



June 17, 2024

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SUBJECT: WATER AVAILABILITY ANALYSIS REPORT
4370 OLD SONOMA HIGHWAY
NAPA, CALIFORNIA
NAPA COUNTY APN 047-110-017
EBA Job No. 23-3367

Mrs. Smith,

EBA Engineering (EBA) is pleased to present this Water Availability Analysis (WAA) in connection with permitting services for the development of the site located at 4370 Old Sonoma Highway in Napa, California (herein referred to as the project site). The intent of this WAA is to provide required information to obtain a water use permit for the development of the site in conformance to the requirements of Napa County's WAA Guidance Document, adopted May 12, 2015 (Napa County, 2015).

This WAA concludes that site groundwater demands are less than the estimated volume of water available for groundwater recharge on the project site under average precipitation years. Further, the existing groundwater well at the project site, is located less than 500 feet to an existing nearby well(s) and located less than 1,500 to a nearby Significant Stream(s). As such, Tier 1, 2, and 3 analyses will be evaluated in conformance with the previously outlined Napa County permitting guidance documentation.

- Well Permit Standards – Applicable Tables available on the Napa County website on the Groundwater Sustainability page;
- *Draft GSA Response to the Governor's Emergency Executive Order*, prepared by Napa County, dated June 2, 2022; and
- *WAA Guidance Document*, prepared by Napa County, adopted May 12, 2015.

1.0 BACKGROUND INFORMATION

1.1 Project Description

The project site is located on Old Sonoma Highway approximately 4-miles southwest of the City of Napa in Napa County (Figure 1, Appendix A). The project site is further identified by Napa County Assessor's Parcel Number (APN) 047-110-017 and is 2.35-acres (AC) in size. Please refer to Appendix D of this report for a complete project site description and site plan illustration, provided in the March 2024 *Wastewater Feasibility Study* prepared by NorCal Civil Engineering, Inc. Ground elevations across the project site range from approximately 115 to 130 feet above mean sea level (MSL). The entire project site is mapped as Haire loam soil with a hydrologic soil group rating of D (NRCS, 2020).

There is one existing well on the project site. According to the Well Completion Report (WCR) (No. e0173012) for the on-site well, archived within the Napa County Electronic Document Retrieval database, the well is completed to a depth of 610 feet below ground surface (BGS), had a depth-to-water (DTW) of 191 feet BGS and had a yield of 30 gallons per minute (GPM) at the time of well completion. A copy of the WCR (No. e0173012) for the on-site well can be found in Appendix B. Please refer to Appendix D of this Report for the location of the existing on-site well provided in the March 2024 *Wastewater Feasibility Study* created by NorCal Civil Engineering, Inc.

1.2 Hydrogeologic Setting

The Coast Ranges geomorphic province encapsulates the greater north bay area with northwest-trending ridges and valleys that run subparallel to the San Andreas Fault Zone. Regional geology surrounding the project site has been mapped to generally consist of Quaternary aged stream channel deposits (Qhc), stream terrace deposits (Qht), alluvium (Qa, Qpa, and Qoa), colluvium (Qc), and landslide deposits (Qls) overlying the early Pleistocene to Pliocene Huichica Formation (Th), the late Miocene to Pliocene aged Sonoma Volcanics (Tsvm and Tsvt), and the early Cretaceous to late Jurassic aged Great Valley Sequence (KJgv) (California Geological Survey [CGS], 2004). In the immediate vicinity of the project site, the surface geology has been mapped to consist predominantly of alluvium. Mapped geology in the vicinity of the project site is consistent with the regional hydrogeology described in the *Napa Valley Subbasin Groundwater Sustainability Plan* (Napa County, 2022a). Please refer to the Geologic Map included herein as Figure 3 (Appendix A).

Well Completion Reports maintained by California Department of Water Resources (DWR) for nearby wells are consistent with mapped geology. Wells nearby the project site are reportedly completed in predominantly the Great Valley Sequence. Drillers described encountering predominantly clay, sand, gravel, sandstone, and shale from the ground surface to the maximum depths explored. Water bearing zones for wells completed in the Great Valley Sequence are not expected to contain significant amounts of groundwater (Napa County, 2022a). Reported well yields in nearby wells range from 4

to 40 GPM. Please refer to Figure 3 (Appendix A) for a map of the geology in the vicinity of the project site.

A mapped Significant Stream, Carneros Creek, is located approximately 435 feet to the west of the existing on-site well. Please refer to Figure 2 (Appendix A) for a map of the project site in relation to Carneros Creek.

1.3 Local Climate

Review of published data by the Parameter-Elevation Regressions on Independent Slopes Model (PRISM) Climate Group, indicates the 10-year (2012 – 2021) average annual rainfall in the vicinity of the project site as defined by correspondence with Napa County is 23.2 inches per year (Prism, 2023). EBA understands the 10-year rainfall is considered average as defined by correspondence with Napa County. The 10-year data were evaluated using the 4 km spatial resolution and the interpolate grid cell values function.

Mean annual potential evapotranspiration (ET_o) was estimated to be 43.9 inches per year based on reference ET_o tables provided in the California Irrigation Management Information System (CIMIS) Reference Evapotranspiration Website (CIMIS, 2023).

2.0 EXISTING AND PROPOSED ON-SITE GROUNDWATER DEMANDS

Water demand was estimated based on information provided by the Client, Napa County Alternative Sewage Treatment Systems (ASTS) Guidelines, and the *WAA Guidance Document*. Please refer to Appendix D of this Report for the water demand estimates provided in the March 2024 *Wastewater Feasibility Study* created by NorCal Civil Engineering, Inc. NorCal reported a daily water demand of 2,168 gallons per day (GPD) for the proposed project. In addition to the water demand estimates provided by Norcal, a landscape irrigation estimate of 242 GPD for the proposed project was provided by the Client. Therefore, the maximum daily water demand of approximately 2,410 GPD (2,168 GPD + 242 GPD) is equivalent to an annual groundwater use of approximately 2.70 AFY.

3.0 GROUNDWATER RECHARGE ANALYSES

3.1 Project Site Groundwater Recharge Methodology

EBA analyzed the project site groundwater budget by comparing estimated inflows and outflows from the aquifer complex. The volume available for recharge was estimated based on precipitation and septic return flows as the principal source of inflow while outflows were estimated based on run-off, evapotranspiration, canopy interception, and spring losses. While secondary sources of inflow (such as upgradient boundary flow), and secondary sources of outflow (such as downgradient boundary flow, and surface-water-groundwater interaction) potentially contribute to the groundwater budget, they are

assumed to be equal and resultant in no net gain or loss. Based on this approach, the following equation was used to calculate potential volume of water available for recharge:

$$\text{Volume of Water Available for Recharge} = (P + \text{SRF}) - (R + \text{ET}_a + E_{\text{Cl}} + S)$$

where “P” is equal to precipitation (in acre-feet per year [AFY]), “SRF” is equal to Septic Return Flows (in AFY), “R” is equal to run-off (in AFY), “ET_a” is equal to actual evapotranspiration (in AFY), “E_{Cl}” is equal to evaporative losses related to canopy interception (in AFY) and “S” is equal to spring flow (in AFY). The groundwater recharge analysis was performed during average precipitation years (10-year period from 2012 to 2021). Details regarding the calculation of each of these variables are presented below.

Precipitation (P)

The total volume of precipitation that falls within the area of the project site was calculated by multiplying the average annual precipitation rate (23.2 inches per year) by the sum of the area of the project site (2.35 AC). The total annual precipitation over this area corresponds to 4.54 AFY during average annual rainfall scenario.

Septic Return Flows (SRF)

Based on the lack of a local sanitary sewer system near the project site, wastewater associated with indoor use is currently and will be managed in the future via an on-site sewage disposal system consisting of a septic tank (solids collection) and leach field (liquid effluent). The leach field component is designed to promote percolation of the liquid effluent into the subgrade and allow for natural filtration and treatment of the effluent prior to reaching the underlying groundwater table.

An 80 percent recharge factor is used in recharge estimates in the Napa County Groundwater Sustainability Plan (GSP) Section 8 (Napa County, 2022b). NorCal Engineering provided a daily water demand estimate of 2,168 GPD, which is equivalent to an annual use of approximately 791,320 gallons per year (GPY) or 2.43 AFY, assuming a 365-day use frequency. The total annual septic return flow to groundwater for the proposed project, using an 80 percent recharge factor, is estimated to be 1.94 AFY.

Run-off (R)

The percentage of the total precipitation that results as outflow (i.e., run-off) was estimated by comparing the ground slopes within the project site to run-off coefficients (RCs) for various types of developed and natural settings (ODOT, 2014). In general, slope surfaces were separated by areas identified as “flat” (less than 2 percent), “rolling” (2 to 10 percent) and “hilly” (greater than 10 percent). In this regard, the relative percentages of slopes within the project site that align with these categories are approximately 0, 100, and 0 percent, respectively. These areas, in turn, were further separated by the types of settings. Table 1 on the following page provides a breakdown of the setting types and range of RCs used in the analysis:

TABLE 1 (PROJECT SITE) RUNOFF COEFFICIENTS AND AREAS		
<i>Land Type</i>	<i>Area (AC)</i>	<i>Runoff Coefficient (RC)</i>
Oak	0.25	0.15
Seasonal Grasses	1.124	0.22
Landscaping	0.107	0.11
Bioretention Zones	0.025	0.15
Roofs/Concrete Paths/Driveways	0.518	0.90
Gravel Driveway	0.325	0.85
TOTAL	2.35	-

Using the aforementioned variables, the annual run-off volume for each area was calculated by multiplying the respective areas by the annual precipitation volume, followed by multiplying the corresponding products by the applicable RC. Please note that the acreages summarized in Table 1 correspond to future land use of the project site parcel. The summation of all the area run-off volumes equates to the total annual run-off volume for the entire project site. The average annual run-off volume was calculated to be approximately 2.04 AFY during average precipitation years.

Actual Evapotranspiration (ET_a)

As previously noted in Subsection 1.3 (*Local Climate*), the mean annual potential evapotranspiration (ET_o) for the area is estimated to be 43.9 inches per year, which translates to a total ET_o volume of approximately 8.60 AFY within the area of the project site parcel. Actual Evapotranspiration (ET_a) in turn, was calculated using a Water Use Classification of Landscape Species (WUCOLS) site specific model as described in *A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California* (UC Cooperative Extension, 2000). The WUCOLS model estimates ET_a for the native vegetation and landscaping. A review of aerial photography was utilized to determine appropriate species factors (K_S) and density factors (K_D) as outlined in the WUCOLS Guidance Documentation. A microclimate factor (K_{MC}) of 1 was selected based upon review of available climate data. Resulting landscape coefficients (K_L) were then multiplied by respective unit areas to determine an estimated ET_a for these vegetation types within the project site parcel.

The total ET_a within the project site parcel was then calculated to represent approximately 0.79 AFY during average precipitation years.

Canopy Interception (EC)

Canopy interception corresponds to the fraction of rainfall that is intercepted by the canopy of trees and shrubs and subsequently lost to evaporation. This fraction was estimated using equations developed by Helvey and Patric (Helvey & Patric, 1965) that utilize gross rainfall, throughput (i.e., rainfall that reaches the ground through spaces in



the vegetative canopy and as drip from leaves, twigs, and stems), and stemflow (i.e., rainfall that is caught on the canopy and reaches the ground by running down stems) variables. The calculation excluded grassland, vineyard, surface water bodies, pavement, and roof areas as the fraction of canopy interception for these areas is assumed to be negligible or not applicable. All other areas within the project site covered by tree canopy (approximately 0.25 AC) were subjected to canopy interception losses. Canopy interception losses were calculated to be approximately 0.03 AFY during average precipitation years.

Springs

Published data regarding spring flow discharges in the area were not available. EBA did not identify any potential spring locations during our field reconnaissance.

Water Budget Results

Using each of the calculated values in the groundwater recharge equation and taking into consideration the septic return flows to groundwater, the corresponding estimated volume of water available for groundwater recharge on the project site is approximately 3.62 AFY during average precipitation years. Based on the estimated groundwater demand of 2.70 AFY, this total groundwater use equates to approximately 75 percent of the water available for recharge in the area of the project site during average precipitation years. Results from the project water budget analysis are summarized in Tables 2 below.

TABLE 2 RESULTS FROM PROJECT SITE RECHARGE CALCULATIONS AVERAGE RAINFALL YEAR		
<i>Description</i>	<i>Inflow/Outflow</i>	<i>Volume (AFY)</i>
Precipitation	Inflow	+4.54
Septic Return Flows	Inflow	+1.94
Run-off	Outflow	-2.04
Actual Evapotranspiration	Outflow	-0.79
Canopy Interception	Outflow	-0.03
Springs	Outflow	- 0.00
TOTALS	-	+3.62

AFY: Acre-Feet per year.

4.0 WELL INTERFERENCE

Tier 2, outlined in the *WAA Guidance document* and the *Well Permit Standards – Applicable Tables*, requires that a well interference evaluation be conducted for a new or

existing groundwater well, constructed less than 500 feet to a nearby well. The existing well (No. e0173012) on the project site is constructed less than 500 feet to a nearby well. Therefore, the following Tier 2 evaluation to assess the potential drawdown in the existing nearby well(s) is described below in the following sections.

4.1 Drawdown Characteristics

One on-site well exists on the project site. However, no data exists to conduct an empirical distance-drawdown analysis which would require a pumping test with observation well data.

The nearest well (No. 796960) to the existing on-site well (No. e0173012) is approximately 150 feet away and will be used for the Tier 2 analyses.

4.2 Daily Water Demand

In accordance with the estimates outlined in NorCal Civil Engineering, Inc.'s *Wastewater Feasibility Study* (Appendix D) and the landscape irrigation water demand estimate provided by the Client, the maximum daily water demand for the proposed project is 2,410 GPD.

4.3 Pumping Rate and Duration

As presented above, the daily water demand is approximately 2,410 GPD. Whereas the demand would likely occur intermittently throughout the day, the total volume was assumed to be pumped at one time as a conservative measure.

The pumping duration required to meet the maximum daily water demand was estimated based on the 30 GPM yield from the existing on-site groundwater well (No. e0173012), at the time of well completion. It should be noted that this 30 GPM yield estimate is consistent with the average corrected yield (21 GPM) from the WCRs of water supply wells located in close proximity to the project site. According to these WCRs, the majority of these wells appear to be completed in similar lithology as the existing on-site well.

At an average pumping rate of 30 GPM, approximately 80 minutes of pumping is required to reach the maximum daily water demand. Based on known drawdown and recharge characteristics of wells in the vicinity of the project site, it is likely that the existing well will be solely capable of providing water supply for the proposed project.

4.4 Aquifer Transmissivity

Determination of aquifer transmissivity was accomplished using available data from the WCRs of water supply wells screened in lithology (Alluvium, Huichica, and Great Valley Sequence) the existing on-site well is completed in. The average corrected yield (21 GPM) and average drawdown (166 feet) calculated from data recorded in the WCRs was

used in an empirical transmissivity equation published in the *Groundwater and Wells* (Driscoll, 1986). The method used to calculate transmissivity is presented below:

$$\frac{Q}{s} = \frac{T}{1500}$$

for an unconfined aquifer, where “Q” is discharge rate (GPM), “s” is feet of drawdown in the well, and “T” is transmissivity (gallons per day per foot [GPD/ft]). Please note that an 80 percent multiplier was applied to the yield data to account for well inefficiency (assumed). The corresponding results from the calculation indicated a transmissivity value of 190 GPD/ft (25 square feet per day [ft²/day]).

Based on the method used above, aquifer transmissivity estimated from water supply wells in the vicinity of the project site (screened in Great Valley Sequence) is approximately 190 GPD/ft.

4.5 Well Interference Characteristics

The evaluation of well interference was conducted utilizing a distance-drawdown analytical computer model. Given a discharge rate and estimates of aquifer characteristics, the analytical model predicts groundwater drawdown as a function of distance from a pumping well. For this study, the classic nonequilibrium equation of Theis (1935) and the modified nonequilibrium equation of Jacob (1946) were used as the basis of our analysis.

Aquifer characteristics for the model were based on WCR data and literature values. As discussed previously in *Section 4.4*, the aquifer transmissivity was calculated using available data from the WCRs and an empirical transmissivity equation. A range of aquifer storage coefficient values for the model were based on representative specific yield values (Sandstone: Great Valley formation [0.05 - 0.15] - Shale: Great Valley formation [0.005 - 0.05]) provided on Table F-2 in Appendix F of the Napa County *WAA document*.

The following input parameters were used in the analytical model:

- *Pumping Rate:* 30 GPM
- *Aquifer Transmissivity:* 190 GPD/ft
- *Aquifer Storage Coefficient:* Range: 0.005 to 0.15
- *Pumping Duration:* 80 minutes

EBA conducted the distance-drawdown analytical computer model utilizing the range provided above for aquifer storage coefficient and the aquifer transmissivity. Model results, using the aforementioned storage coefficient value of 0.005 from the Napa County WAA and a transmissivity value of 190 GPD/ft, provided the most conservative model. It should be noted that the most conservative model, given the assumptions noted above, provided the result that would induce the largest drawdown in the well farthest from the existing on-site well. Based on these aquifer characteristics and the pumping duration

(80 minutes) required to meet the project sites maximum daily water demand, the analytical computer model predicts approximately 10 feet of drawdown at a distance of 24 feet, with less than one foot of drawdown at 48 feet.

According to the *WAA Guidance document* any neighboring well(s) (≤ 6 -inch diameter casing) within 500 feet of a new or existing groundwater well, screened within the same aquifer as the new or existing well, must have an estimated drawdown of 10 feet or less. As predicted by the distance-drawdown model presented above, the existing well on the project site must be located greater than approximately 24 feet from any nearby groundwater well(s) to be in conformance with Napa County Guidelines (≤ 10 feet of drawdown). Thus, the existing on-site well is greater than the 24-foot distance to a nearby well and is therefore in conformance with Napa County Guidelines. Please note that the above calculations assume 95% recovery within the pumping well before beginning the next pumping cycle.

5.0 SURFACE WATER DEPLETION FROM GROUNDWATER PRODUCTION

Tier 3, outlined in the *WAA Guidance document* and the *Well Permit Standards – Applicability Tables*, requires that a groundwater/surface water interaction evaluation be conducted for new or existing wells, located within 1,500 feet of a mapped Significant Stream(s). As previously mentioned, a mapped Significant Stream, Carneros Creek, is located approximately 435 feet to the west of the existing on-site groundwater well.

According to the *WAA Guidance document*, “streamflow depletion will be calculated using industry standard methods appropriate to the aquifer under consideration; such methods include the Hantush Equation applicable for aquifers hydraulically connected with surface waters (Hantush, 1965).” EBA used the web-based United States Geological Survey (USGS) STRMDEPL08 tool, with the Hantush equation described therein, to characterize streamflow depletion from a nearby pumping well (USGS, 2022). Please refer to *Section 4.0* above for a description of the calculations for the model parameter values, storage coefficient and transmissivity.

The following assumed parameter values were input into the model:

- Distance between the existing on-site groundwater well and Carneros Creek (435 feet);
- Transmissivity value of 190 GPD/ft ($25 \text{ ft}^2/\text{day}$);
- Storage coefficient values ranging from 0.005 to 0.15;
- Streambed Leakage value of 100 feet;
- A pumping rate of 30 GPM per the existing on-site well; and
- A pumping duration of 1 day.

EBA utilized the same aquifer transmissivity ($25 \text{ ft}^2/\text{day}$) and aquifer storage coefficient (0.005) values in the streamflow depletion model that resulted in the most conservative

well interference model outlined in *Section 4.0*. The results of the streamflow depletion model for the existing on-site well indicate a stream depletion rate of approximately 0.0000 cubic foot per second. Given the lack of modeled streamflow depletion in Carneros Creek, it is EBA's opinion that pumping from the existing on-site well would not contribute to significant and unreasonable stream depletion in Carneros Creek. It should be noted that this model assumes direct connection between the aquifer and the streambed, which may not be the case at this location.

Please note that the elevation of the Carneros Creek, as measured perpendicular to the existing on-site well, is approximately 94 feet above MSL, based on publicly available elevation data. The elevation of the well head of the on-site well is approximately 120 feet above MSL, which is approximately 26 feet greater in elevation than Carneros Creek. According to the well log (No. e0173012) for the project site well, the reported DTW at the time of well completion was approximately 191 feet BGS. Therefore, the reported static water level in the well at the time of completion in March 2013 was at an elevation of approximately 71 feet below MSL, which suggests that surface water flow in the Carneros Creek is recharging groundwater as opposed to groundwater discharging into Carneros Creek. It should be noted that the existing wells (No. 796960 and 284930) located proximal to Carneros Creek exhibit similar groundwater elevations as those observed in the on-site well. With this being said, the location of the project site well suggests that hydraulic connectivity between the on-site well and the Carneros Creek is low, and the water that will be pumped from the existing on-site well is different than what is in Carneros Creek.

6.0 CONCLUSIONS

The results of the WAA have indicated that:

- According to the water recharge analyses conducted herein, the amount of water available for recharge over the project site area, during average precipitation years, was calculated to be 3.62 AFY. Based on the estimated groundwater demand of 2.70 AFY, this total groundwater use equates to approximately 75 percent of the water available for recharge in the area of the project site during average precipitation years.
- Based on the analysis and assumptions presented herein, it does not appear that pumping in the existing on-site well, will be able to substantially influence any existing neighboring wells. As predicted by the distance-drawdown model presented herein, the existing well on the project site must be located greater than approximately 24 feet from any nearby groundwater well(s) to be in conformance with Napa County Guidelines (≤ 10 feet of drawdown).
- With regards to the effects of groundwater pumping at the project site on flow of water in Carneros Creek, significant or measurable surface water depletion as a

result of on-site groundwater extraction is not expected from the existing on-site well.

Based on the results of this evaluation, it is EBA's professional opinion that the Tier 1, 2, and 3 analysis is in conformance with the requirements outlined in the Well Permit Standards – Applicable Tables and Napa County *WAA Guidance Document*.

7.0 LIMITATIONS

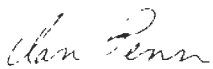
This report was prepared in accordance with generally accepted standards of professional hydrogeologic and engineering principles and practices at the place and time this study was performed. This warranty is in lieu of all other warranties, either expressed or implied. The conclusions presented herein are based solely on information made available to us by others, and includes professional interpretations based on limited research and data. Based on these circumstances, the decision to conduct additional investigative work to substantiate the findings and conclusions presented herein is the sole responsibility of the Client. No guarantee is made that groundwater of sufficient quantity or quality will be found in any specific depth or interval nor that pumping will not affect quality nor quantity of water found and/or subsidence. This report has been prepared solely for the Client and any reliance on this report by third parties shall be at such party's sole risk.

8.0 CLOSING

EBA appreciates the opportunity to be of service on this project. If you should have any questions regarding the information contained herein, please do not hesitate to contact our office at (707) 544-0784.

Sincerely,
EBA ENGINEERING

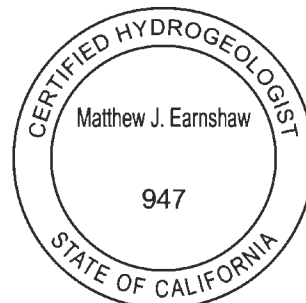
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- Appendices: Appendix A: Figures
Appendix B: On-Site Well – Water Well Completion Report
Appendix C: Off-Site Wells – Water Well Completion Reports
Appendix D: Existing and Proposed Water Use

9.0 REFERENCES

- California Department of Water Resources - Irrigation Training and Research Center, 2003. *California Crop and Soil Evapotranspiration for Water Balances and Irrigation Scheduling/Design*. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1154&context=bae_fac, data accessed June 2, 2024.
- California Irrigation Management Information System (CIMIS), *Reference Evapotranspiration*, Retrieved from <https://cimis.water.ca.gov/> on July 10, 2023.
- CGS, 2004. *Preliminary Geologic Map of the Napa 7.5' Quadrangle –Napa County, California: A Digital Database*. California Geological Survey – Clahan, K.B. et al.
- Driscoll, F.G., 1986. *Groundwater and Wells*, Johnson Division, St. Paul, Minnesota.
- Helvey, J.D. and Patric, J.H., 1965, *Canopy and Litter Interception of Rainfall by Hardwoods of Eastern United States*; Water Resources Research, Volume 1, Number 2, Second Quarter, p. 193-205.
- Jacob, C.E., 1946, *Drawdown Test to Determine Effective Radius of Artesian Well: Transactions*, Am. Soc. Civil Engineers, Vol. 112, p. 1047-1070.
- Napa County, 2015. *Water Availability Analysis (WAA) – Guidance Document*. Accessed June 2, 2024. <https://www.countyofnapa.org/3074/Groundwater-Sustainability>
- Napa County, 2022a. *Napa Valley Subbasin Groundwater Sustainability Plan, Section 4, Basin Setting - Napa County, CA*. January 2022. Accessed June 2, 2024. <https://www.countyofnapa.org/3218/GSP-Sections>
- Napa County, 2022b. *Napa Valley Subbasin Groundwater Sustainability Plan, Section 8, Water Budget - Napa County, CA*. January 2022. Accessed June 2, 2024. <https://www.countyofnapa.org/3218/GSP-Sections>
- Napa County, 2022c. *Draft Napa County and GSA Response to the Governor's Emergency Executive Order N-7-22*, Napa County Planning and Environmental Services Department, Napa County Groundwater Sustainability Agency. June 2, 2022.

Napa County, 2022d. *Well Permit Standards | Napa County, CA*. January 10, 2024. Accessed June 2, 2024. <https://www.countyofnapa.org/3074/Groundwater-Sustainability>

Natural Resources Conservation Service (NRCS), 2020, *Web Soil Survey*. <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>, data accessed June 2, 2024.

Oregon Department of Transportation, Highway Division, April 2014, *Hydraulics Design Manual, Appendix F*; Prepared by Engineering and Asset Management Unit, Geo-Environmental Section.

PRISM Climate Group, Oregon State University, <https://prism.oregonstate.edu/>, data accessed on May 19, 2023.

Theis, C.V., 1935, *The Relation between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Ground Water Storage*. Am. Geophysical Union, Washington, D.C. p. 518-524.

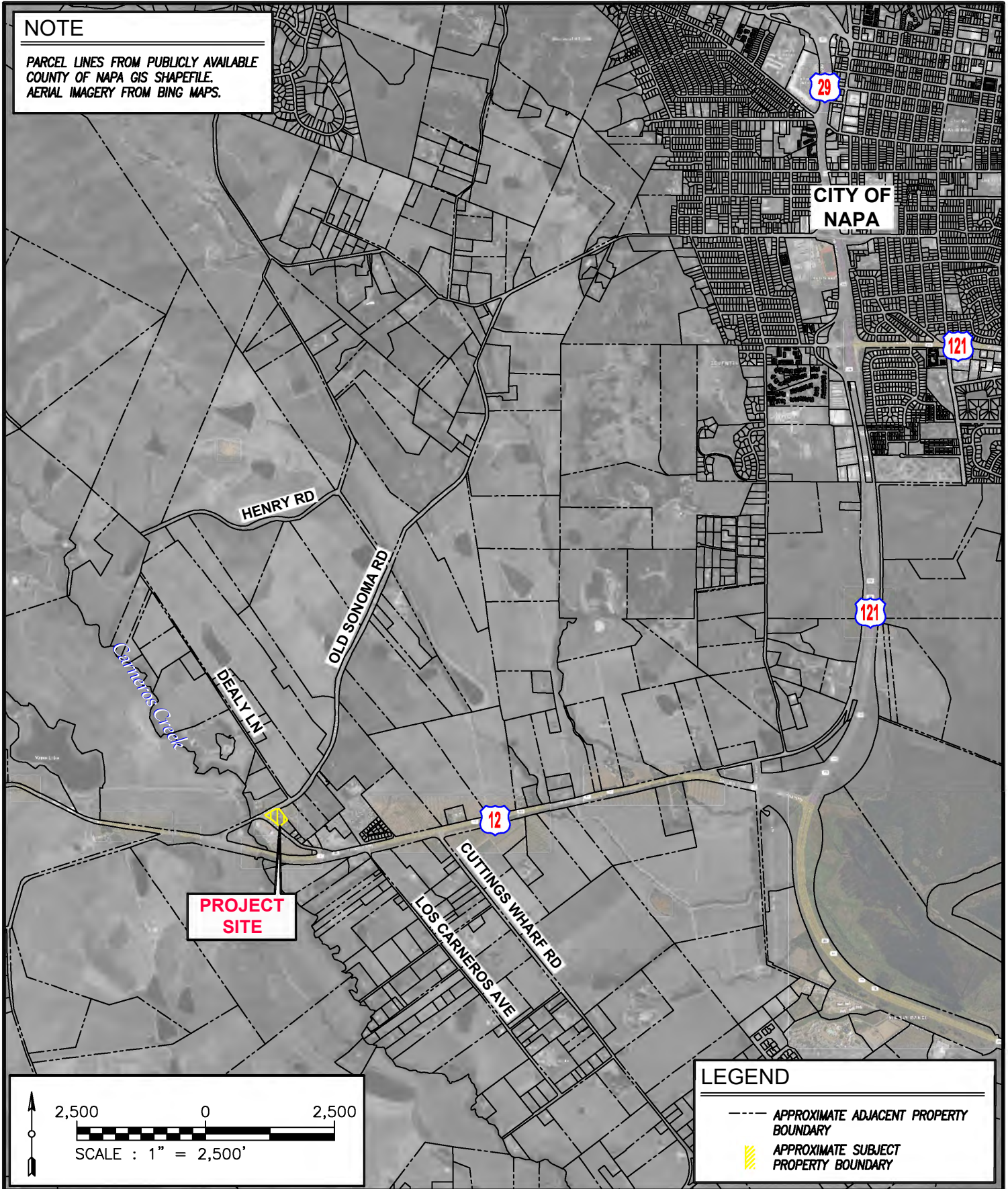
University of California Cooperative Extension - California Department of Water Resources, 2000. *A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California - The Landscape Coefficient Method and WUCOLS III*. <https://cimis.water.ca.gov/Content/PDF/wucols00.pdf> data accessed June 2, 2024.

United States Geological Survey, 2022, *STRMDEPL08-An Extended Version of STRMDEPL with Additional Analytical Solutions to Calculate Streamflow Depletion by Nearby Pumping Wells*. Accessed June 2, 2024. <https://mi.water.usgs.gov/software/groundwater/strmdepl08/>

APPENDIX A
FIGURES

NOTE

PARCEL LINES FROM PUBLICLY AVAILABLE
COUNTY OF NAPA GIS SHAPEFILE.
AERIAL IMAGERY FROM BING MAPS.



LOCATION MAP
4370 OLD SONOMA HWY
NAPA, CA 94559
APN: 047-110-017-000

FIGURE
1
23-3367

NOTE
 PARCEL LINES FROM PUBLICLY AVAILABLE COUNTY OF NAPA GIS SHAPEFILE. AERIAL IMAGERY FROM BING MAPS. STREAM/CREEK LINES OBTAINED FROM CALIFORNIA NATURAL RESOURCES AGENCY: CA STREAM V3 UPDATED: SEPTEMBER 16, 2022. CONTOURS DEVELOPED FROM PUBLICLY AVAILABLE NOAA OFFICE OF COASTAL MANAGEMENT. 2018-2019 USGS LIDAR: NORTHERN CALIFORNIA WILDFIRE - QL2. PROJECTION: STATE PLANE 1983, ZONE: ZONE 0402 CALIFORNIA 2, HORIZONTAL & VERTICAL DATUM: NAD83 UNITS: U.S. FEET.

- LEGEND**
- APPROXIMATE ADJACENT PROPERTY BOUNDARY
 - APPROXIMATE PROJECT SITE PROPERTY BOUNDARY
 - ON-SITE WELL
 - OFF-SITE WELL

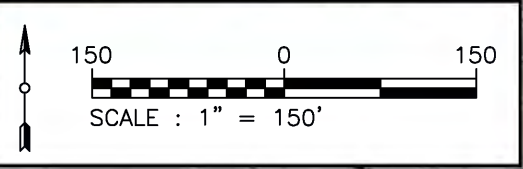
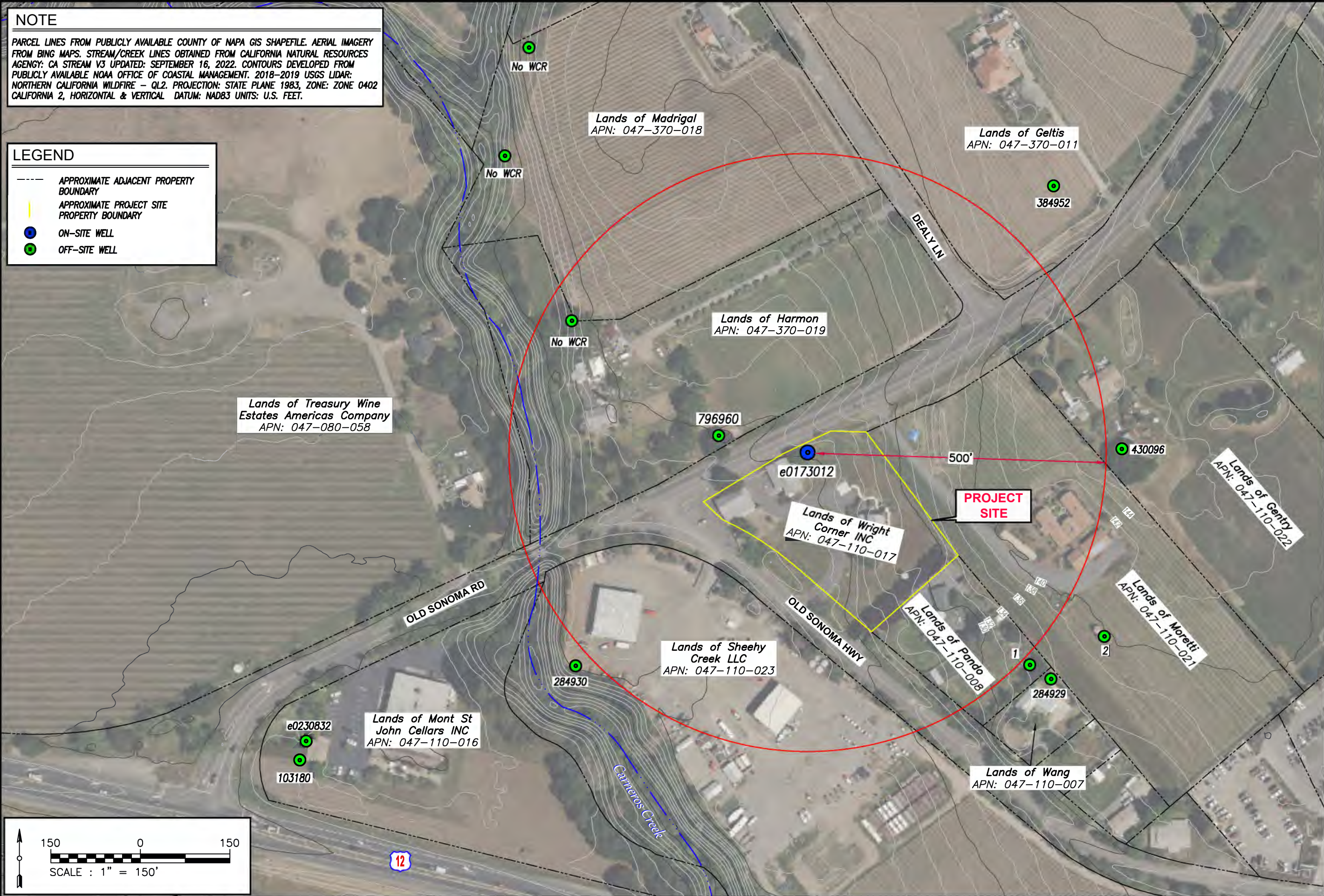


FIGURE
2
 23-3367

WELL INTERFERENCE MAP
 4370 OLD SONOMA HWY
 NAPA, CA 94559
 APN: 047-110-017-000

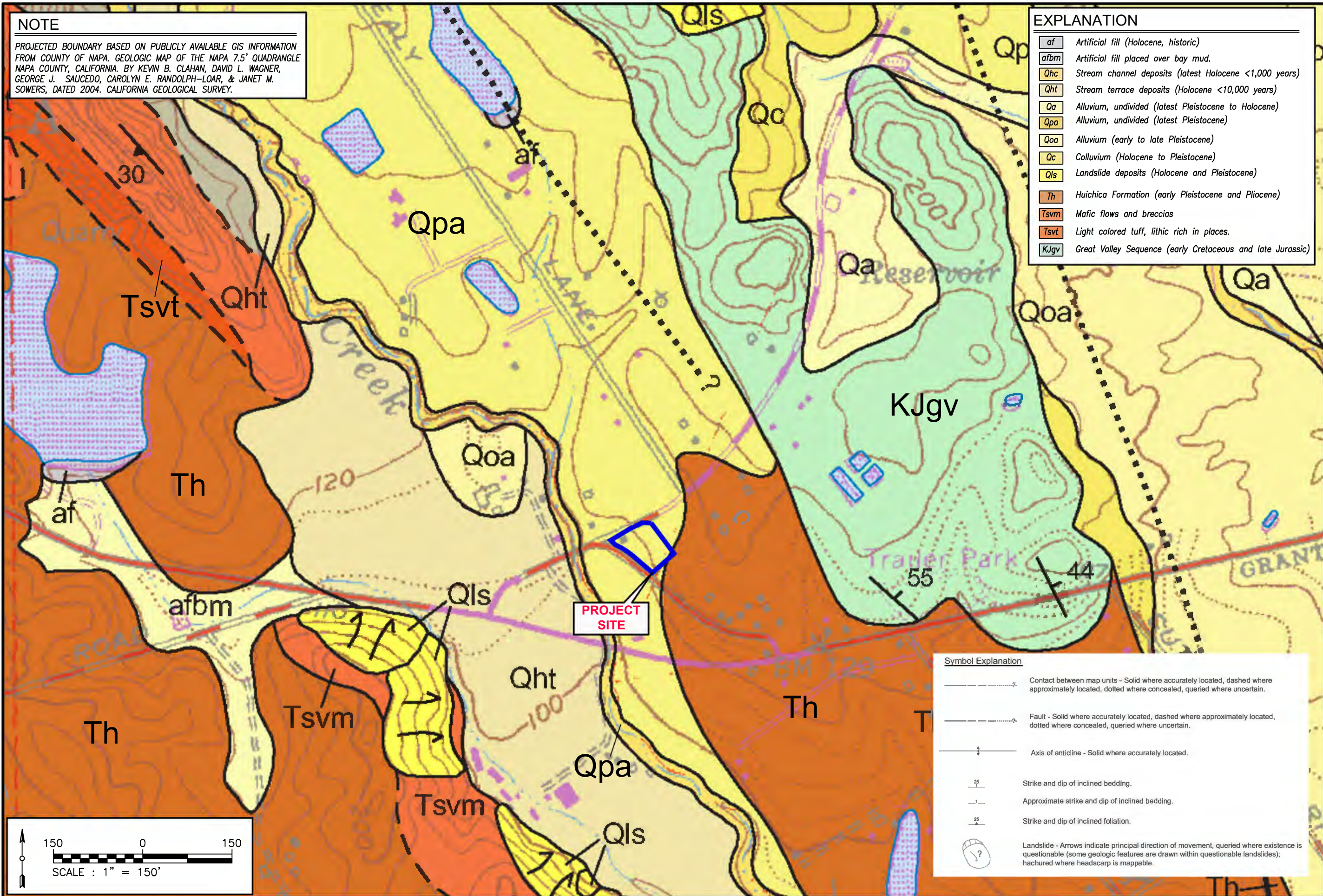
EBA
 ENGINEERING
 825 SONOMA AVENUE
 SUITE C
 SANTA ROSA, CA 95404
 TEL: (707) 544-0784

NOTE

PROJECTED BOUNDARY BASED ON PUBLICLY AVAILABLE GIS INFORMATION FROM COUNTY OF NAPA. GEOLOGIC MAP OF THE NAPA 7.5' QUADRANGLE NAPA COUNTY, CALIFORNIA. BY KEVIN B. CLAHAN, DAVID L. WAGNER, GEORGE J. SAUCEDO, CAROLYN E. RANDOLPH-LOAR, & JANET M. SOWERS, DATED 2004. CALIFORNIA GEOLOGICAL SURVEY.

EXPLANATION

af	Artificial fill (Holocene, historic)
afbm	Artificial fill placed over bay mud.
Qhc	Stream channel deposits (latest Holocene <1,000 years)
Qht	Stream terrace deposits (Holocene <10,000 years)
Qa	Alluvium, undivided (latest Pleistocene to Holocene)
Qpa	Alluvium, undivided (latest Pleistocene)
Qoa	Alluvium (early to late Pleistocene)
Qc	Colluvium (Holocene to Pleistocene)
Qls	Landslide deposits (Holocene and Pleistocene)
Th	Huichica Formation (early Pleistocene and Pliocene)
Tsvm	Mafic flows and breccias
Tsvt	Light colored tuff, lithic rich in places.
KJgv	Great Valley Sequence (early Cretaceous and late Jurassic)



PROJECT SITE

Symbol Explanation

	Contact between map units - Solid where accurately located, dashed where approximately located, dotted where concealed, queried where uncertain.
	Fault - Solid where accurately located, dashed where approximately located, dotted where concealed, queried where uncertain.
	Axis of anticline - Solid where accurately located.
	Strike and dip of inclined bedding.
	Approximate strike and dip of inclined bedding.
	Strike and dip of inclined foliation.
	Landslide - Arrows indicate principal direction of movement, queried where existence is questionable (some geologic features are drawn within questionable landslides); hachured where headscarp is mappable.

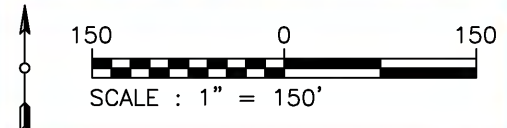


FIGURE
3
23-3367

GEOLOGIC MAP
4370 OLD SONOMA HWY
NAPA, CA 94559
APN: 047-110-017-000



APPENDIX B

ON-SITE WELL

WATER WELL COMPLETION REPORT

APPENDIX C
OFF-SITE WELLS
WATER WELL COMPLETION REPORTS

Well Log # 1

A.P. NO. 47-110-08

FEE 79⁰⁰ DATE 4/21/87
RECEIPT NO. 19535 BY *sw*

NAPA COUNTY HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTH

APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME *[Redacted]* ADDRESS *[Redacted]*
(Owner) (Job Location)

NAME *Bill Pulliam* ADDRESS _____ DATE *4-21-87*
(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 *100+* feet.
(Sketch of site to accompany application) County road setback *82* 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.

Bill Pulliam
Signature of Applicant

4-21-87
Date

CASING

CONSTRUCTION:
Total Depth *180* Ft. Depth of Casing *180*
Surface Seal to *22* Ft.
Any Stratas Sealed: Yes _____ No
If yes, depth of stratas: _____
From _____ Ft. to _____ Ft./From _____ Ft. to *Orange* Ft.
Perforations:
From *150* Ft. to _____ Ft./From *50* Ft. to *180* Ft.
From _____ Ft. to _____ Ft.

WELL LOG

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

Ft.	to	Ft.
0-5'		clay
5-10'		clay, gravel
10-30'		clay
30-50'		green clay
50-75'		green ash, gravel
75-85'		green clay
85-170'		green ash, streaks of broken up sandstone
170-180'		green clay

WATER LEVELS

First Water at *50* Ft. Static level at *30* Ft.

WELL TESTS

How performed *Bas*
Yield *20* GPM with *80* Ft. Drawdown after *2*
Hrs. Annular space depth *22* 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 _____

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.

RECEIVED
MAY 13 1987

Return to Office Pink-Owner
Return to Office Orange-Contractor *Bill Pulliam*
DIVISION OF ENVIRONMENTAL HEALTH
Contractor's Signature

47-110-023

047-110-023

8/1/89
#1679

well
w/c
Do not fill in

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

No. 284930

DUPLICATE
to comply with
requirements

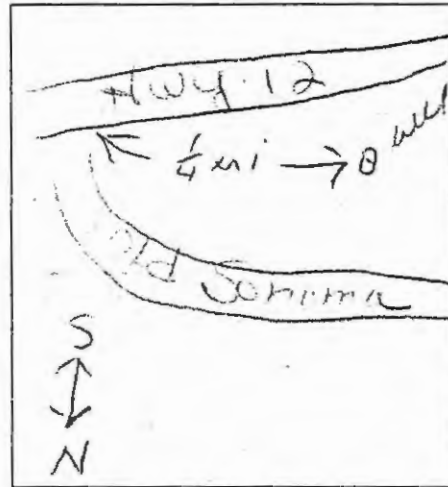
Notice of Intent No. _____
Local Permit No. or Date 23709

47-110-13

State Well No. _____
Other Well No. _____

(1) OWNER: Name _____
Address _____
City _____ ZIP _____
(2) LOCATION OF WELL (See instructions):
County napa Owner's Well Number _____
Well address if different from above _____
Township 47 Range 110 Section 13
Distance from cities, roads, railroads, fences, etc. _____

(12) WELL LOG: Total depth 410 ft. Completed depth 440 ft.
from ft. to ft. Formation (Describe by color, character, size or material)
0 - 27.5' yellow clay
27.5 - 320' broken up sand -
stone
220 - 400' clay streaks of
sand stone
430 - 440' clay



(3) TYPE OF WORK:
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe destruction materials and procedures in Item 12)

(4) PROPOSED USE:
Domestic
Irrigation
Industrial
Test Well
Municipal
Other (Describe)

(5) EQUIPMENT:
Rotary Reverse
Cable Air
Other Bucket

(6) GRAVEL PACK:
Yes No Size 20-4
Diameter of bore _____
Packed from 25 to 440 ft.

(7) CASING INSTALLED:

From ft.	To ft.	Dia. in.	Gage or Wall
0	440	5	160

(8) PERFORATIONS:

From ft.	To ft.	Slot size
90	440	5x3

(9) WELL SEAL:
Was surface sanitary seal provided? Yes No If yes, to depth 25 ft.
Were strata sealed against pollution? Yes No Interval _____ ft.
Method of sealing Cement

(10) WATER LEVELS:
Depth of first water, if known _____ ft.
Standing level after well completion 100 ft.

(11) WELL TESTS:
Was well test made? Yes No If yes, by whom? Driller
Type of test Pump Bailer Air lift
Depth to water at start of test 100 ft. At end of test 340 ft.
Discharge 40 gal/min after 4 hours Water temperature _____
Chemical analysis made? Yes No If yes, by whom? _____
Was electric log made? Yes No If yes, attach copy to this report

RECEIVED
AUG 1 1989
DEPT. OF ENVIRONMENTAL MANAGEMENT
Work started 3-31-89 Completed 4-12-89

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Signed Paul Pullen (Well Driller)
NAME Pullen Well Drilling
(Person, firm, or corporation) (Typed or printed)
Address 3877 Piedmont Ave
City Napa ZIP _____
License No. 148677 Date of this report 4-17-89

Well Log # 2

well WL

FEE 200 DATE 1/11/87

A.P. NO. 047-110-021

RECEIPT NO. 200 BY ew

NAPA COUNTY HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTH

APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME [Redacted] ADDRESS 5350 Old Song Road Napa
(Owner) (Job Location)

NAME Pulliam Drilling ADDRESS 2877 Piedmont DATE 9-3-87
(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 Y/N/A Private _____
Distance from well to any part of nearest sewage disposal system 300+ 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.

Bill Pulliam
Signature of Applicant

9-3-87
Date

CASING

CONSTRUCTION:
Total Depth 180 Ft. Depth of Casing 180
Surface Seal to 23 Ft.
Any Stratas Sealed: Yes _____ No
If yes, depth of stratas: 1 1/2 Ft. 1 1/2 Ft. 1 1/2 Ft.
Perforations:
From 60 Ft. to 180 Ft./From _____ Ft. to _____ Ft.
From _____ Ft. to _____ Ft.

WELL LOG

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

Ft.	to	Ft.
0-5'		clay
5-10'		clay & gravel
10-30'		clay
30-60'		green clay
60-90'		green clay & gravel
90-160'		green ash & streaks of broken up sandstone
160-180'		green clay

WATER LEVELS

First Water at 60 Ft. Static level at 570 Ft.

WELL TESTS

How performed Bail
Yield 15 GPM with 160 Ft. Drawdown after 2
Hrs. Annular space depth 23 Ft./Thickness 2 in.
Diameter of casing 5 1/2 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 _____

RECEIVED
JAN 15 1988

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.

40-30
100-Office Pink-Owner
10-Return to Office Orange-Contractor Bill Pulliam
Contractor's Signature

#3536

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

DWR USE ONLY - DO NOT FILL IN

STATE WELL NO./STATION NO. WL

LATITUDE _____ LONGITUDE _____

APN/TRS/OTHER _____

Page 1 of 1

Owner's Well No. 1

Date Work Began 8/1/91, Ended 8/6/91

Local Permit Agency Napa Co Environmental Health

Permit No. EH 029088 Permit Date 7/31/91

No. **430096**

GEOLOGIC LOG

WELL OWNER 047-110-022

ORIENTATION () VERTICAL HORIZONTAL ANGLE _____ (SPECIFY)

DEPTH TO FIRST WATER _____ (Ft.) BELOW SURFACE

DEPTH FROM SURFACE		DESCRIPTION <i>Describe material, grain size, color, etc.</i>
Ft.	to Ft.	
0	45	8" Casmg
45	50	Gravel
50	75	Clay
75	77	Sand & Gravel
77	140	Hard Clay
140	141	White Sand
141	160	Clay
160	162	Sand & Gravel
162	166	Hard Clay
166	200	Shale

Name [Redacted]

Mailing Address 5283 Old Sonoma Rd
Napa Ca 94558

CITY _____ STATE _____ ZIP _____

WELL LOCATION

Address 5283 Old Sonoma Rd

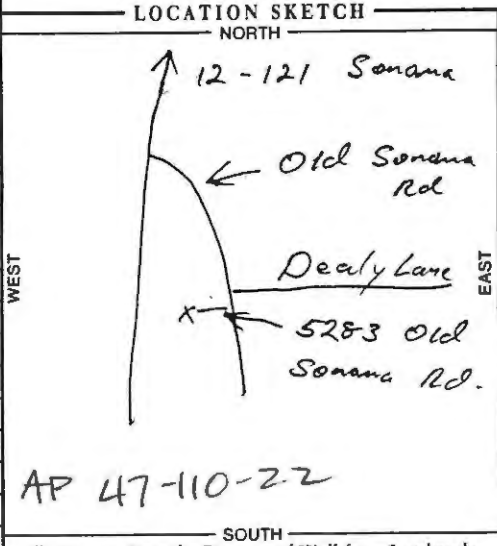
City Napa

County _____

APN Book 47 Page 110 Parcel 22

Township _____ Range _____ Section _____

Latitude _____ Longitude _____



ACTIVITY ()

NEW WELL

MODIFICATION/REPAIR

Deepen

Other (Specify) _____

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

PLANNED USE(S) ()

MONITORING

WATER SUPPLY

Domestic

Public

Irrigation

Industrial

"TEST WELL"

CATHODIC PROTECTION

OTHER (Specify) _____

RECEIVED

MAY 22 1992

DEPT. OF ENVIRONMENTAL MANAGEMENT

AP 47-110-22

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

DRILLING METHOD Rotary (FLUID)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH OF STATIC WATER LEVEL 50' (Ft.) & DATE MEASURED 8/20/91

ESTIMATED YIELD 4 (GPM) & TEST TYPE 2 Pump

TEST LENGTH 14 (Hrs.) TOTAL DRAWDOWN 160 (Ft.)

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

TOTAL DEPTH OF BORING 208 (Feet)

TOTAL DEPTH OF COMPLETED WELL 200 (Feet)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	CASING(S)					
		TYPE ()	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)	
0	40	8 3/4	PVC	5"	200		
40	200	8 3/4	PVC	5"	200	.020"	

DEPTH FROM SURFACE Ft. to Ft.	ANNULAR MATERIAL			
	CE-MENT ()	BEN-TONITE ()	FILL ()	FILTER PACK (TYPE/SIZE)
0	24			
24	200			3/8 Pea Gral

- ATTACHMENTS ()
- Geologic Log
 - Well Construction Diagram
 - Geophysical Log(s)
 - Soil / Water Chemical Analyses
 - Other _____
- ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

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

NAME D. Bess Pump & Well

ADDRESS 1115 Mt. George Ave CITY Napa STATE Ca ZIP 94558

Signed [Signature] DATE SIGNED 8/22/91 C-57 LICENSE NUMBER 487023

WELL DRILLER/AUTHORIZED REPRESENTATIVE

QUADRUPPLICATE
Use to comply with
local requirements

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

8/1/89
#1629

Do not fill in
No. 284929

47-110-07

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

State Well No. _____
Other Well No. _____

(1) OWNER: Name _____
Address _____
City _____ ZIP _____

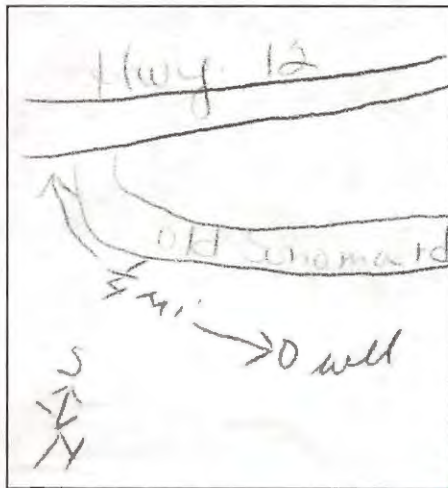
(2) LOCATION OF WELL (See instructions):
County _____ Owner's Well Number _____

Well address if different from above _____
Township _____ Range _____ Section _____

Distance from cities, roads, railroads, fences, etc. 24 mi. North
West of Hwy 12 on old
Seneca road

(12) WELL LOG: Total depth 180 ft. Completed depth 180 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

0 - 5' clay
5 - 9' gravel & boulders
9 - 60' clay
60 - 180' green clay, streaks
of sandstone



(3) TYPE OF WORK:
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe
destruction materials and pro-
cedures in Item 12)

(4) PROPOSED USE:
Domestic
Irrigation
Industrial
Test Well
Municipal
Other
(Describe)

WELL LOCATION SKETCH

(5) EQUIPMENT:
Rotary Reverse
Cable Air
Other Bucket

(6) GRAVEL PACK:
Yes No Size 2/4
Diameter of bore 9"
Packed from 25' to 180'

(7) CASING INSTALLED:
Steel Plastic Concrete

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	180	5	160	60	180	3x5

(9) WELL SEAL:
Was surface sanitary seal provided? Yes No If yes, to depth 25' ft.
Were strata sealed against pollution? Yes No Interval _____ ft.
Method of sealing Cement

(10) WATER LEVELS:
Depth of first water, if known 60 ft.
Standing level after well completion 40 ft.

(11) WELL TESTS:
Was well test made? Yes No If yes, by whom? Driller
Type of test Pump Bailer Air lift
Depth to water at start of test 40 ft. At end of test 100 ft.
Discharge 25 gal/min after 2 hours Water temperature _____
Chemical analysis made? Yes No If yes, by whom? _____
Was electric log made Yes No If yes, attach copy to this report

Work started 4-13-1989 Completed 4-17-1989

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Signed William Pulliam
NAME Pulliam Well Drilling
Address 3877 Piedmont Ave
City Napa ZIP _____
License No. 248677 Date of this report 4-18-89

44-370-011

#4390

QUADRUPPLICATE
Use to comply with
local requirements

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

Do not fill in

No. 384952

Notice of Intent No. _____
Local Permit No. or Date 32111

State Well No. _____
Other Well No. _____

(1) OWNER: Name Mr. [redacted]
Address 5267 Old Sonoma rd.
City Napa ZIP _____

(12) WELL LOG: Total depth 485 ft. Completed depth 485 ft.
from ft. to ft. Formation (Describe by color, character, size or material)

(2) LOCATION OF WELL (See instructions):
County 28 Owner's Well Number _____

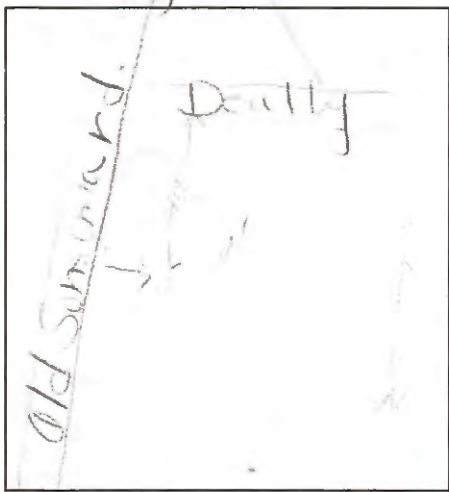
0 - 135 Clay

Well address if different from above _____
Township 41 Range 311 Section 11

135 - 310 green clay, streaks

Distance from cities, roads, railroads, fences, etc. Call map of old Sonoma rd and Dealy Lane

- of br. ker. up sand -
- stone



(3) TYPE OF WORK:
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe destruction materials and procedures in Item 12)

310 - 440' (red) clay
440 - 485' (red) clay, streaks

(4) PROPOSED USE:
Domestic
Irrigation
Industrial
Test Well
Municipal
Other (Describe)

WELL LOCATION SKETCH

(5) EQUIPMENT:
Rotary Reverse
Cable Air
Other Bucket

(6) GRAVEL PACK:
Yes No Size _____
Diameter of bore _____
Packed from _____ to _____ ft.

(7) CASING INSTALLED:
Steel Plastic Concrete

(8) PERFORATIONS:
Type of perforation or size of screen

From ft.	To ft.	Dia. in.	Gage or Wall	From ft.	To ft.	Slot size
0	485	4	204			

From ft.	To ft.	Slot size

(9) WELL SEAL:
Was surface sanitary seal provided? Yes No If yes, to depth 11 ft.
Were strata sealed against pollution? Yes No Interval _____ ft.
Method of sealing T

(10) WATER LEVELS:
Depth of first water, if known _____ ft.
Standing level after well completion 40 ft.

(11) WELL TESTS:
Was well test made? Yes No If yes, by whom? Drilled
Type of test Pump Bailer Air lift
Depth to water at start of test _____ ft. At end of test 260 ft.
Discharge 10 gal/min after _____ hours Water temperature _____
Chemical analysis made? Yes No If yes, by whom? _____
Was electric log made Yes No If yes, attach copy to this report

Work started 11-18-92 Completed 12-5-92

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Signed _____ (Well Driller)
NAME Tuller Well Drilling
Address 2871 Piedmont Ave
City Napa ZIP 94558
License No. 248611 Date of this report 12-15-92

NOT FOR PUBLIC USE
WATER CODE SEC. 13752

RECEIVED
JUN 21 1993
DEPT. OF ENVIRONMENTAL MANAGEMENT

File Original with DWR

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. **e0230832**

Page _____ of _____

Owner's Well Number _____

Date Work Began 08/26/2014 Date Work Ended 9/4/2014

Local Permit Agency Napa County

Permit Number E14-00673 Permit Date 8/21/14

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

Geologic Log		
Orientation <input checked="" type="radio"/> Vertical <input type="radio"/> Horizontal <input type="radio"/> Angle Specify _____		
Drilling Method <u>Direct Rotary</u> Drilling Fluid <u>Polymer mud</u>		
Depth from Surface		Description
Feet to Feet		Describe material, grain size, color, etc
0	60	Brown Clay
60	65	Sandy Gravel
65	185	Brown Clay
185	315	Hard Gray Rock
315	535	Gray & White Clay
Perforation Lay out		
P = Perforation		
B = Blank		
0 to 153 Blank		
P		
B		
P		
B		
P 253 ft		
B		
P		
P		
B		
P 353 ft		
Total Depth of Boring <u>535</u> Feet		
Total Depth of Completed Well <u>353</u> Feet		

RECEIVED
OCT 06 2014

Napa County Planning, Building & Environmental Services

Well Owner	
Name	<u>Madonna Estates</u>
Mailing Address	<u>5400 Old Sonoma Road</u>
City	<u>Napa</u> State <u>CA</u> Zip <u>94559</u>
Well Location	
Address	<u>5400 Old Sonoma Road</u>
City	<u>Napa</u> County <u>Napa</u>
Latitude	_____ N Longitude _____ W
Datum	_____ Dec. Lat. _____ Dec. Long. _____
APN Book	<u>047</u> Page <u>110</u> Parcel <u>016-000</u>
Township	_____ Range _____ Section _____

Location Sketch	
(Sketch must be drawn by hand after form is printed.)	
North	
South	
<small>Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.</small>	

Activity	
<input checked="" type="radio"/> New Well	
<input type="radio"/> Modification/Repair	
<input type="radio"/> Deepen	
<input type="radio"/> Other _____	
<input type="radio"/> Destroy	
<small>Describe procedures and materials under "GEOLOGIC LOG"</small>	
Planned Uses	
<input checked="" type="radio"/> Water Supply	
<input type="checkbox"/> Domestic <input type="checkbox"/> Public	
<input checked="" type="checkbox"/> Irrigation <input type="checkbox"/> Industrial	
<input type="radio"/> Cathodic Protection	
<input type="radio"/> Dewatering	
<input type="radio"/> Heat Exchange	
<input type="radio"/> Injection	
<input type="radio"/> Monitoring	
<input type="radio"/> Remediation	
<input type="radio"/> Sparging	
<input type="radio"/> Test Well	
<input type="radio"/> Vapor Extraction	
<input type="radio"/> Other _____	

Water Level and Yield of Completed Well	
Depth to first water	<u>140</u> (Feet below surface)
Depth to Static	
Water Level	<u>120</u> (Feet) Date Measured <u>09/04/2014</u>
Estimated Yield *	<u>20</u> (GPM) Test Type <u>Air Lift</u>
Test Length	<u>4.0</u> (Hours) Total Drawdown <u>200</u> (Feet)
*May not be representative of a well's long term yield.	

Casings							
Depth from Surface	Borehole Diameter	Type	Material	Wall Thickness	Outside Diameter	Screen Type	Slot Size if Any
Feet to Feet	(Inches)			(Inches)	(Inches)		(Inches)
0	58	11	Blank	PVC Sch. 40	R21	5	
58	153	8.5	Blank	PVC Sch. 40	R21	5	
153	353	8.5	Screen	PVC Sch. 40	R21	5	Milled Slots 0.032

Annular Material			
Depth from Surface	Fill	Description	
Feet to Feet			
0	58	Cement	cement / Vol Clay
58	535	Filter Pack	# 6 well pack

Attachments	
<input type="checkbox"/> Geologic Log	
<input type="checkbox"/> Well Construction Diagram	
<input type="checkbox"/> Geophysical Log(s)	
<input type="checkbox"/> Soil/Water Chemical Analyses	
<input type="checkbox"/> Other _____	
<small>Attach additional information, if it exists.</small>	

Certification Statement			
I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief			
Name <u>Pulliam Well Exploration Inc</u>			
<small>Person, Firm or Corporation</small>			
<u>4371 Cantelow Road,</u>	<u>Vacaville</u>	<u>CA</u>	<u>95688</u>
<small>Address</small>	<small>City</small>	<small>State</small>	<small>Zip</small>
Signed <u>[Signature]</u>	<u>9/7/2014</u>	<u>808-505</u>	
<small>C-57 Licensed Water Well Contractor</small>	<small>Date Signed</small>	<small>C-57 License Number</small>	

QUADRUPPLICATE
Use to comply with
local requirements

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

5-4-80
Do not fill in

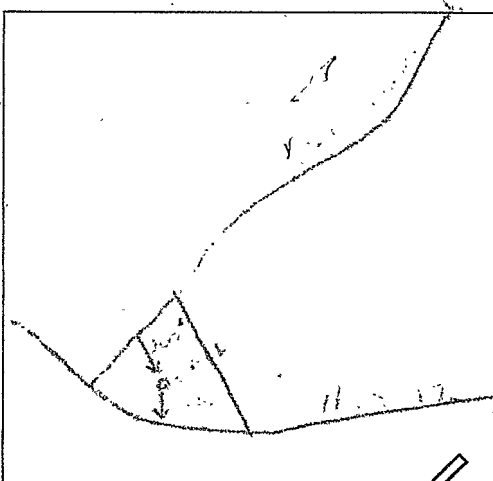
No. 103180

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

State Well No. _____
Other Well No. _____

(1) **OWNER:** Name _____
Address _____
City _____ Zip _____
(2) **LOCATION OF WELL** (See instructions):
County Napa Owner's Well Number 47-110-16
Well address if different from above Hwy 12 & Old Sonoma Rd
Township Napa Range _____ Section _____
Distance from cities, roads, railroads, fences, etc. _____

(12) **WELL LOG:** Total depth 150 ft. Depth of completed well 150 ft.
from ft. to ft. Formation (Describe by color, character, size or material)
0 - 3 Topsoil
3 - 14 Brown clay
14 - 31 Sandy brown clay
31 - 50 Blue clay
50 - 61 broken rock clay stringers
61 - 150 Brown clay



(3) **TYPE OF WORK:**
New Well Deepening
Reconstruction
Reconditioning
Horizontal Well
Destruction (Describe destruction materials and procedures in Item 12)
(4) **PROPOSED USE:**
Domestic
Irrigation
Industrial
Test Well
Stock
Municipal
Other

(5) **EQUIPMENT:**
Rotary Reverse
Cable Air
Other Bucket

(6) **GRAVEL PACK:**
Yes No Size 8 3/4
Diameter of bore _____
Packed from 0 to 21 ft.

(7) **CASING INSTALLED:**
Steel Plastic Concrete

From ft.	To ft.	Dia. in.	Cage or Wall
0	30	6	

(8) **PERFORATIONS:** machine
Type of perforation or size of screen

From ft.	To ft.	Slot size
30	150	1/8 x 3

(9) **WELL SEAL:**
Was surface sanitary seal provided? Yes No If yes, to depth 21 ft.
Were strata sealed against pollution? Yes No Interval _____ ft.
Method of sealing _____

(10) **WATER LEVELS:**
Depth of first water, if known 50 ft.
Standing level after well completion 8 ft.

(11) **WELL TESTS:**
Was well test made? Yes No If yes, by whom? Driller
Type of test Pump Bailor Air lift
Depth to water at start of test 50 ft. At end of test _____ ft.
Discharge 30 gal/min after _____ hours Water temperature _____
Chemical analysis made? Yes No If yes, by whom? _____
Was electric log made? Yes No If yes, attach copy to this report

Work started 5/22 1978 Completed 5/24 1978
WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
SIGNED [Signature]
(Well Driller)
NAME Doshier-Gregson Drilling Inc.
(Person, firm, or corporation) (Typed or printed)
Address 5365 Napa-Vallejo Hwy
City Vallejo Zip 94590
License No. 294001 Date of this report 5/25/78