 1.75 - 23.95 AFY); peak in 2021
 - Consisted primarily of vineyard use.
- Production after 2021 not included in calculations due to metering issues.

Syrah Well Groundwater Production (Data for 2015-2023)

- Average production of 0.98 AFY (with a range of 0.00 - 7.53 AFY); peak in 2021
 - Consisted of supply to garden, some vineyard use, some landscaping, and miscellaneous uses.
- 2014 production not included in calculations due to likely metering issues.
- Note that groundwater pumped from the Syrah well is non-potable and non-treatable, and therefore cannot be used (and has not been used) to meet potable demands.



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Proposed Groundwater Demands

Proposed groundwater demands from the subject property are detailed below, based on data and projections provided by and communications with Eisele Vineyard personnel. Proposed (future) onsite uses of groundwater will consist of winery use (domestic and process water), non-winery domestic use, non-potable use (garden, landscaping, minor miscellaneous), and possibly for supplemental vineyard irrigation.

Future demands for winery and non-winery domestic uses will continue to be met by groundwater pumped from the Domestic Well, as they have been for the past two years. As stated above, the groundwater produced from the Syrah Well is reportedly non-potable and non-treatable, so it cannot be used to meet those potable demands. Eisele Vineyard personnel have stated that they plan to only supply the onsite vineyards with surface water in the future, but that they may supplement the surface water supply to the vineyard with groundwater extracted from the Syrah Well and the Domestic Well, as necessary.

Project Demands (Winery Demands)

Eisele Vineyard personnel have estimated that increased operational efficiencies ("economy of scale") will allow for the proposed 50% increase in winery production to be realized with a less-than 1:1 increase in water demands by the winery. Groundwater use by the winery will increase by less than approximately 25% relative to current volumes, as estimated by Eisele Vineyard personnel. As described above, the peak annual winery demand on record was 0.84 AF. A 25% increase relative to that peak demand volume would result in annual average winery use of 1.05 AFY (increase of 0.21 AFY), which is the proposed total volume of groundwater use for the subject winery project.

Project water demands are proposed to be met exclusively by the Domestic Well. A reclaimed water system may be implemented in the future as part of the proposed winery expansion. If this reclaimed water system is implemented, use of reclaimed water to meet non-potable demands would help to offset the slightly increased groundwater extractions that have been estimated for the winery. However, to estimate future groundwater demands more conservatively, any water supply that might become available from this potential future reclaimed water system is not being considered in the calculations herein.

Non-Project Demands

The non-project groundwater demands at the subject property are non-winery domestic use, some landscaping, and possibly some supplemental vineyard irrigation. These demands have recently been met by the Domestic Well and the Syrah Well. The volumes of groundwater required by these non-project demands are not anticipated to change with implementation of the proposed project. For the purposes of this WAA, it is assumed that the Syrah Well will produce the peak historic volume described above, of 7.53 AFY (i.e., groundwater extractions from the Syrah Well will not increase). It is also assumed that the Domestic Well will produce the peak historic volume described above (23.95 AFY), along with the 0.21 AFY increase required for the winery expansion for a total annual extraction of 24.16 AFY.

Estimated "Maximum" Annual Groundwater Demands at the Subject Property

Based on the discussion above, the estimated annual groundwater extractions from the subject property to meet the proposed future uses of groundwater are not expected to exceed 31.69 AFY (24.16 + 7.53 AFY). However, the actual volume of groundwater needed to meet these future demands is likely to be considerably lower because these estimates were based on peak historic



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groundwater demands, and assumptions of supplemental vineyard irrigation, rather than average demands. Hence, 31.69 AFY is considered herein to be the “maximum” groundwater demand of for the property.

Domestic Well Demands

Future groundwater extractions from the Domestic Well are not expected to exceed 24.16 AFY, and may be considerably lower, depending on the actual volume of water used for supplemental vineyard irrigation, if any, in a given year. Hence, 24.16 AFY is considered the “peak demand” required from the Domestic Well during any given year.

The seasonality of future groundwater extractions from the Domestic Well have been estimated based on historic data provided by Eisele Vineyard personnel. Based on those data, 78% of the historic groundwater demands that have been provided by the Domestic Well have occurred between the months of May and November.

Syrah Well Demands

Future groundwater extractions from the Syrah Well will not exceed 7.53 AFY, representing a “no-net-increase” condition from the Syrah Well, because historic water use has been recorded to be 7.53 AFY at its highest. These future extractions are expected to only consist of non-potable uses (garden use, some landscaping, minor miscellaneous uses, and possibly some supplemental vineyard irrigation).

Aguila Well Demands

Future extractions from the Aguila Well are assumed to be zero because it is inactive and considered by Eisele Vineyard personnel to be non-operational. Furthermore, Eisele Vineyard personnel reportedly plan to abandon the Aguila Well in the future.

Proposed Pumping Rates from Project Well^c

The water demands placed on the Domestic Well are expected to vary throughout the year, so an estimate of the “peak demand” is considered below to help-assess the water supply needed to meet the peak pumping rate demands of this well, rather than assuming that production would be evenly distributed throughout the year. August has been the month with the highest average demand for the Domestic Well, based on historic records. On average, from 2014 through 2021, 17% of the water produced by the Domestic Well has been extracted during the month of August. 17% of the estimated peak demand to be provided by the Domestic Well (24.16 AFY) is 4.11 AF.

The peak pumping rate required from this well was estimated as follows, assuming the project well (Domestic Well) is pumped on a roughly 58% operational basis (14 hours per day) during the historic peak demand month of August:

- Peak Domestic Well Demands (4.11 AF in August) - To meet these demands, the project well will need to provide groundwater at a rate of about 51.4 gpm during the historic peak demand month of August, if pumped for 14 hours per day. During other months of the year, water demand from the Domestic Well is expected to be lower, based on historic average monthly production from this well.

^c Demands from the Syrah and Aguila well will not increase, and they are not project wells, so they are not considered in this estimate of pumping rates.



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As evidenced by the pumping rate determined by RWTS for the Domestic Well (discussed above), this well is capable of pumping at 55 gpm, which is greater than the peak demand rate of 51.4 gpm estimated for the Domestic Well.

Tier 1 WAA – “Groundwater Recharge Estimate”

Napa County promulgated additional guidelines for WAA preparation with respect to groundwater recharge calculations in response to the Governor’s Executive Order N-7-22 (Napa County, 2022a & 2024a) and the drought^d in the State at that time. For projects that require a WAA and are located outside of the Napa Valley Subbasin of the Napa-Sonoma Valley Groundwater Basin, the County requires that the average annual volume of groundwater recharge be calculated on a parcel-specific basis. The County also requires that parcel-specific groundwater recharge estimates used in WAAs for projects outside of the Napa Valley Subbasin consider “average rainfall” to be the average annual rainfall that has occurred in the last 10 water years, such as defined in the County’s 10-year average precipitation dataset (PBES & LSCE, 2022). Conversely, allowable groundwater extractions for properties within the Napa Valley Subbasin are to be calculated as 0.3 AFY of allowable groundwater extractions for each assessed acre of the subject property, according to current requirements (Napa County, 2015 & 2024a).

As described above, 27% of the 162.23-acre subject property is within the local groundwater basin, whereas the remaining 73% falls outside of the basin. Based on these spatial relationships between the subject property and the groundwater basin, two calculations were necessary to estimate an average annual groundwater recharge volume for the property: one for the portion of the subject property that is within the groundwater basin, and a separate parcel-specific groundwater recharge value for the portion of the property that is outside of the groundwater basin. The sum of these calculations represents the average annual volume of groundwater recharge at the subject property, calculated in accordance with current Napa County requirements (2015 & 2024a), and represents the allowable volume of groundwater extraction from the subject property.

Groundwater Recharge Estimate Within Groundwater Basin

Multiplication of the 43.80-acre portion (27%) of the subject property that falls within the groundwater basin by the 0.3 AFY/acre County-designated coefficient results in an allowable groundwater extraction total of 13.14 AFY for the portion of the property within the groundwater basin.

Parcel-Specific Precipitation (Outside of Groundwater Basin)

Spatial analysis of the County’s 10-year average rainfall data set (PBES & LSCE, 2022) determined that the area-weighted average rainfall for the 10-water-year period of 2012 to 2021 within the 118.43-acre portion (73%) of the subject property that is outside of the groundwater basin is 2.75 ft (33.0 inches). Multiplying this rainfall average by the 118.43-acres of the property outside of the groundwater basin results in a total of 325.68 AFY. This value is the average volume of rainfall received by the portion of the subject property that is outside of the groundwater basin each water year, in accordance with the County’s current 10-year (Water Years 2012 to 2021) average methodology.

^d A “prolonged drought analysis” is no longer required for WAA preparation due to the required use of the 10-year annual rainfall average or the unit groundwater use of 0.3 AFY/acre (Napa County, 2022b).



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Parcel-Specific Groundwater Recharge (Outside of Groundwater Basin)

Groundwater recharge on a long-term average annual basis on the portion of the subject property that is outside of the groundwater basin can be estimated as a percentage of the average rainfall that falls on this portion of the property and undergoes deep percolation, ultimately becoming groundwater within the underlying aquifer system. The actual percentage of rainfall that undergoes deep percolation is a function of numerous local and regional conditions, including ground surface slopes; soil types; ground cover; evapotranspiration; and the frequency, intensity, and duration of rainfall, among other possible factors.

Estimates of groundwater recharge as a percentage of rainfall were presented for several watersheds that are tributary to the Napa River in LSCE & MBK (2013). A local subset of those same watershed boundaries is depicted on Figure 1 of this Memorandum. The local subwatershed that contains the subject property is referred to by LSCE & MBK (2013) as the "Napa River Watershed at St. Helena". As noted above, the Napa River Watershed at St. Helena is entirely contained by the Napa River Watershed near Napa. On Table 8-10 of LSCE & MBK (2013), referred to thereon as "Recharge (% of Precip.)", the deep percolation rate for the Napa River Watershed near Napa is 17%, whereas the deep percolation rate for the Napa River Watershed at St. Helena is 14%. To present a more conservative analysis for the purposes of this Tier 1 WAA, the lower deep percolation rate of 14% for the Napa River Watershed at St. Helena was selected, as it represents a smaller portion of the larger watershed in which the subject property is located.

Multiplication of the 14% groundwater recharge rate in LSCE & MBK (2013) with the average volume of rainfall received by the portion of the subject property outside of the groundwater basin each water year (325.68 AFY) results in a parcel-specific average groundwater recharge rate of 45.60 AFY for that portion of the property, by the County's current 10-year precipitation average methodology.

Effect of Slope on Groundwater Recharge Potential (Outside of Groundwater Basin)

Any estimate of the percentage of rainfall entering an aquifer system via deep percolation that is reliant upon on estimates of rainfall, evapotranspiration, and surface water outflow over an entire watershed, such as the estimates provided by LSCE & MBK (2013), inherently includes the effects of ground surface slope. To provide a more site-specific estimate of the potential effects of ground slope on groundwater recharge over the portion of the subject property that is outside of the groundwater basin, an analysis of ground surface slope has been included in this Tier 1 WAA.

Many basic geologic references assume that recharge potential is reduced on steeper slopes because steeper slopes tend to increase surface water runoff rates and less time is therefore available for rainfall to percolate (infiltrate) into the ground before running off as surface flow. Page 56 of LSCE & MBK (2013) asserts that deep percolation recharge from rainfall is "significantly reduced" for land areas with slopes angles (inclinations) $>30^{\circ}$. On page 11 of LSCE & MBK (2013), an assessment of slope angles $>30^{\circ}$ is also mentioned, and this was attributed to a prior LSCE report, namely "LSCE 2011" therein; that document is likely to be the reference listed as "2011a" on page 134 of LSCE & MBK (2013). LSCE (2011) states on page 29 that "areas in which the slope of the land surface exceeds 30 degrees, beyond which recharge potential is significantly reduced". No other references or data are presented in any of the above-referenced documents to quantify the qualitative description of "significantly reduced". Because the various factors that affect groundwater recharge are likely interrelated (Yeh et al., 2009), assigning a value to define the amount that recharge is diminished as a function of slope is extremely difficult. No references were reviewed by RCS that quantify the possible reduction of deep percolation that might occur as a function of ground surface slope angle.



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The watershed-wide estimates of the deep percolation rate of rainfall for the Napa River Watershed at St. Helena were based on water balance calculations that considered rainfall throughout the entire watershed (LSCE & MBK, 2013), which inherently include all slopes within the watershed, including those $>30^\circ$. For the purposes of this WAA Memorandum, and to provide a more conservative and site-specific estimate of groundwater recharge for the subject property outside of the groundwater basin, it has been assumed that deep percolation at the subject property does not occur on areas with slopes $>30^\circ$, and that rainfall on the areas with slopes $>30^\circ$ would leave the property through some other process (e.g., surface runoff, evapotranspiration, etc.).

Spatial analysis of a U.S. Geological Survey (USGS) digital elevation model (2020c) determined that 95% of the ground surface of the subject property outside of the groundwater basin is sloped at $\leq 30^\circ$, with the remaining 5% sloped $>30^\circ$. Therefore, based on the preceding discussion of deep percolation rate as a function of ground surface slope, groundwater recharge over the portion of the subject property outside of the groundwater basin was reduced by 5% to account for the steeply sloped portions of the property; again, this conservatively assumes that no groundwater recharge occurs on the steeply-sloped portions of the property. The resulting groundwater recharge rate is 43.32 AFY, which represents the volume of groundwater recharge that is assumed to occur over the portion of the subject property that is outside of the groundwater basin.

Site-Wide Estimated Groundwater Recharge

Based on the calculations presented above, the total annual average groundwater recharge at the subject property can be calculated as the sum of the groundwater recharge on the portion of the subject property within the groundwater basin (13.14 AFY) and the groundwater recharge on the portion of the subject property outside of the groundwater basin (43.32 AFY). This total, 56.46 AFY, is therefore the volume of groundwater that can be extracted annually from the subject property, according to the County's current WAA requirements (2015 & 2024a). Because the annual groundwater extraction allowable under current Napa County requirements (56.46 AFY) is much greater than the anticipated maximum groundwater extraction from the property (31.69 AFY), the Tier 1 WAA conditions are satisfied for the proposed winery expansion project.

Tier 2 WAA – Review of Possible “Well & Spring Interference”

RCS reviewed publicly available records for evidence of offsite wells (PBES, 2024) and springs (PBES, 2024; USGS, 2023) near the subject property. This review did not reveal any known or possible active offsite wells within 500 ft, or offsite springs that are used for water supply purposes within 1,500 ft, of the location of the project well (Domestic Well). One or two offsite wells may exist within 500 ft of the Syrah Well, but a Tier 2 WAA is not necessary for the Syrah Well because: the Syrah well is not a project well, it does not supply groundwater to the subject winery, and groundwater extractions from the Syrah Well and the current uses of those extractions are not anticipated to change as a part of the proposed winery expansion project. Therefore, the Tier 2 WAA requirements for the proposed winery expansion project are presumptively met, and a Tier 2 WAA is not required for the proposed winery expansion project (Napa County, 2015 & 2024a).

Tier 3 WAA – Review of Possible “Groundwater/Surface Water Interaction”

Napa County has defined the rivers, streams, and creeks that it considers “significant” for the purposes of Tier 3 WAA review. These “Significant Streams” are defined in GIS data available from a County GIS data source, where they are referred to as “Significant_Streams” and “Significant_Streams_1500ft_Buffer” (PBES & LSCE, 2023a & b). According to the County's



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updates to WAA requirements (Napa County, 2024a), a Tier 3 WAA is required if a project well is located within 1,500 ft of a Significant Stream.

Figures 1 and 2 show the spatial relationship between the subject property and the nearby Significant Stream 1,500-ft buffer areas. Figure 2 also shows that approximately the western half of the subject property, including the location of the project well (Domestic Well), is within a Significant Stream 1,500-ft buffer area. Therefore, submission of a Tier 3 WAA is required for County-approval of the proposed winery expansion project (Napa County, 2015 & 2024a).

The Significant Streams 1,500-foot buffer area encompassing most of the subject property appears to have been generated around Simmons Creek. The headwaters of Simmons Creek in the Significant Streams dataset are located to the north of the subject property, in Simmons Canyon. Any surface water that might be present in Simmons Creek flows towards the southwest, ultimately entering the Napa River nearly one mile (5,173 ft) downstream of the subject property, measured along the flow path of the creek in the Significant Streams dataset.

In the 2023 USGS NHD (not shown herein), Simmons Creek is depicted in a more easterly location that better-coincides with the real-world flow path of the creek in the vicinity of the subject property, relative to the representation of Simmons Creek in the Significant Streams dataset. The Significant Streams version of Simmons Creek passes within 649 ft of the Domestic Well, whereas the 2023 USGS NHD version of Simmons Creek passes within 457 ft of this well.

Creek Flow Characteristics

According to Figure 6-123b of LSCE (2022) and the National Hydrography Dataset (USGS, 2023), Simmons Creek is classified as an intermittent stream near the subject property. Surface flow near the subject property in this creek is thus presumed to be intermittent, and any flows in the creek are only expected to be present during and shortly after proximal rainfall events upgradient in the watershed tributary to Simmons Creek. Regional rainfall tends to occur in the winter and spring. This characterization agrees well with a NCRDC report that described historical accounts of seasonal drying of Simmons Creek since at least the 1940s or 1950s (Koehler, 2002). RCS is not aware of any quantitative long-term historic surface water flow data for Simmons Creek. However, RCS was able to compile observations of flow proximal to the subject property at five locations (see Figure 1), spanning January 1990 through February 2024, with a total of 30 temporally distinct observations acquired from various sources (see Table 2). Most of these observations of creek flow were made at Creek Observation Point A by Eisele Vineyard personnel between September 2023 and February 2024, but additional observations were also acquired.

Through review of imagery available from the Google Maps "Street View" dataset (Alphabet, 2024), RCS was able to obtain several observations of historic surface water flows in Simmons Creek in the vicinity of the subject property. Simmons Creek is near enough to roads that certain Street View imagery could be used to qualitatively evaluate the flow condition of the creek at various points in time. One location slightly north of the subject property from which the flow condition of Simmons Creek can be evaluated is shown on Figure 1 as Creek Observation Point A. This observation point is located on a bridge along a road that spans Simmons Creek, with the assessed imagery oriented towards the northeast. However, only a single Street View imagery period is available at that location. Therefore, a different location from which more images of Simmons Creek were available in the Street View dataset was found, located 0.3 miles southwest of the subject property, looking north from a bridge on Silverado Trail that spans the creek (Creek Observation Point B on Figure 1), prior to its confluence with the Napa River.

Additional observations of flow in Simmons Creek were collected from various data sources including RCS onsite observations and additional observations by others at Creek Observation



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Point C, Creek Observation Point D, and at a location north of the subject property in Simmons Canyon. The locations of these various observations are shown on Figure 1, except for the Simmons Canyon location, which is located further upstream from Point A.

An additional observation of the status of Simmons Creek far downstream of the subject property was inferred from a June 2001 salmonid habitat survey by Koehler (2002). Koehler specifically stated that Simmons Creek flows were not measured, so this data point was inferred by RCS based on Koehler's reported observations. However, those observations of flow in Simmons Creek are probably not representative of flow in the creek in the vicinity of the subject property, because the transect of Koehler's survey of this creek was only conducted from the confluence with the Napa River, to 1,643 ft upstream from that location. Based on Koehler's transect, their survey ended roughly 0.7 miles downstream of the subject property, and less than half of the distance between Creek Observation Point B and the confluence of Simmons Creek with the Napa River. Based on Koehler's descriptions of the salmonid habitat, water was clearly present in the surveyed section of Simmons Creek at the time of their survey, and at least some flow was likely occurring at that time at that point far downstream of the subject property. Because of the distance between Koehler's transect and the subject property, the observations by Koehler should not be considered representative of the flow condition of the creek in the vicinity of the subject property at that time.

The qualitative creek conditions determined by RCS via review of Street View imagery and additional non-Street View observations are presented on Table 2, and a consolidated summary of the data shown on Table 2 is presented on Figure 4 (below). For each of the months with multiple available observations (October 2023 through February 2024), the flow conditions observed were consistent across each of the observations within a given month of a year. This finding of consistent in-month flow conditions was used as the basis for creation of Figure 4, which was created to remove the temporal biasing that would have otherwise resulted from inclusion of multiple observations from a given month of a year. As an example, Table 2 shows a total of four observations for November (one from 2007 and three from 2023), but Figure 4 depicts a total of two creek flow observations for the month of November (one from 2007 and one from 2023). Each of the observations for November 2023 were the same (i.e., "Dry"), so those three observations were consolidated into a single "November" datapoint for the purposes of Figure 4. The percentage shown above each column identifies the percentage of months with observations when flow was observed in Simmons Creek (e.g., flow was only observed during one of the three Decembers = 33%). Other than the April 2019 observations that indicated flow in the creek, and the June 2001 observation by Koehler that is far downstream (and therefore not included in this analysis), the observations showing likely flow (or at least the presence of water in the Creek) were recorded between December and February.

Based on these observations, the portion of Simmons Creek near the subject property tends to be dry from May through November (i.e., the dry season), and flow in the creek is only present during the portion of the year that experiences significant precipitation (i.e., the wet season). It is thus likely that flow in Simmons Creek in the vicinity of the subject property is controlled by direct precipitation and surface water runoff, and that the occasionally present flow is probably disconnected from groundwater that is accessible to the project well (Domestic Well), discussed further below.



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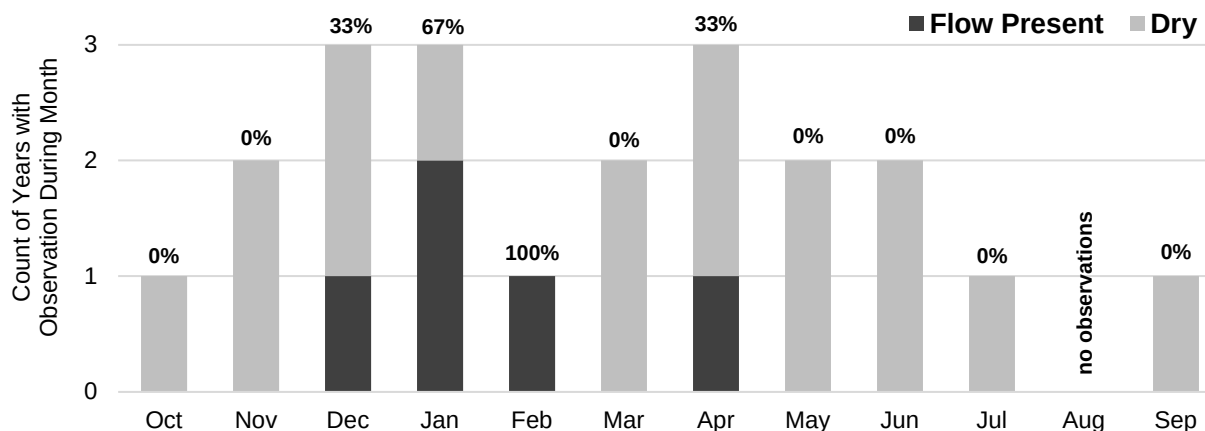
Table 2 – Qualitative Creek Flow Observations

Date	Point A (Upstream)	Point B (Downstream)	Point C (Upstream)	Point D (Onsite)	Simmons Canyon (Upstream)
1/1990	--	--	--	Dry (NCDEM)	--
11/2007	--	Dry (SV)	--	--	--
5/2011	--	Dry (SV)	--	--	--
6/2012	--	Dry (SV)	--	--	--
4/2013	--	Dry (SV)	--	--	--
5/2014	--	Dry (SV)	--	--	--
7/2015	--	Dry (SV)	--	--	--
4/2016	--	Dry (SV)	--	--	--
12/2016	--	Dry (SV)	--	--	--
3/29/2017	--	--	--	Dry (RCS)	--
4/2019	Significant Flow (SV)	Very Low Flow (SV)	--	--	--
12/13/2019	--	--	--	--	Flow (RCS)
1/24/2020	--	--	--	--	Flow (RCS)
3/2021	--	Dry (SV)	--	--	--
6/2023	--	Dry (SV)	--	--	--
9/29/2023	Dry (EV)	--	--	--	--
10/16/2023	Dry (EV)	--	--	--	--
10/31/2023	Dry (EV)	--	--	--	--
11/9/2023	Dry (EV)	--	--	--	--
11/15/2023	Dry (EV)	--	--	--	--
11/22/2023	Dry (EV)	--	--	--	--
12/5/2023	Dry (EV)	--	--	--	--
12/11/2023	Dry (EV)	--	--	--	--
12/14/2023	--	--	Dry (RCS)	Dry (RCS)	--
1/8/2024	Low Flow (EV)	--	--	--	--
1/22/2024	Significant Flow (EV)	--	--	--	--
1/26/2024	Moderate Flow (EV)	--	--	--	--
2/8/2024	Moderate Flow (EV)	--	--	--	--
2/21/2024	Significant Flow (EV)	--	--	--	--
2/22/2024	--	--	Significant Flow (PPI)	--	--

-- = imagery not available at Observation Point

Definitions: NCDEM = Napa County Department of Environmental Management (in Lowney & Associates, 1990);
SV = Street View; EV = Eisele Vineyard Personnel

Figure 4 – Summary of Qualitative Creek Flow Observations





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Napa Valley Subbasin Groundwater Sustainability Plan

In Section 6, “Groundwater and Surface Water Conditions”, of the Napa Valley Subbasin Groundwater Sustainability Plan (LSCE, 2022), a discussion of the hydraulic connection of groundwater and creeks within the County is presented, as simulated by computer modeling. Figure 6-123b therein shows the “average annual hydraulic connection” of creeks (LSCE, 2022). On that Figure, Simmons Creek is shown as “intermittent”, and without any “simulated average annual hydraulic connectivity” along the length of the stream in the vicinity of the subject property. The nearest portion of Simmons Creek on Figure 6-123b with any “simulated average annual hydraulic connectivity” is 0.9 miles downstream of the project well (distance measured along the Significant Stream), proximal to the confluence of Simmons Creek with the Napa River. Thus, based on review of Figure 6-123b of LSCE (2022), surface water in Simmons Creek, when present, is not hydraulically connected to underlying groundwater. Note that the small portion of Simmons Creek that reportedly has some amount of “simulated average annual hydraulic connectivity” on Figure 6-123b (LSCE, 2022) comprises a significant portion of the transect of Simmons Creek by Koehler (2002), supporting the prior assertion that the Koehler observation is not representative of conditions in the portion of the Creek near the subject property.

Timing of Groundwater Use

Based on the observations presented above, the section of Simmons Creek proximal to the subject property is dry for most of the year, and this portion of the creek has been shown to be consistently dry between the months of May and November. This period coincides with the majority of groundwater extractions that are expected to occur from the project well (the Domestic Well). Therefore, even if considering a theoretical, unrealistic scenario that some sort of hydraulic connection did exist between the intermittent flows in Simmons Creek and the groundwater accessible to the Domestic Well, surface water flows have tended to occur in the winter and spring, when the majority of groundwater extractions from the Domestic Well have occurred in the summer and fall. Hence typical pumping of the Domestic Well in this unrealistic scenario would not affect flows in Simmons Creek.

Hydrogeology

To demonstrate the subsurface hydrogeologic conditions beneath the subject property, Figures 5 and 6 were prepared for the purposes of this Tier 3 WAA. Figure 5 (attached) is a scaled schematic cross section that depicts the RCS-interpreted hydrogeologic conditions along the section alignment, whereas Figure 6 (below) is a hydrograph of water levels in the Domestic Well. The horizontal alignment of the cross section can be seen on Figure 3 and was selected such that it intersected the Domestic Well and the most proximal portion of Simmons Creek found in the Significant Streams dataset.

Figure 5 shows key construction details of the Domestic Well along with several water level depth measurements for the Domestic Well, and several surface features intersected by the alignment. The data and interpretations presented on Figure 5 were derived from the WCRs of onsite and nearby wells (PBES, 2024; DWR, 2024); from the geology of Delattre & Gutierrez (2013); from well inspection and testing data provided by the property owner and available in RCS’s in-house records; from a high-resolution DEM (USGS, 2020b); and from RCS’s work on other parcels. Figure 6 was prepared from data that were compiled from several sources that include the WCR for the Domestic Well, initial pumping tests of the well, RCS site visits, and measurements provided by Eisele Vineyard personnel.

Among the notable features on Figure 5 is the topographic low near of the Significant Streams location of Simmons Creek, which was derived from a high-resolution DEM (USGS, 2020b). This



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topographic low is interpreted to represent the actual bed of Simmons Creek in which flow occurs, when present. Along the horizontal alignment of A-A', the actual location of the creek bed is roughly 189 ft closer to the location of the Domestic Well than the trace of Simmons Creek that is mapped in the Significant Streams dataset. This creek bed location is also 7 ft lower in elevation than the intersection of Simmons Creek in the Significant Streams dataset and A-A'. All discussions and elevation measurements/comparisons related to the cross section presented herein are based on the creek bed topographic low along A-A' derived from the USGS DEM (2020b), thereby presenting a more conservative analysis than if the discussions and elevation measurements regarding Simmons Creek were based on the alignment of this creek in the Significant Streams dataset.

Figure 6 – Domestic Well Groundwater Elevations

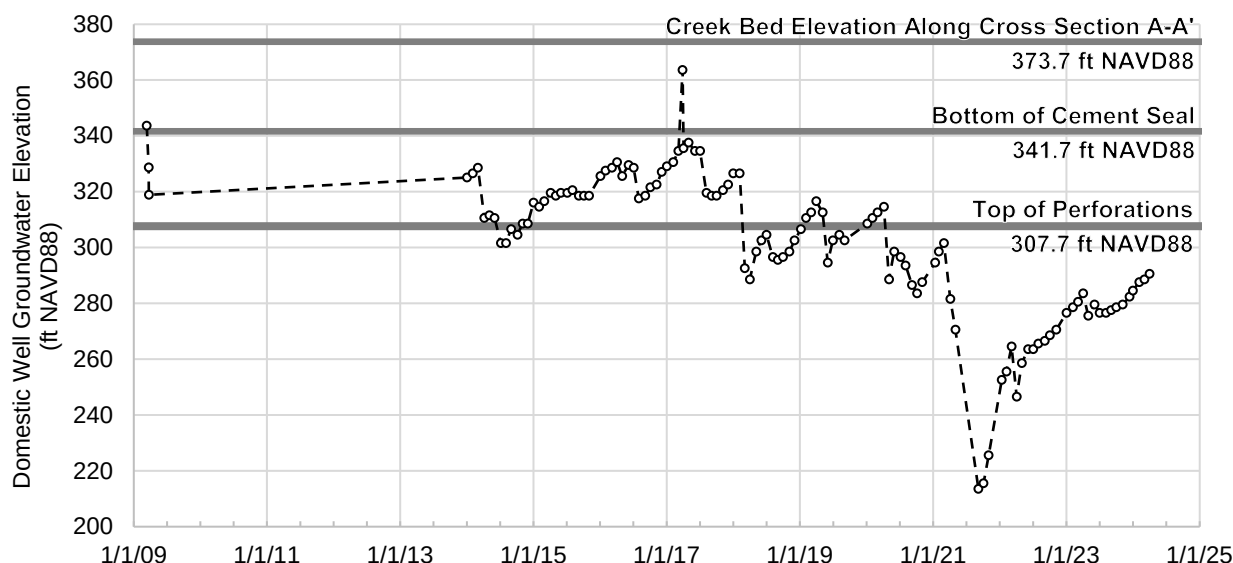


Figure 6 shows the general trend in water levels over time in the Domestic Well. Leading up to early 2021, an overall gradual decline in water levels was recorded, followed by an ongoing period of recovery. Due to intensive pumping of this well during 2021, it is likely that the three deepest water levels in the second half of 2021 were PWLs or partially recovered water levels.

An unexpected change in water levels occurred in January 2018, at a time when the Domestic Well was not reported to be pumping significant volumes of water. The cause for this sudden drop is unclear, but it is possible that measurement issues, changes in measurement equipment, or inconsistencies either preceding or subsequent to this change may be to blame. RCS cannot verify the accuracy of many of the water levels provided by Eisele Vineyard personnel, but the trend of recent water levels provided to RCS closely matches the December 2023 measurement by the RCS groundwater geologist (shown on Figure 6). The water level decline through 2021 was likely caused at least in part by the drought conditions that occurred during that period of time. Increased groundwater extractions to offset decreased availability of surface water also likely contributed to the water level decline, likely exacerbating the decline in water levels in the well. However, recent increases in rainfall have increased the volume of regional groundwater recharge and surface water flows, resulting in rising groundwater levels in the Domestic Well. In addition, when average or above average rainfall is available, pumping of the Domestic Well for



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vineyard irrigation water is not expected to be required, allowing further water level recovery to occur in the well.

Figures 5 and 6 demonstrate several pieces of evidence that support the assertion that the groundwater accessible to the Domestic Well is hydraulically disconnected from the intermittently present surface water in Simmons Creek in the vicinity of the subject, as follows:

Differing Geologic Materials

The Domestic Well is solely perforated within the rocks of the Sonoma Volcanics (Tstp), whereas Simmons Creek flows on the alluvial fan deposits (Qhf) in the vicinity of the subject property. At the interface between these different earth materials, and/or any others that may also exist in between, there may be one or more low permeability layers/deposits where finer-grained and/or more consolidated materials are present. Detailed logging of three shallow boreholes proximal to the Aguila Well (Lowney Associates, 1991) revealed an approximately 20-ft thick region of low permeability sediments between the approximate depths of 15 and 35 ft bgs (referred to therein as "Stratum B"). This shallow low permeability region may act as an aquitard, reducing the potential for the effects of pumping groundwater from the deeper formations (from which the Domestic Well extracts groundwater) to reach or influence shallower groundwater.

Vertical Separation of Domestic Well Perforations from Creek Elevation

Relative to the elevation of the creek bed along A-A', the bottom of the cement seal of the Domestic Well is 28 ft lower in elevation, and the topmost casing perforations of the well are 66 ft lower in elevation. This vertical separation between the creek bed and both the cement seal and the casing perforations of the Domestic Well shows that for any water present in the creek to reach the depth of the uppermost perforated casing in the well, it would need to percolate through the creek bed and infiltrate 66 ft down through sediments and volcanic materials of various permeabilities. The cement seal, although shallower than the topmost casing perforations, further adds vertical separation between surface water and deep groundwater, by helping prevent vertical migration of water along the upper portion of the well casing.

Deep Groundwater Levels Compared to Creek Elevation

All water levels measured in the Domestic Well have been lower in elevation than the bed of Simmons Creek along A-A'. Figure 6 shows water level data primarily measured by the property owner, with some measurements collected by RCS, the well driller (Huckfeldt), and the contractor that performed pumping tests in 2009 (LGS Drilling, Inc of Vacaville, CA). The shallowest groundwater level measured in this well, measured by RCS on March 29, 2017, was 10 ft shallower than the creek bed, but this reading appears to be an anomaly when viewed alongside the other data on Figure 6. That shallow, anomalous reading was likely to have been an inaccurate measurement. The next-shallowest groundwater level measured in the Domestic Well was the initial post-construction water level measurement by Huckfeldt, which was 30 ft deeper than the elevation of the creek bed. The other groundwater elevations from the Domestic Well shown on Figures 5 and 6 were no less than 36 ft below the creek bed, and over the last several years (since March 2018), groundwater elevations in the Domestic Well have been at least 57 ft deeper than the creek bed. The significant differences between the elevation of the creek bed along A-A' and the water levels in the Domestic Well shown on Figure 6 demonstrate the existence of a substantial unsaturated zone (also known as a vadose zone) that vertically separates surface water in Simmons Creek from groundwater that is accessible to the Domestic Well.



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Tier 3 WAA Discussion

If a hydraulic connection between Simmons Creek and the underlying groundwater accessible to the Domestic Well did exist, the piezometric groundwater surface (i.e., the water level) in the Domestic Well would be expected to be at or above the elevation of the creek bed, and a thick unsaturated zone would therefore be absent. Instead, water level data indicate that the water level in the Domestic Well is always lower than the elevation of the Creek bed, no matter the time of year or flow status of Simmons Creek. The presence of a thick unsaturated zone between the bed of Simmons Creek and the groundwater that is accessible to the Domestic Well demonstrates that Simmons Creek can be classified as a disconnected stream (Winters et al., 1998) in the immediate vicinity of this well. A thick unsaturated zone exists between Simmons Creek and the underlying groundwater along A-A', so any surface water that might percolate through the bed of Simmons Creek would need to descend more than 30 feet before reaching the underlying groundwater aquifer accessible to the Domestic Well, providing clear evidence that Simmons Creek is disconnected from groundwater accessible to the Domestic Well in the vicinity of the subject property. This disconnection also demonstrates that the intermittent flow in the proximal portions of Simmons Creek occurs independently from the condition of the local aquifer system accessible to the Domestic Well.

Observations and data presented above demonstrate that the Domestic Well is not hydraulically connected to the intermittently present surface water in Simmons Creek. As shown on Figure F-2 "Decision Tree" in Napa County's 2015 WAA Guidance Document, and described in the accompanying text, the "Groundwater/Surface Water Evaluation is complete" because the project well (the Domestic Well) is not hydraulically connected to surface water(s).

Key Conclusions and Recommendations

1. The proposed project is to increase the production of the existing onsite winery.
2. The water demands of the project (i.e., the winery) will be met by groundwater pumped from the Domestic Well. No other water supply is proposed to provide water to the project.
3. Two additional wells exist onsite, but their current usages will not increase following implementation of the proposed project, and they do not supply groundwater to the project winery.
4. It is estimated that winery use would increase by roughly 25% over current demand levels. Compared to the peak annual winery demand on record (0.84 AF), a 25% increase relative to that peak demand volume would result in annual average winery use of 1.05 AFY, an increase in groundwater demand of 0.21 AFY.
5. Total onsite groundwater demands (including winery project extractions) following proposed expansion of the winery are not expected to exceed 31.69 AFY. Note that this groundwater extraction volume is not likely to be reached, because it is based on peak groundwater extractions that occurred during a year of limited surface water availability. In reality, it is anticipated that average annual groundwater extractions will be considerably lower, because groundwater use for vineyard irrigation, if any, is only expected to occur when surface water availability is limited.
6. Parcel-specific average annual groundwater recharge at the subject property was estimated to be 56.46 AFY. Hence, the proposed future maximum groundwater demand for the subject property (31.69 AFY) is only 56% of the parcel-specific average annual groundwater recharge (56.46 AFY) calculated herein. Therefore, the proposed project is compliant with Tier 1 WAA



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requirements (Napa County, 2015 & 2024) because proposed demand does not exceed parcel-specific groundwater recharge.

7. The pumping rate of the Domestic Well was monitored for four hours in August 2021 by RWTS, during which time the well reportedly continuously pumped groundwater at a rate of 55 gpm. This pumping rate is higher than the 51.4 gpm that is calculated to be required from the Domestic Well to meet the maximum anticipated groundwater demands of the property, inclusive of the increased demands of the proposed winery expansion.
8. Tier 2 WAA requirements have been presumptively met for the proposed project and the proposed project well. A Tier 2 WAA is not necessary for the proposed project because the project well is located greater than 500 feet from the known and possible locations of offsite wells, and greater than 1,500 feet from the locations of known and possible offsite springs that are used for water supply purposes (Napa County, 2015 & 2024).
9. The Domestic Well (i.e., the project well) is not hydraulically connected to Simmons Creek. This lack of hydraulic connection is demonstrated by the following:
 - a. The Napa Valley Groundwater Sustainability Plan depicts the section of Simmons Creek near the subject property without any "simulated average annual hydraulic connectivity" (LSCE, 2022).
 - b. The entire perforated casing section of the Domestic Well is constructed against the earth materials of the Sonoma Volcanics, whereas surface water flow in Simmons Creek is on alluvial deposits that are estimated to be several dozen feet thick below the bed of the creek, along the alignment of Cross Section A-A'.
 - c. The topmost section of perforated casing in the Domestic Well is 66 feet lower than the bed of Simmons Creek, measured along Cross Section A-A'.
 - d. Available water level data for the Domestic Well indicate that groundwater levels have been about 30 feet or more deeper than the elevation of the bed of Simmons Creek along the Cross Section A-A' alignment considered in this WAA.
10. In the immediate vicinity of the subject property, data reviewed suggest that surface water is only intermittently present in Simmons Creek, and that the presence of water in the proximal portions of the creek is probably controlled by direct precipitation and surface runoff. Any surface water that might be present in the creek is not controlled by the level of groundwater that is accessible to the Domestic Well, which only directly extracts groundwater directly from the rocks of the Sonoma Volcanics.
11. According to the Napa County 2015 WAA Guidance Document, the Tier 3 analysis has been satisfied because a lack of hydraulic connection between the Significant Stream (Simmons Creek) and the project well (the Domestic Well) has been demonstrated.
12. RCS recommends continued groundwater monitoring at the subject property, in all onsite wells. This should include the frequent, ongoing monitoring of static and pumping water levels in all onsite wells, and the monitoring of instantaneous flow rates and cumulative pumped volumes from the active onsite pumping wells. This should also include regular graphical review of collected monitoring data to evaluate conditions and to help determine if monitoring equipment is functioning as intended. Eisele Vineyard personnel report that additional flow meters have recently been installed on the Domestic Well to improve monitoring of groundwater use from that well.



MEMORANDUM

Closure/Disclaimer

This Memorandum regarding RCS's WAA for a proposed winery expansion project at Eisele Vineyard, in the vicinity of Calistoga, CA, has been prepared for Eisele Vineyard and applies only to the evaluation of the subject property for the requirements discussed herein. This WAA 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 conclusions or professional advice presented herein.

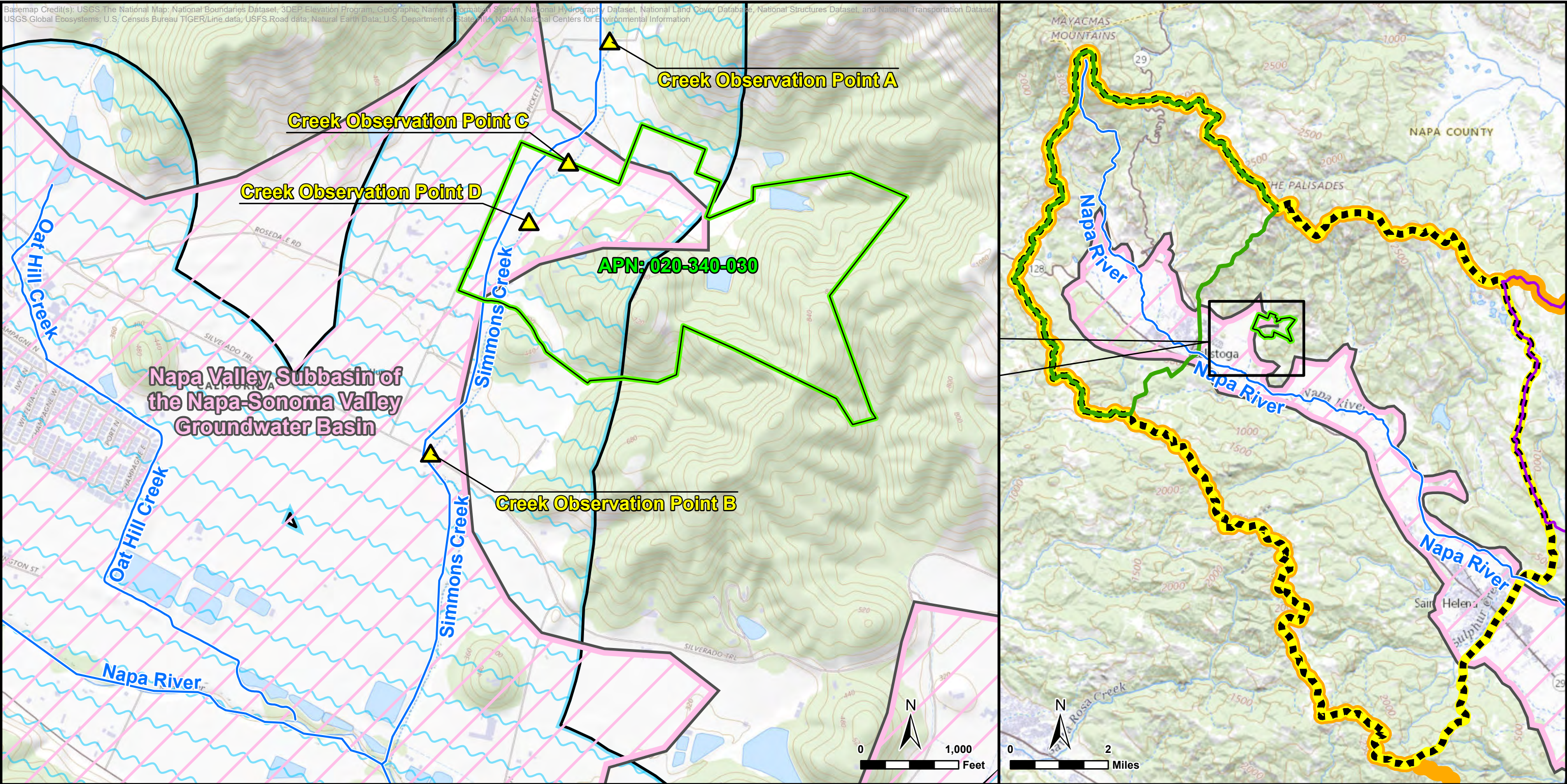


MEMORANDUM

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Basemap Credit(s): USGS The National Map; National Boundaries Dataset; 3DEP Elevation Program; Geographic Names Information System; National Hydrography Dataset; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road data; Natural Earth Data; U.S. Department of State; NOAA National Centers for Environmental Information



Subject Parcel (Napa County, 2024b)

Groundwater Basin Boundary (DWR, 2021)

Significant Streams (PBES & LSCE, 2023a)

Significant Streams 1,500-foot Buffer (PBES & LSCE, 2023b)

RCS Creek Observation Point

Watersheds in LSCE & MBK (2013)



Conn Creek Watershed

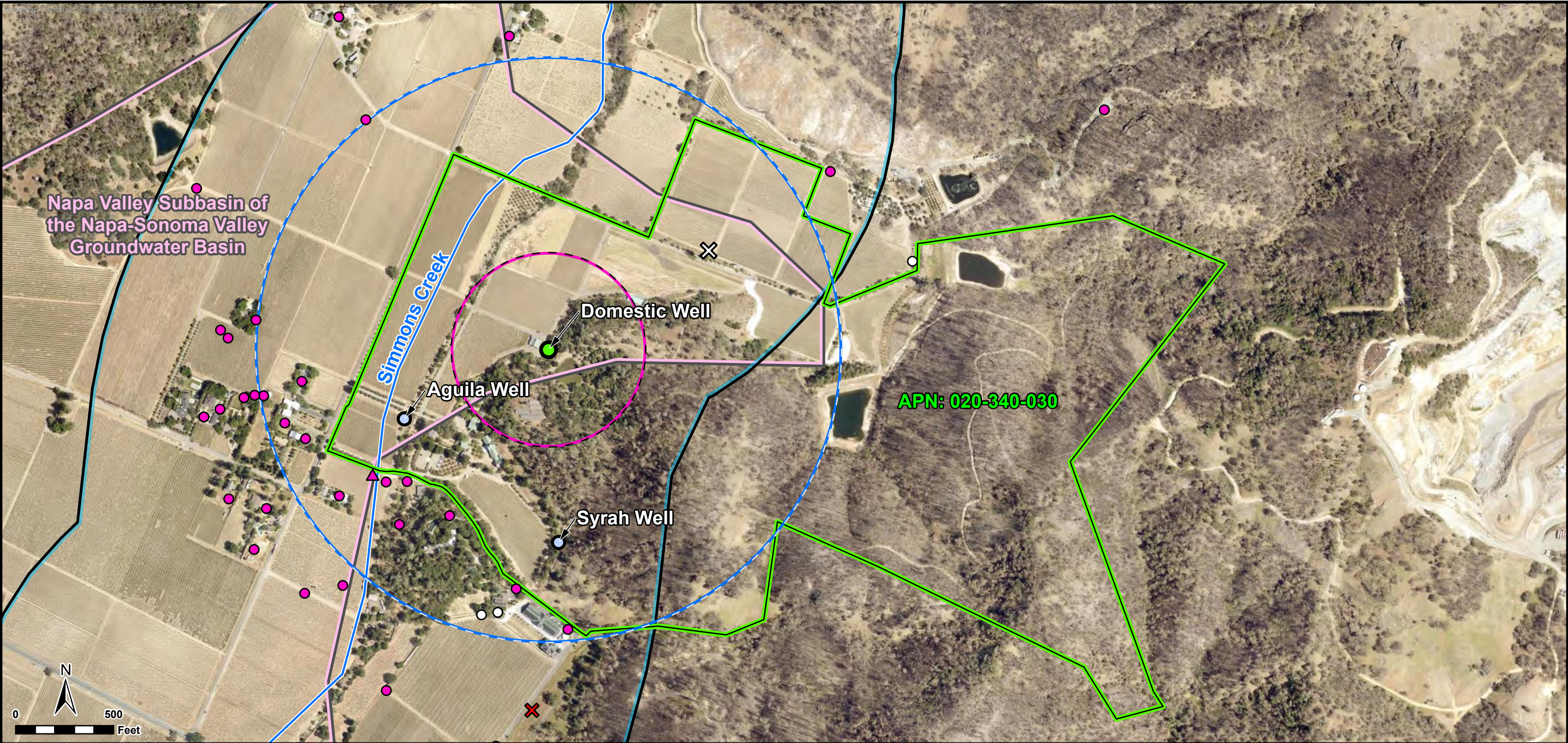
Napa River Watershed at Calistoga

Napa River Watershed at St. Helena

Napa River Watershed near Napa



**Figure 1
Regional Map**



Onsite Wells

● Project Well

● Non-Project Well

✕ Destroyed Well

○ 500-foot Buffer Around Project Well

○ 1,500-foot Buffer Around Project Well

Known and Possible Offsite Wells

● Known or Possible Offsite Well

○ Possible Offsite Well - Possibly Destroyed

▲ Possible Offsite Well - Capped

✕ Possible Offsite Dry Well

■ Subject Parcel (Napa County, 2024b)

— Significant Streams (PBES & LSCE, 2023a)

○ Significant Streams 1,500-foot Buffer (PBES & LSCE, 2023b)

○ Groundwater Basin (DWR, 2021)

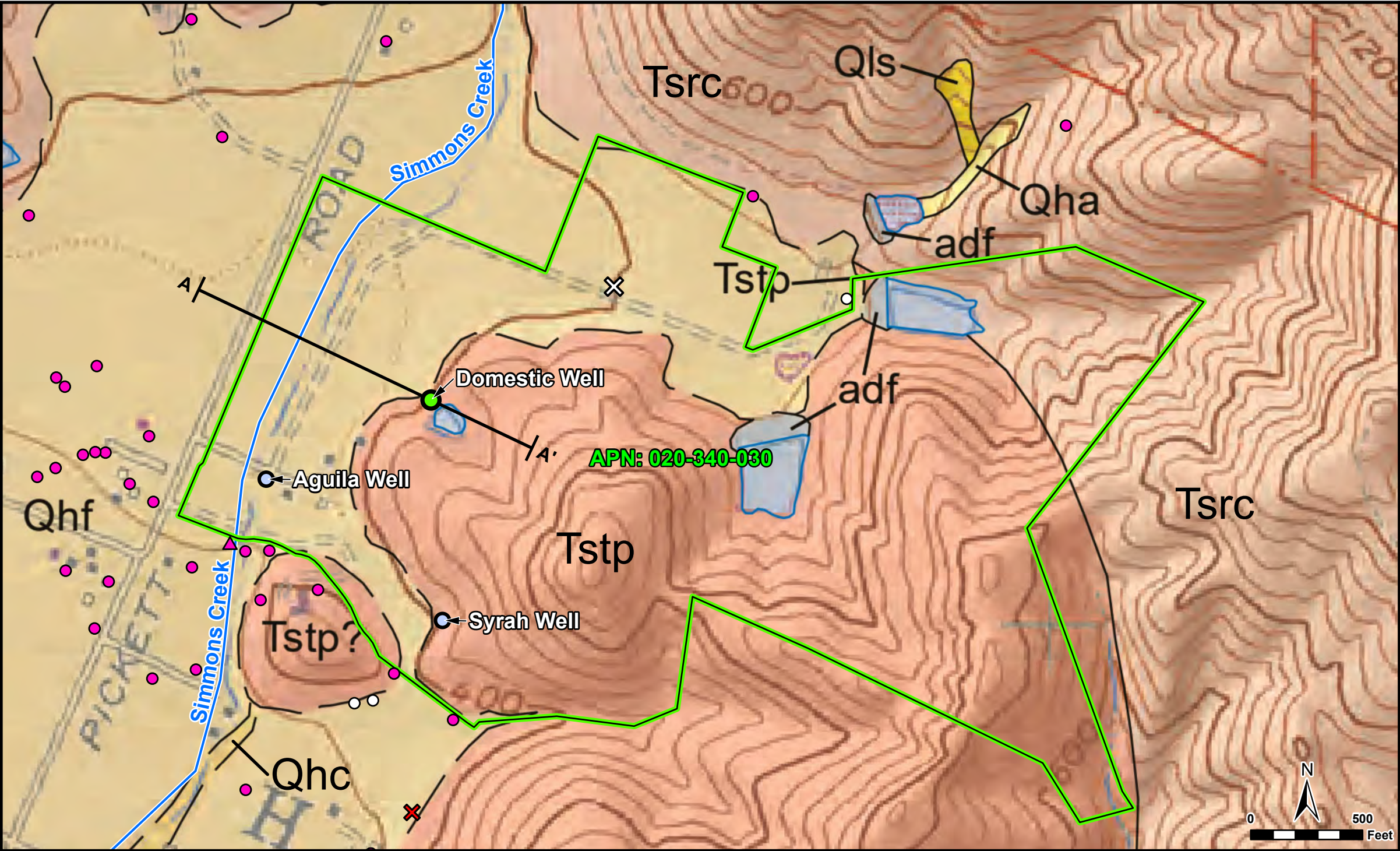


Figure 2
Property Map

Note: All locations shown are approximate.

RCS Job No. 642-NPA02

May 2024



GEOLOGIC LEGEND

Sedimentary Deposits

Qhc	Stream channel deposits (modern to latest Holocene)
Qha	Alluvial deposits, undifferentiated (Holocene)
Qhf	Alluvial fan deposits (Holocene)
Qls	Landslide deposits (historical to Pleistocene)

Sonoma Volcanics

Tstp	Tuff of Petrified Forest (Pliocene)
Tsrc	Rhyolite of Calistoga (Pliocene)

— — — — — Contact between map units
Solid where accurately located,
dashed where approximately located;
short dash where inferred;
dotted where concealed;
queried where uncertain.

Geologic map adapted from: Delattre, M.P. & Gutierrez, C.I., 2013. Preliminary Geologic Map of the Calistoga 7.5' Quadrangle, Napa and Sonoma Counties, California: A Digital Database. Scale 1:24,000. California Geological Survey website: <https://www.conservation.ca.gov/cgs/rgm/preliminary>

Onsite Wells

- Project Well
- Non-Project Well
- ✕ Destroyed Well

Known and Possible Offsite Wells

- Known or Possible Offsite Well
- Possible Offsite Well - Possibly Destroyed
- ▲ Possible Offsite Well - Capped
- ✕ Possible Offsite Dry Well

Subject Parcel (Napa County, 2024b)

Significant Streams (PBES & LSCE, 2023a)

Cross Section Alignment (see Figure 5)

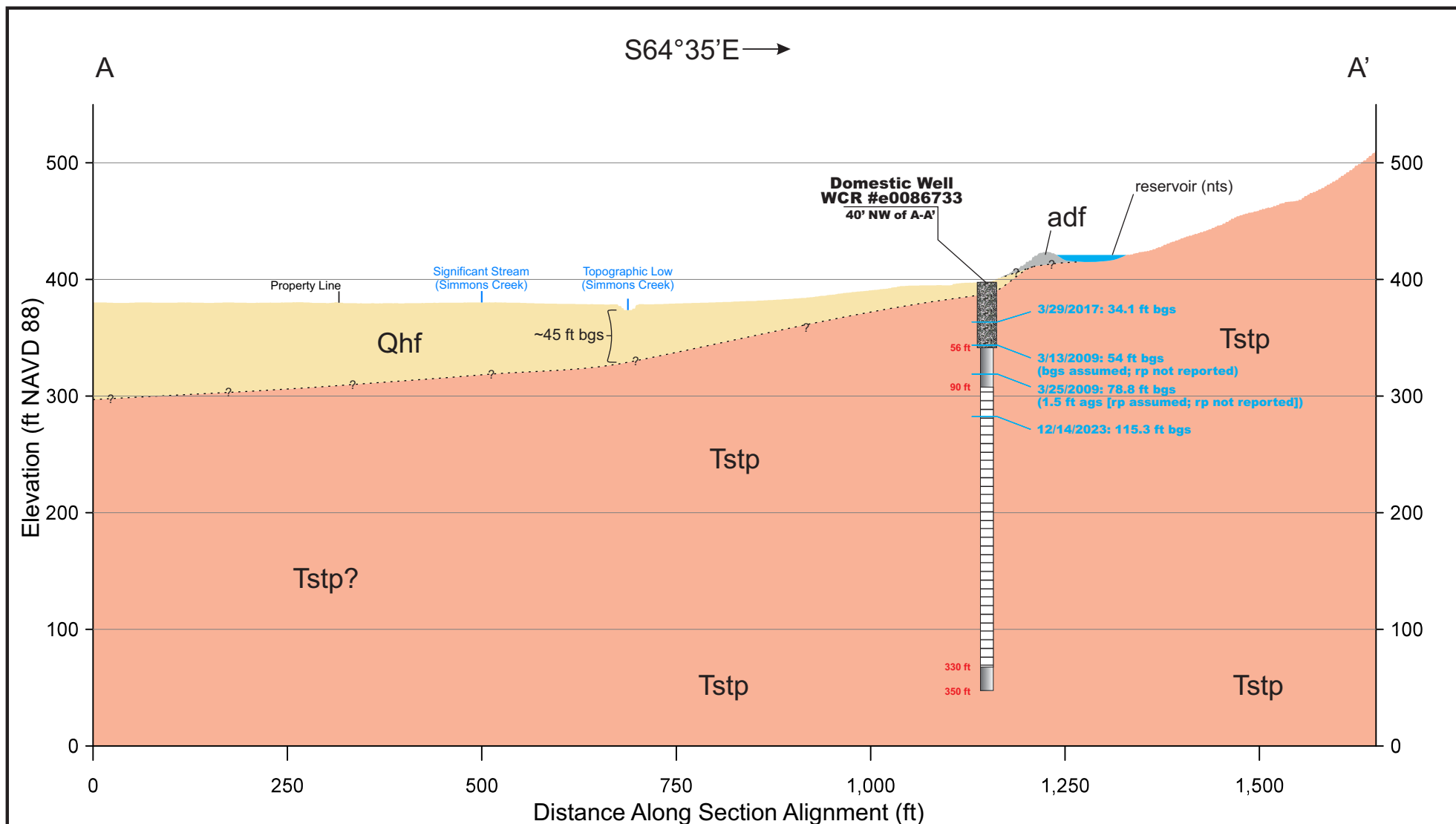


Figure 3 Geologic Map

Note: All locations shown are approximate.

RCS Job No. 642-NPA02

May 2024



ft = feet
 af = artificial fill
 nts = not to scale
 rp = reference point
 bgs = below ground surface ags = above ground surface WCR = State Well Completion Report

1.5x Vertical Exaggeration
 Horizontal alignment of Section shown on Figure 3
 Cross section based on Delattre & Gutierrez (2013)
 Elevation profile derived from USGS DEM (2020b)

ft = Well Construction Depth Below Ground Surface in Feet
 (as Reported on WCR for Completed Wells)

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

= Sanitary Seal = Perforated Casing
 = Blank Casing

Qhf Alluvial fan deposits (Holocene)
Tstp Tuff of Petrified Forest (Pliocene)
adf Artificial Dam Fill (Historical)
 - - ? - - Inferred, Uncertain Geologic Contact



Figure 5
Cross Section A-A'

Job No. 642-NPA02

May 2024



MEMORANDUM

APPENDIX

State Well Completion Report
&
County Drilling Permit
for Domestic Well,

County Driller's Log & Drilling Permit
for Syrah Well

&

Well Inspection Reports by Ray's Well Testing Service Inc.
for Domestic Well and Syrah Well

Environmental

Cover Sheet

APN	020 - 348 - 030 - 000
Permit #	E09-00070
Program	Well
DocType	WL
Street #	2155
Street Name	Pickett Rd
Year	2009



ORIGINAL
File with DWR

Page 1 of 1

Owner's Well No. 1-2009

Date Work Began 3/2/2009, Ended 3/13/2009

Local Permit Agency Napa County Environmental Mgmt

Permit No. E09-00070

Permit Date 2/26/2009

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

No. **e0086733**

20-340-030

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

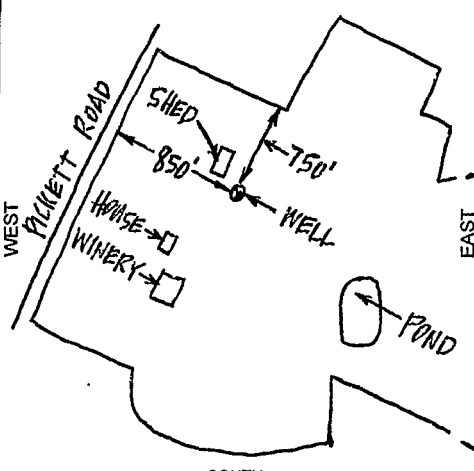
GEOLOGIC LOG

WELL OWNER

ORIENTATION (✓)		✓ VERTICAL	_____ HORIZONTAL	_____ ANGLE	_____ (SPECIFY)
DEPTH FROM SURFACE		DRILLING METHOD ROTARY		FLUID BENTONITE	
Fl. to Fl.		DESCRIPTION <i>Describe material, grain, size, color, etc.</i>			
0	10	TAN ASH WITH EMBEDDED ROCK			
10	40	HARD TAN VOLCANICS WITH ASH			
40	55	TAN VOLCANICS			
55	170	GRAY, GREEN VOLCANICS			
170	245	GRAY, GREEN VOLCANICS WISH ASH			
245	255	GRAY, GREEN VOLCANICS			
255	264	FRACTURED GRAY, GREEN VOLCANICS			
264	290	GRAY, GREEN VOLCANICS WITH ASH			
290	305	BLUE VOLCANIC ASH			
305	350	GRAY, GREEN VOLCANICS WITH BLUE ASH			
350	360	BLUE ASH WITH ROCK STRINGERS			
		CONTINUED CASING LAYOUT			
280	300	BLANK PVC 8"			
300	330	SCREEN PVC 8" .032 SLOT			
330	350	BLANK PVC 8"			
		</			

Name **Huckfeldt**
Mailing Address **2155 Pickett Road**
City **Calistoga** STATE **CA** ZIP **94595**

WELL LOCATION
Address **2155 Pickett Road**
City **Calistoga CA**
County **Napa**
APN Book **020** Page **340** Parcel **030**
Township _____ Range _____ Section _____
Latitude _____

LOCATION SKETCH NORTH  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 & COMPLETE.		ACTIVITY (✓) ☒ NEW WELL ☐ MODIFICATION/REPAIR ___ Deepen ___ Other (Specify) _____ ☐ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG") PLANNED 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 **95** (Ft.) BELOW SURFACE **1**
DEPTH OF STATIC WATER LEVEL **54** (Ft.) & DATE MEASURED **3/13/2009**
ESTIMATED YIELD **300** (GPM) & TEST TYPE **AIR LIFT**
TEST LENGTH **3** (Hrs.) TOTAL DRAWDOWN **N/A** (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				
Fl.	to	Fl.	BLANK	SCREEN	CON- DUCTOR	FILL PIPE									Fl.	to	Fl.
0	60	15									0	56	✓				SAND
60	360	12									56	350				✓	#6 SAND
0	90		✓				PVC F480	8	SDR-21								
90	180			✓			PVC F480	8	SDR-21	.032							
180	200		✓				PVC F480	8	SDR-21								
200	280			✓			PVC F480	8	SDR-21	.032							

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 **HUCKFELDT WELL DRILLING, INC.**
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

2110 Penny Lane

ADDRESS

Napa

CITY

CA

STATE

94559

ZIP

Signed

Don Huckfeldt
WELL DRILLER/AUTHORIZED REPRESENTATIVE

03/20/09

DATE SIGNED

439-746

C-57 LICENSE NUMBER

Environmental

Cover Sheet

APN	020 - 340 - 030 - 000
Permit #	E09-00074
Program	Well
DocType	pmt
Street #	2155
Street Name	Pickett Rd
Year	2009





A Tradition of Stewardship

Environmental Management

1195 Third Street, Suite 101
Napa, CA 94559
www.co.napa.ca.us

Main: (707) 253-4471
Fax: (707) 253-4545

Steven Lederer
Director

WELL PERMIT

Application Type: EM Permits-Water Wells-Class I

Permit Number: E09-00070

Applied Date: 02/26/2009

Parcel Number: 020-340-030-000

Issued Date: 02/26/2009

Permit Expires On: 2/26/2011

Situs Address: 2155 PICKETT ROAD CALISTOGA

Owner: ARAUJO JAMES B TR

Phone:

Address: 2155 PICKETT ROAD, CALISTOGA, CA, 94515-1804

Applicant: DON HUCKFELDT

Phone:

Business Name: HUCKFELD WELL DRILLING

Project Type: EM Permits-Water Wells-Class I

Proposed Use:

Use: Private

Name of Public Water System:

Well To Service This Parcel Only?: Yes

Water Supply:

All Setbacks Required By Code?:

Hazmat Site Within 1500 feet?: Yes

Ground Water Permit Required?: No

Hazmat Site Number and Name:

Emergency Exemption Granted?:

Well Located in Flood Zone?: No

Reason For Emergency Exemption:

Specifications:

Casing Diameter (inches): 6 8

Method of Seal Placement: pump

Boring Diameter (inches): 12 1/2

Material: concrete

Annular Seal (inches): 3

Minimum Seal Depth (feet): 50-58

TO PERMITEE:

Any work performed or operations conducted under the auspices of this permit constitutes acceptance of all conditions, inspections and comments contained in the this permit, and the incorporation of all requirements as set forth in the permit application.

Staff Signature: _____

Date: 2/26/09



A Tradition of Stewardship

Environmental Management

1195 Third Street, Suite 101
Napa, CA 94559
www.co.napa.ca.us

Main: (707) 253-4471
Fax: (707) 253-4545

Steven Lederer
Director

CONDITIONS/INSPECTIONS/COMMENTS

Application Type: Class I

Permit Number: E09-00070

Applied Date: 02/26/2009

Parcel Number: 020-340-030-000

Issued Date: 02/26/2009

Owner: ARAUJO JAMES B TR

Applicant: DON HUCKFELDT

Conditions:

<u>Description</u>	<u>Comment</u>
EM-11	The applicant shall comply with the Department of Public Works "Conditions of Approval-National Pollution Discharge Elimination System Requirements", a copy of which was provided at the time of permit issuance. Failure to comply with the NPDES requirements will result in a stop-work order.
EM-2	A copy of the State of California Well Completion Report must be submitted within 60 days of well completion. ✓ JP 6/8/09

Inspections:

Inspected By:

Date:

Description

Construction Inspection

Environmental Management Final

JP 7 3/12/09
JP 6/2/09

Comments:

<u>Date</u>	<u>Comment</u>
02/26/2009	Haz Mat reviewed by JK. OK with 50 foot seal Call 253-4135 at least 24 hours in advance during normal business hours to schedule inspection requests. Inspections are taken on a first-come-first-served basis so if you need a specific date and time be sure to call well in advance Environmental Management's inspection must be obtained prior to covering any portion of the system.
02/26/2009	Any deviation from these permit specifications without prior approval from the Department of Environmental Management will be cause for stopping work until the changes are fully justified and approved. Well permits are issued only to licensed well drillers. A copy of the well driller's license (C-57) must be on file with DEM. If a claim is to be submitted for a refund, per County Code, a 25% processing fee will be retained. Such claims must be made within one year of the date on the receipt.



A Tradition of Stewardship
A Commitment to Service

Environmental Management

1195 Third Street, Suite 101
Napa, CA 94559
www.co.napa.ca.us

Main: (707) 253-4471
Fax: (707) 253-4545

Steven Lederer
Director

APPLICATION
THIS IS NOT A PERMIT

Application Type: EM Permits-Water Wells-Class I

Permit Number: E09-00070

Parcel Number: 020-340-030-000

Situs Address: 2155 PICKETT ROAD CALISTOGA

Applied Date: 02/26/2009

Owner: ARAUJO JAMES B TR

Phone:

Applicant: DON HUCKFELDT

Phone:

Worker's Compensation Coverage:

- () A Certificate of current Worker's Comp Insurance Coverage is on file with this office (or 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 of California.

I, the undersigned, hereby assume fully all risks associated with providing incorrect information as to the location of the septic systems. I acknowledge that the County of Napa will issue a well permit in reliance upon information contained in this application and, on behalf of myself, heirs, administrators and or assigns, I hereby fully release the County, its elected officials, officers and employees from any and all claims and liability whether actual or potential, known or unknown, that may arise in connection with the information provided in the application.

Owner or Authorized Agent Signature: _____

[Handwritten Signature]

Date: _____

2/26/09

WELL CONSTRUCTION APPLICATION

PROPERTY OWNER INFORMATION

WELL DRILLER INFORMATION

Name: James & Daphne Araujo Trust Company Name: Huckfeldt Well Drilling
Address: 2155 Pickett Road Calistoga Contact person: Don
APN: 020-340-030 Address: 2110 Penny Lane Napa
Phone #: 942-6061 Phone #: 255-7923

TYPE OF PERMIT (circle one): Class 1A Class 1B Class II Deepening
Reconstruction Other: _____

PROPOSED USE (circle one): Private Public

Well to serve this parcel only: Y N Well Located in MST Groundwater Basin: Y N
If no, list other APN(s): _____ Well Located in Floodplain: Y N

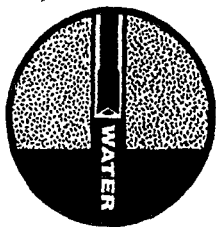
SETBACKS TO WELL:

Sewer Line: _____ feet
Septic Tank: 500' +/- feet
Disposal Field: _____ feet

WELL SPECIFICATIONS:

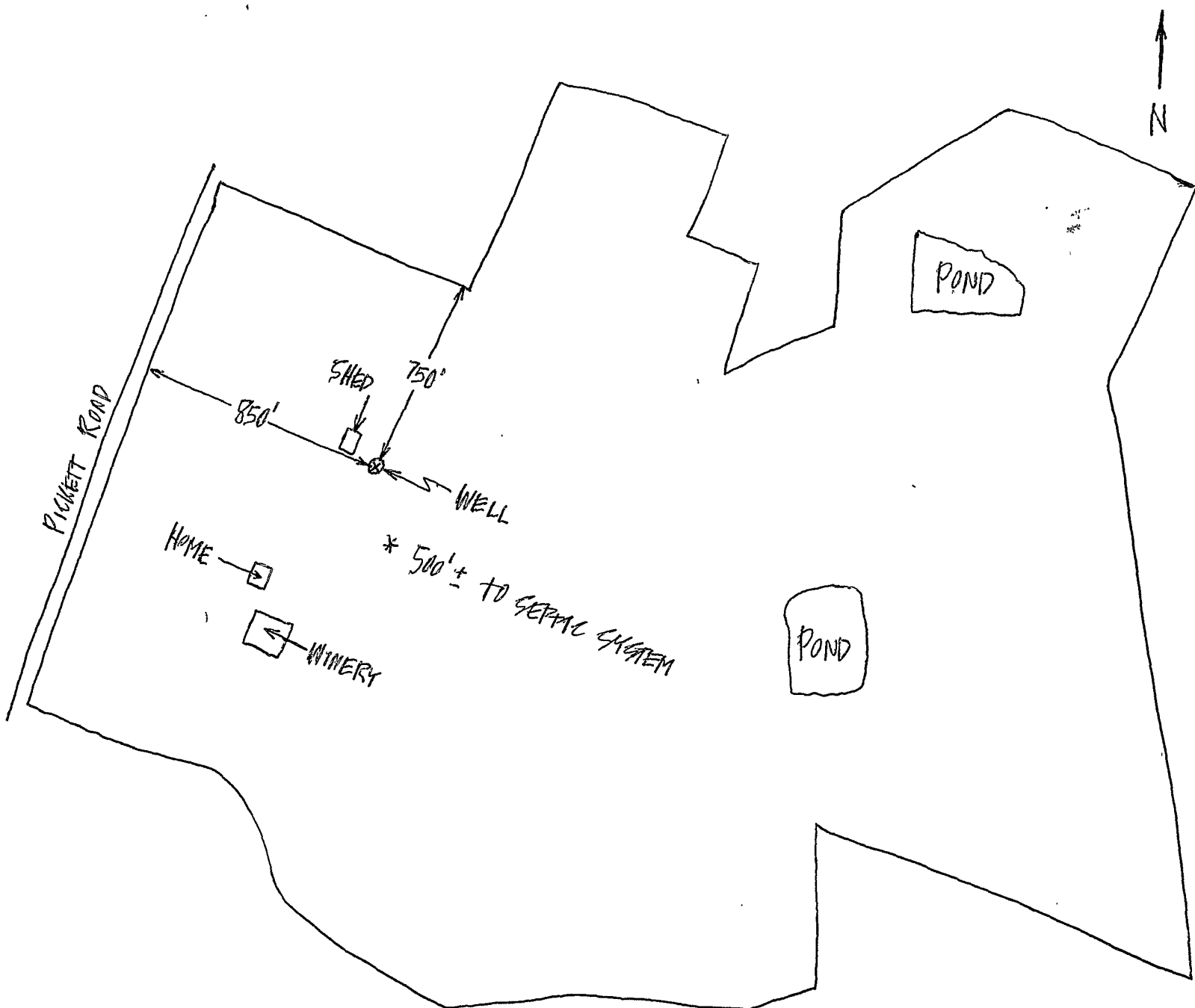
Casing Diameter: 6 inches Sealing Material: concrete
Boring Diameter: 12 inches
Annular Seal: 3 inches Sealing Method: pump
Minimum Seal Depth: 50 feet

A MAP OF THE WELL LOCATION SHALL BE ATTACHED TO THIS APPLICATION.
THE MAP SHALL INCLUDE THE DISTANCE FROM THE WELL TO PROPERTY LINES,
SEWAGE DISPOSAL SYSTEMS, STRUCTURES, ETC AND SHALL INCLUDE ALL
OTHER PERTINENT INFORMATION SPECIFIC TO THIS WELL.



HUCKFELDT WELL DRILLING

ARAUJO ESTATE
2155 PICKETT ROAD
CALISTOGA, CA 94515
AP# 020-340-030



Geographic Information Systems

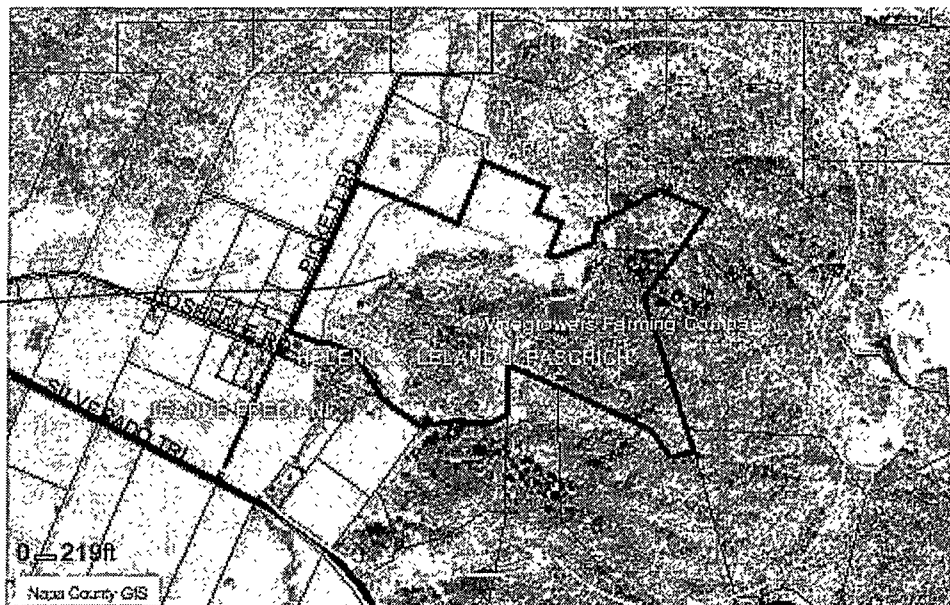
COUNTY HOME LIVING IN NAPA DOING BUSINESS VISITING NAPA GOVERNANCE

Menu

- GIS Home
- GIS Data
- User Group
- News & Info
- Training
- Resources
- Reports
- Mapping Applications

proposed
well
80' SEAL

Parcel: 020340030000 2155 PICKETT RD CST



New Search
Disclaimer

Select tool and click location on map to activate.

☒ Zoom In ☐ Zoom Out ☐ Pan ☐ Identify

Pl
H
Lege

3 HazMat Release(s) Inside 1500 Foot Buffer

Case Number	Job Number	Site Name	Category	Status
NAPA0479	22-00479	FREDIANI FARM	AgUST	unknown ✓
NAPA0488	22-00488	HELEN L. & LELAND J. PASCHICH	AgUST	unknown ✓
NAPA0391	22-00391	Winegrowers Farming Company	Hazfac	closed ✓

Notes:

A list of related documents can be displayed by clicking on the Job Number. Once the document list is displayed in the new window, double-click the document name to display it.

This list does not include all available documents. It only includes those cases that have been closed and scanned. Open cases will not be listed. All files can be reviewed during normal business hours at the office the Napa County Department of Environmental Management at 1195 Third Street, Room 101 in Napa, CA Call (707) 253-4471 to arrange to review files.

If you have disabled pop-up windows, you may not be able to view the document list.

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Environmental

Cover Sheet

APN	020 - 340 - 030 - 000
Permit #	
Program	Well
DocType	W/L
Street #	2155
Street Name	Pickett Rd
Year	1986



**POOR
QUALITY
ORIGINAL (S)**

46 DATE 10/6/86
RECEIPT NO. 15253 BY

NAPA COUNTY HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTH

A.P. NO. 020-340-12

31.43 ac

APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME (Owner) ADDRESS (Job Location)
NAME Pulliam Drilling ADDRESS 2877 Piedmont DATE 10-6-86
(Well Driller)

TYPE OF WORK NEW WELL RECONDITIONING DEEPENING
TYPE I PERMIT DESTROY OTHER
TYPE II PERMIT TEST HOLE

PROPOSED USE DOMESTIC IRRIGATION INDUSTRIAL MUNICIPAL
TEST WELL OTHER HOT WATER

Sewage Disposal on site (existing or proposed) Public Individual Private
Distance from well to any part of nearest sewage disposal system 400 feet.
(Sketch of site to accompany application) County road setback 48 feet from centerline.

TYPE OF EQUIPMENT TO BE USED: Rotary 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.

Signature of Applicant

10-6-86
Date

CASING

CONSTRUCTION:

Total Depth 320 Ft. Depth of Casing 320

Surface Seal to 24 Ft.

Any Stratas Sealed: Yes No

If yes, depth of stratas:

From Ft. to Ft./From Ft. to Ft.

Perforations:

From 160 Ft. to 324 Ft./From Ft. to Ft.

From Ft. to Ft.

WATER LEVELS

First Water at 205 Ft. Static level at 170 Ft.

WELL TESTS

How performed Air Test

Yield 50 GPM with 110 Ft. Drawdown after 4

Hrs. Annular space depth 24 Ft./Thickness 2"

in. Diameter of casing 5 Material Plastic

Gravel Pack: Yes No Conductor Casing:

Yes No Sealed with: Concrete

Grout Neat Cement Pudd. Clay

Other Chlorination by: Owner

Pump Co. Driller

WELL LOG

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

Ft.	to	Ft.
0 To 29		Brown ash
29 To 60		Gray shale
60 To 205		Green ash = clay
205 To 250		Green ash and Blk rock
250 To 320		Gray shale

RECEIVED
JAN 6 1987
DIVISION OF
ENVIRONMENTAL HEALTH

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.

2-30
Office

Pink-Owner

Return to Office

Orange-Contractor

Contractor's Signature

Environmental

Cover Sheet

APN	020 - 340 - 000
Permit #	
Program	Well
DocType	PMT
Street #	2121
Street Name	Pickett Rd
Year	1986



EE 40⁰⁰ DATE 10/6/86
RECEIPT NO 18253 BY JW

Rec# 306
TW

NAPA COUNTY HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTH

A.P. NO. 020-340-12
31.43 ac.

APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME Helen L Paschich (Owner) ADDRESS 3121 Pickett Rd. Calistoga (Job Location)
NAME Pulliam Drilling (Well Driller) ADDRESS 2877 Piedmont DATE 10-6-86

TYPE OF WORK
NEW WELL ☒ RECONDITIONING ☐ DEEPENING ☐
TYPE I PERMIT ☒ DESTROY ☐ OTHER ☐
TYPE II PERMIT ☐ TEST HOLE ☐

PROPOSED USE
DOMESTIC ☐ IRRIGATION ☒ INDUSTRIAL ☐ MUNICIPAL ☐
TEST WELL ☐ OTHER ☐ HOT WATER ☐

Sewage Disposal on site (existing or proposed) Public ☐ Individual ☒ Private ☐
Distance from well to any part of nearest sewage disposal system 400' feet.
(Sketch of site to accompany application) County road setback 48' feet from centerline.

TYPE OF EQUIPMENT TO BE USED: Rotary ☒ 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.

Lem Pulliam
Signature of Applicant

10-6-86
Date

FOR OFFICE USE ONLY

	Date	By	Remarks
Pre-Inspection			
Class II Approval			
Permit Issued	10/6/86	<u>[Signature]</u>	
Const. Inspection	10/7/86	<u>[Signature]</u>	SEAL TO 25'
Final Inspection			
Final Approval			

Remarks: _____

BILL PULLIAM

Lic. No. 248677

WELL DRILLING

2877 PIEDMONT AVE.—NAPA, CALIF. 94558

(707) 224-9396

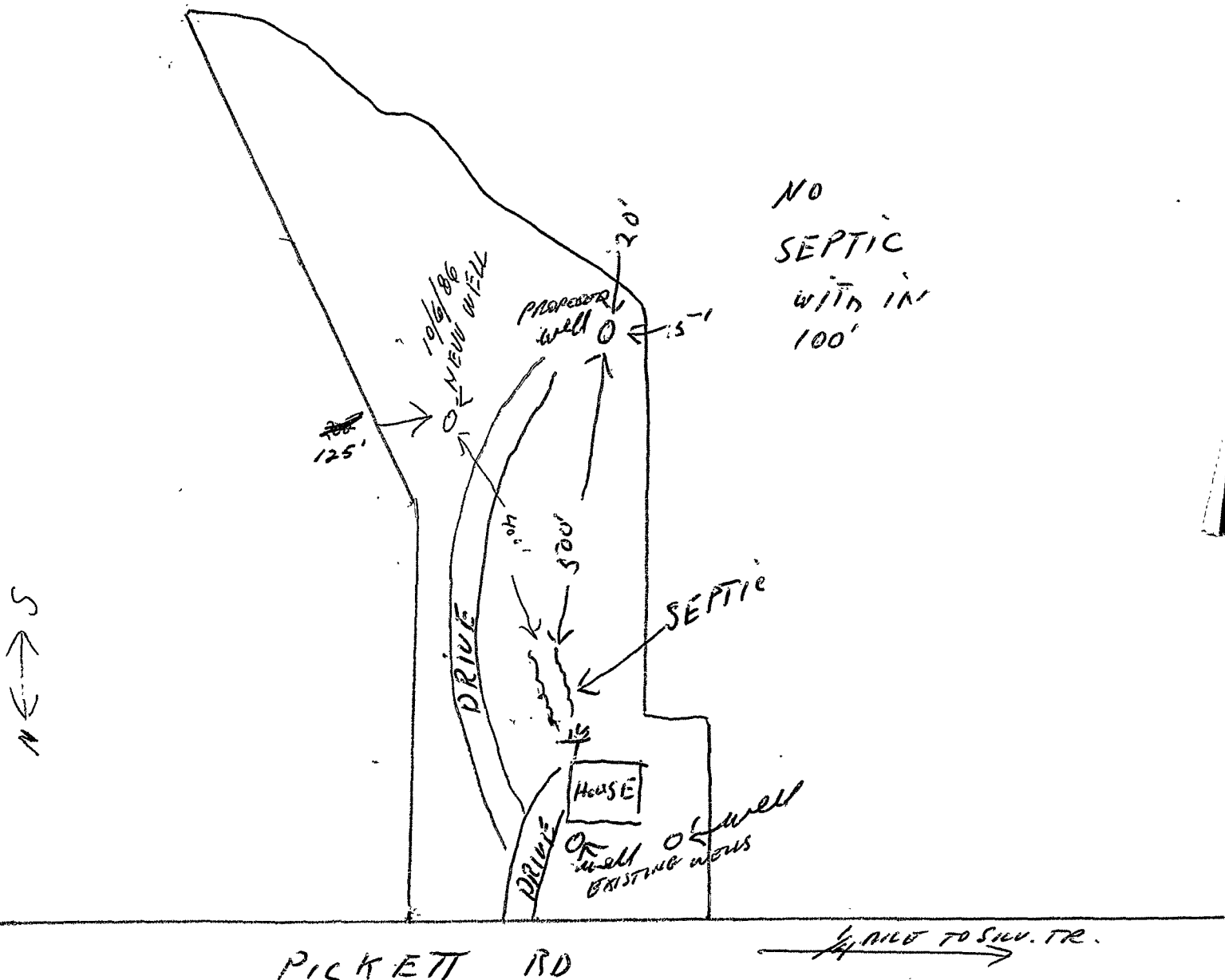
Paschich

LEE PASCHICH

2121 PICKETT RD

CALISTOGA

PARCEL — 20-340-12





Phone: 707 823 3191 **Fax:** 707 317 0057 **Email:** rayswelltesting@gmail.com **Lic#:** 903708

Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 08/18/21

Report #: 12969-1

Report By: Matt Owens

Subject Property Address: 2155 Pickett Rd, Calistoga CA 94515

Customer Name: Helene Mingot – Eisel Vineyards

WELL DATA:

Location/Description of well:	Vineyard Well - Near barn and wine cave
Type of Well:	Drilled
Depth of Well:	337 Feet – Per installer records
Diameter of Well Casing:	8" PVC
Sanitary Seal (plate seal at top of well):	Yes
Annular Well Seal (in ground seal of bore hole):	Unknown – Please refer to well log

PUMP DATA:

Pump HP and Type:	7.5 HP 230V 3PH Submersible, Grundfos 85S75-6
Depth of Pump Suction:	210 Feet – As indicated by installer records
Size of Tee at Well Head:	3 Inch
Submersible Cable Size:	#8-4
Water Level Control:	40A Yaskawa P1000 Variable Speed Controller
Backpressure Test:	11.2 GPM @ 310' TDH, 58.2 hz, 16.4 amps

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

Length of Test:	4 Hours		
Type of Test:	Constant Pumping Level		
Static Water Level:	210 Feet	Starting Flow	55 GPM
Water Level Drawdown:	0 Feet		
Final Pumping Level:	210 Feet	Final Flow	55 GPM

*note that static level is not resting water level as well was found pumping upon arrival.

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
08/18/21	09:50 AM	0 Minutes	210	Clear	No	No	55
08/18/21	10:05 AM	15 Minutes	210	Clear	No	No	55
08/18/21	10:20 AM	15 Minutes	210	Clear	No	No	55
08/18/21	10:35 AM	15 Minutes	210	Clear	No	No	55
08/18/21	10:50 AM	15 Minutes	210	Clear	No	No	55
08/18/21	11:05 AM	15 Minutes	210	Clear	No	No	55
08/18/21	11:20 AM	15 Minutes	210	Clear	No	No	55
08/18/21	11:35 AM	15 Minutes	210	Clear	No	No	55
08/18/21	11:50 AM	15 Minutes	210	Clear	No	No	55
08/18/21	12:05 PM	15 Minutes	210	Clear	No	No	55
08/18/21	12:20 PM	15 Minutes	210	Clear	No	No	55
08/18/21	12:35 PM	15 Minutes	210	Clear	No	No	55
08/18/21	12:50 PM	15 Minutes	210	Clear	No	No	55
08/18/21	01:05 PM	15 Minutes	210	Clear	No	No	55
08/18/21	01:20 PM	15 Minutes	210	Clear	No	No	55
08/18/21	01:35 PM	15 Minutes	210	Clear	No	No	55
08/18/21	01:50 PM	15 Minutes	210	Clear	No	No	55

Final Pumping Level: 210 Feet
Final Flow Rate: 55 GPM

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

DISCLAIMER:

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



Phone: 707 823 3191 **Fax:** 707 317 0057 **Email:** rayswelltesting@gmail.com **Lic#:** 903708

Address: 4853 Vine Hill Rd, Sebastopol Ca 95472

Date: 08/18/21

Report #: 12969-2

Report By: Matt Owens

Subject Property Address: 2155 Pickett Rd, Calistoga CA 94515

Customer Name: Helene Mingot – Eisel Vineyards

WELL DATA:

Location/Description of well:	Syrah Well – On ridge top near small pond at south side of property
Type of Well:	Drilled
Depth of Well:	318 Feet – As indicated by installer records
Diameter of Well Casing:	6" Steel with 5" PVC liner, installer records indicate well was deepened
Sanitary Seal (plate seal at top of well):	Yes
Annular Well Seal (in ground seal of bore hole):	Unknown – Please refer to well log

PUMP DATA:

Pump HP and Type:	3 HP 230V 1PH Submersible, 25 GPM Goulds
Depth of Pump Suction:	250 Feet – Per installer records
Size of Tee at Well Head:	2 Inch
Submersible Cable Size:	#10-4
Water Level Control:	Pumpsaver 233, 50 minute delay timer
Backpressure Test:	13.8 GPM @ 50 PSI @ 244', 12.3 amps

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

Length of Test:	4 Hours		
Type of Test:	Constant Pumping Level		
Static Water Level:	244 Feet	Starting Flow	14.7 GPM
Water Level Drawdown:	0 Feet		
Final Pumping Level:	244 Feet	Final Flow	14.7 GPM

WELL PRODUCTION DATA & PUMPING LOG:

Date	Time	Interval	Water Level	Appearance	Sulfur Odor	Sand	GPM
08/18/21	10:15 AM	0 Minutes	244	Clear	No	No	14.7
08/18/21	10:30 AM	15 Minutes	244	Yellow Tint	No	No	14.7
08/18/21	10:45 AM	15 Minutes	244	Yellow Tint	No	No	14.7
08/18/21	11:00 AM	15 Minutes	244	Orange	No	No	14.7
08/18/21	11:15 AM	15 Minutes	244	Orange	No	No	14.7
08/18/21	11:30 AM	15 Minutes	244	Orange	No	No	14.7
08/18/21	11:45 AM	15 Minutes	244	Orange	No	No	14.7
08/18/21	12:00 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	12:15 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	12:30 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	12:45 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	01:00 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	01:15 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	01:30 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	01:45 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	02:00 PM	15 Minutes	244	Orange	No	No	14.7
08/18/21	02:15 PM	15 Minutes	244	Orange	No	No	14.7

Final Pumping Level: 244 Feet
Final Flow Rate: 14.7 GPM

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

DISCLAIMER:

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

RECOMMENDATIONS:

1. The pressure tank inlet is plugged causing the pump to short cycle. Recommend repair.
2. The electrical backboard and liquid tight fittings are fire damaged. Recommend repair to prevent a hazard.

**Domestic Well
Groundwater Production**

Year	Gallons	Acre-Feet
2012	no data	
2013	no data	
2014	2,184,570	6.70
2015	660,000	2.03
2016	569,550	1.75
2017	999,750	3.07
2018	3,509,590	10.77
2019	1,726,480	5.30
2020	2,600,400	7.98
2021	7,802,980	23.95
2022	metering issues	
2023	metering issues	
Average Annual Production from Domestic Well (2014-2021)		
	2,506,665	7.69

**Syrah Well
Groundwater Production**

Year	Gallons	Acre-Feet
2012	no data	
2013	no data	
2014	likely metering issues	
2015	13,500	0.04
2016	3,160	0.01
2017	1,170	0.00
2018	2,510	0.01
2019	4,950	0.02
2020	2,870	0.01
2021	2,452,850	7.53
2022	374,640	1.15
2023	8,440	0.03
Average Annual Production from Syrah Well (2015-2023)		
	318,232	0.98

**Overall Groundwater Production
(Domestic & Syrah Wells Only)**

Year	Gallons	Acre-Feet
2012	no data	
2013	no data	
2014	>2,184,570	>6.70
2015	673,500	2.07
2016	572,710	1.76
2017	1,000,920	3.07
2018	3,512,100	10.78
2019	1,731,430	5.32
2020	2,603,270	7.99
2021	10,255,830	31.48
2022	>374,640	>1.15
2023	>8,440	>0.03
Overall* Average Annual Production from Domestic & Syrah Wells (2014-2021)		
	2,824,897	8.67

*Overall annual average calculated as sum of annual averages from each well.

Winery

Year	Gallons	Acre-Feet
2012	273,000	0.84
2013	205,000	0.63
2014	186,700	0.57
2015	204,600	0.63
2016	232,400	0.71
2017	183,000	0.56
2018	200,100	0.61
2019	201,600	0.62
2020	135,200	0.41
2021	106,600	0.33
2022	166,700	0.51
2023	129,700	0.40
Average Annual Winery Use (2012-2023)		
	185,383	0.57

<- peak ->

<- peak ->

<- peak