Water Studies

WATER AVAILABILITY ANALYSIS

3646 SMR Vineyard Winery
3646 Spring Mountain Road
St. Helena, CA 94574
County of Napa, APN 022-150-026

Prepared for

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DRAFT

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Introduction

The objective of this study is to assess the availability of groundwater for a proposed 20,000 gallon per year winery to be located on the subject property in unincorporated Napa County northwest of St. Helena (Figure 1). This Water Availability Analysis (WAA) has been prepared using new guidelines adopted with approval of the Napa County Board of Supervisors May 12, 2015, for evaluating groundwater for discretionary projects requiring use permits such as new wineries. The guidelines were developed and disseminated by the Napa County Planning Building & Environmental Services Department (PBES).

The project site is located about four miles northwest of central St. Helena in the western hills of the Napa Valley. The 56.75 acre parcel is located at elevations ranging from 1,350 to 1,835 feet and the western edge of the parcel is approximately 0.4 miles from the ridgeline separating Napa and Sonoma counties. The parcel is located in the "Hillside" zone of the County with respect to the source of groundwater. Hillside parcels require a site-specific WAA to evaluate proposed project groundwater use in the context of local hydrogeologic conditions and in relation to estimated annual groundwater recharge.

The responsible professional for the WAA is Matt O'Connor, PhD, California Professional Geologist #6847 and Certified Engineering Geologist #2449, assisted by Jeremy Kobor, MS. O'Connor Environmental Inc. has conducted approximately 60 similar water availability analyses in bedrock aquifers of water-scarce zones of Sonoma County over the past 12 years, and has conducted a variety of hydrologic and geologic analyses in Napa and Lake County over the past 15 years.

Approach

The WAA procedure requires the applicant

> ...to estimate the average annual recharge occurring on the project parcels(s) and consider the amount of recharge relative to the estimation of project water use (e.g., all current and projected water demands for the property on which the planned project is located). The estimate of annual recharge can be made by various methods including water balance methods. The selected method should be based on data from the parcel or watershed where the proposed project is located. The estimated project water use, including existing and proposed uses of water on the project parcel(s), shall include estimates for normal and dry water years.[1]

[1] Water Availability Analysis (WAA), Adopted May 12, 2015 by Board of Supervisors, County of Napa, p. 8.

The analytical tool used to estimate groundwater recharge is the water balance, the most fundamental means available to hydrogeologists. The U.S. Geological Survey's Soil Water Balance (SWB) model was utilized to develop a site-specific water balance and results were compared to several existing regional water balance estimates in the area. Prior to conducting a water balance analysis, the contributing area of the local aquifer where recharge is expected to occur must be determined. This requires development of a conceptual model of the local aquifer based on available hydrogeologic data.

The location of wells on the project parcel and neighboring parcels that could be affected by project groundwater use must be located to evaluate potential well interference per Tier 2 criteria of the WAA.

Organization of this WAA

This report is organized as follows. The first section describes the proposed project including projected water use. The second section describes hydrogeologic conditions that define the probable groundwater recharge area in the vicinity of the project based on available maps and drillers' reports for wells on the project parcel. The third section presents the water balance analysis. The fourth section summarizes the Tier 1 WAA for the project. The fifth section addresses the Tier 2 component of the WAA.

Limitations

Groundwater systems of Napa County and the Coast Range are typically complex, and available data rarely allows for more than general assessment of groundwater conditions and delineation of aquifers. This analysis is based on limited available data and relies significantly on interpretation of data from disparate sources of disparate quality. Drillers' reports and water quality data available for this assessment were made available to us by the property owner.

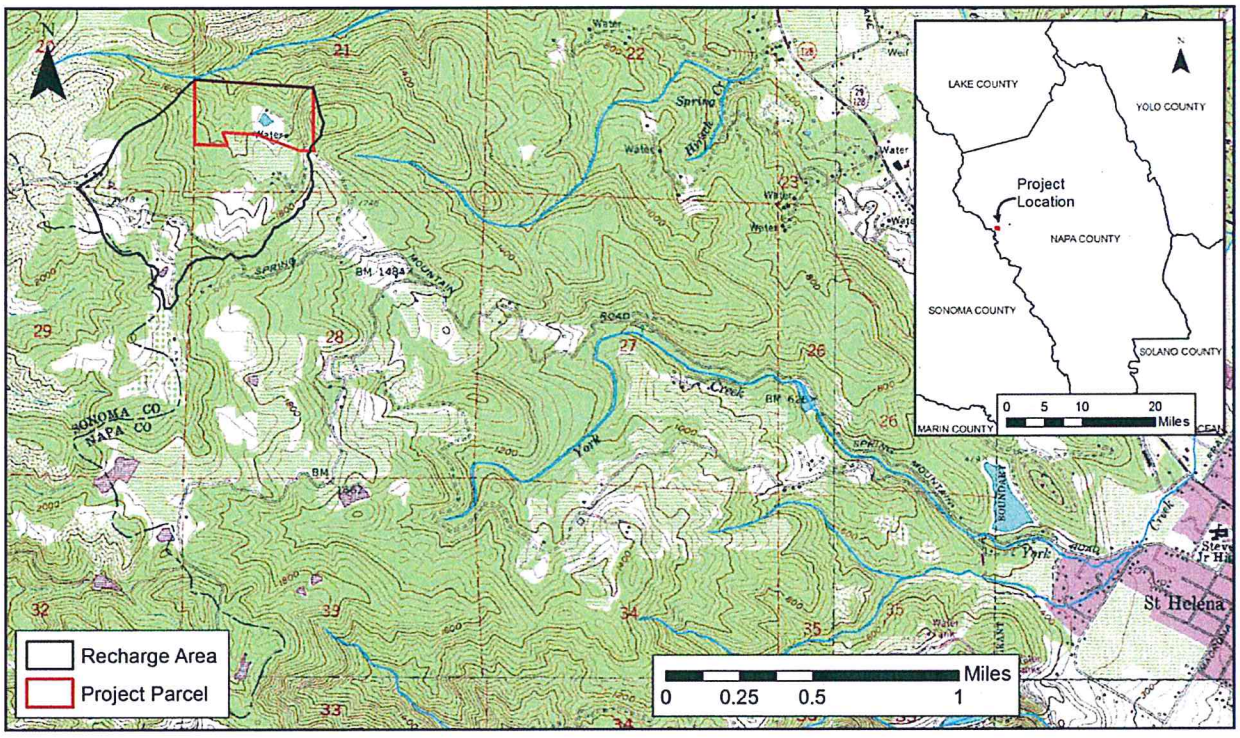

Figure 1. Topography and location map of project site and vicinity.

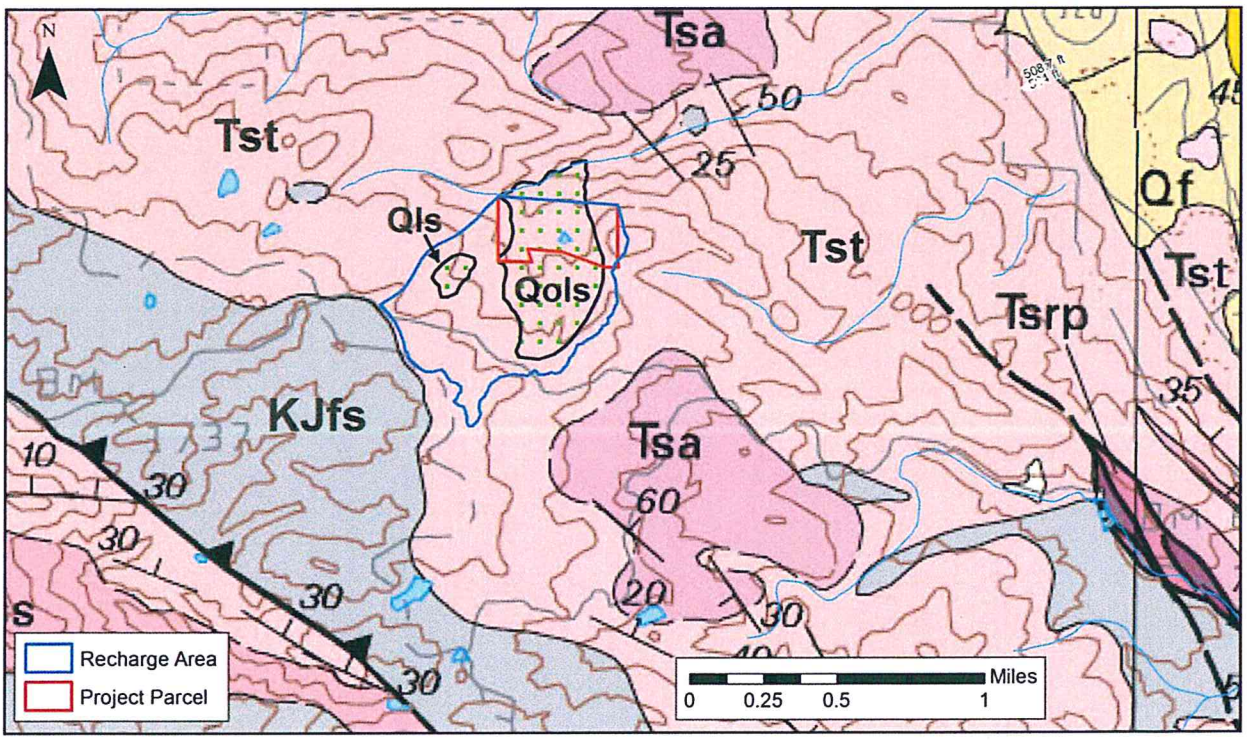

Figure 2. Geologic map of the project site and vicinity (after Graymer et al. 2007 & Delattre and Gutierrez, 2013). Units are as follows: Tst - Pumiceous ash-flow tuff, Tsa - Andesite to basalt lava flows, KJfs - Graywacke and melange, Qf - Alluvial fan deposits, Qls - Landslide deposits, Qols - Older landslide deposits.

Project Description and Water Use

The proposed winery would be built just east of the residence located near the center of the 56.75 acre parcel where an existing outbuilding is presently located. A single-family residence and 8.9 acre vineyard comprise the current use of the parcel. The proposed 20,000 gallon per year winery and an additional 1.0 acre vineyard (already permitted but not yet developed) are the only new land uses on the parcel that would require additional groundwater use.

Anticipated water use was documented in a Water Availability Analysis Phase One Study prepared by Michael Muelrath, PE No. 67435, dated November 14, 2014 (Appendix A) previously submitted to the Department of Public Works (DPW). At that time, the applicant was advised that new guidelines would apply, and that the Phase One Study submitted was no longer sufficient to determine groundwater availability. Nevertheless, the water use estimates for existing and proposed conditions in the November 2014 Phase One Study remain valid and were adopted for this WAA. Existing and proposed water use on the subject parcel is summarized in Table 1. Refer to Appendix A for additional details regarding water use estimates.

Table 1. Existing and Proposed Water Use

Land Use	Existing Water Use (ac-ft/yr)	Proposed Water Use (ac-ft/yr)
Residential	0.75	0.75
Vineyard	4.45	4.95
Winery Process Use	--	0.43
Winery Landscaping	--	1.00
Winery Employee Use	--	0.06
Winery Visitor & Event Use	--	0.05
Total Water Use	**5.20**	**7.24**

Groundwater use for the proposed winery project, including winery production, landscaping, winery visitors and events and winery employees would total 1.54 acre-feet per year. In addition to the winery, an additional 0.5 acre-feet per year is required for the proposed 1.0 acre of additional vineyard. The total increase in use is 2.04 acre-feet per year which represents a 39% increase in groundwater use relative to existing conditions. Under existing conditions, water use is 0.09 ac-ft per acre on the parcel. With expanded water use associated with the proposed winery, water use would be 0.13 ac-ft per acre.

There are two wells located on the project parcel (Figure 3). One well lies approximately 400-ft west of the pond on the western edge of an existing vineyard block and is referred to as the "Irrigation Well". This well provides irrigation water for the existing vineyard and is also the planned water source for the new proposed vineyard. The second well is located in the southeastern portion of the parcel, south of the proposed winery site approximately 100-ft

from the southern parcel boundary and is referred to as the "House Well". It provides potable water for domestic use in the residence on the property and is the proposed source of water for the proposed winery.

Bedrock Geology

The recent U.S. Geological Survey map "Geologic Map and Map Database of Eastern Sonoma and Western Napa Counties, California" (Graymer et al. 2007) and the California Geological Survey map "Preliminary Geologic Map of the Calistoga 7.5' Quadrangle (Delattre and Gutierrez, 2013) were used for interpretation of the project area geology, supplemented by the recent Napa County report "Updated Hydrogeologic Conceptualization and Characterization of Conditions" (Luhdorff & Scalmanini, 2013).

Figures 1 and 2 show the project parcel, topography, and surface geology in the vicinity of the project parcel. The project parcel is located about four miles northwest of central St. Helena in the western hills of the Napa Valley. An older landslide deposit (Qols) is mapped over the majority of the project parcel area.[2] The remainder of the parcel and the surrounding areas consist of the tuffaceous member of the Sonoma Volcanics (map unit Tst), which mantles most of the mountain slopes on the west side of Napa Valley from St. Helena north to Calistoga and beyond.

The Sonoma Volcanics consist of a thick and highly variable series of volcanic rocks including basalt, andesite, and rhyolite lava flows, tuff, tuff breccia, agglomerate, scoria, and their sedimentary derivatives (Kunkel and Upson, 1960). The tuffaceous, scoriaceous, and sedimentary units are the principle water-bearing units whereas the lava flows generally yield little to no water (Kunkel and Upson, 1960; Faye, 1973). The landslide deposits and the tuff underlying the project site are considered the principle water-bearing units contributing recharge to the project wells.

[2] A separate technical memorandum addresses potential slope stability issues at the proposed winery site.

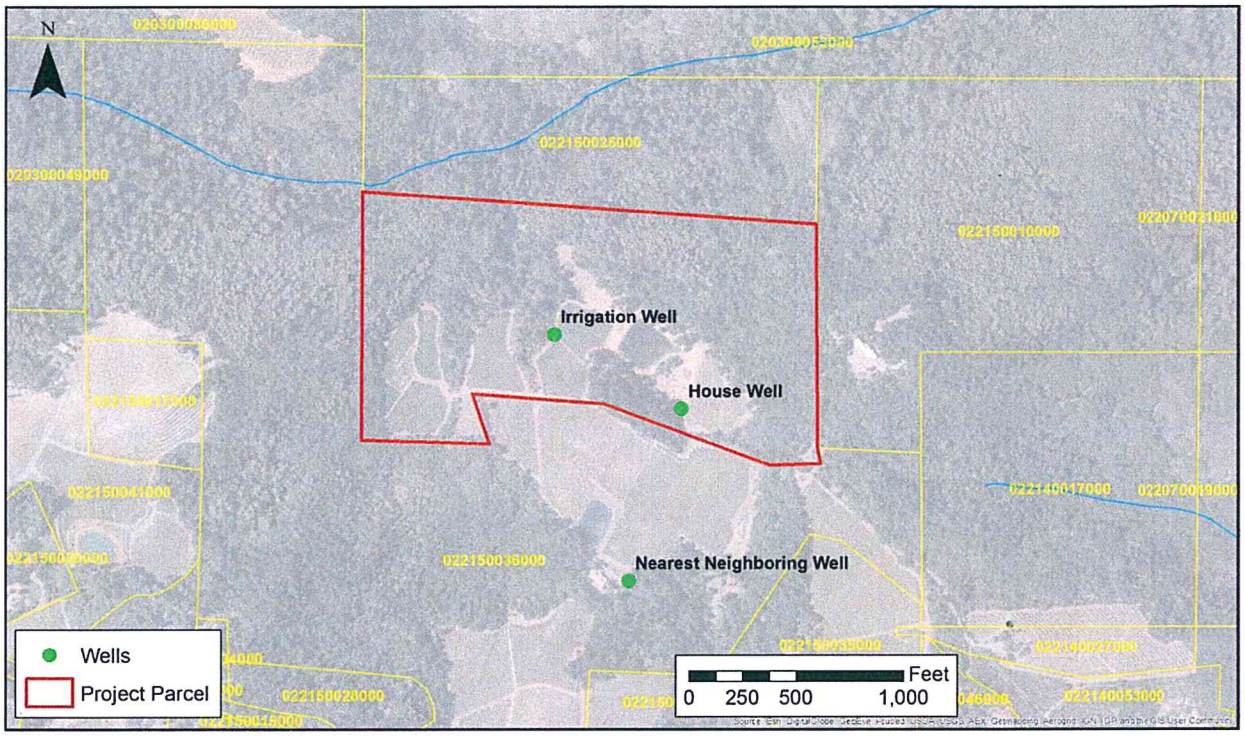

Figure 3. Local area parcel map and well locations.

Hydrogeologic Conditions

The hydrogeology of the project site is influenced by the foregoing geologic characteristics. The tuff is generally a water-bearing unit of the Sonoma Volcanics, but it includes a variety of layered rocks, some of which are not considered water bearing (e.g. andesite flows). This creates the potential for confined aquifer units where aquitards formed by andesite (or other relatively impermeable volcanic materials) separate strata of more permeable rocks. The orientation of rock layers is variable, but dips in the range 25 to 50 degree to the northeast.

It is expected that the elevation of the potentiometric water surface underlying the mountain slopes west of the valley floor will lie more or less parallel to the ground surface. Consequently, there is likely a relatively steep hydraulic gradient extending from the ridge crest about 2,200-ft west of the parcel towards the project parcel. Groundwater recharge to the project site is expected to occur primarily as infiltrated rainfall which flows down-gradient before reaching the wells on the project parcel. The recharge area boundary shown in Figures 1 and 2 represents the drainage area up-gradient of the project parcel that is underlain by the Tst and overlying landslide deposits.

Data describing the geologic materials logged during well construction and the well construction details were obtained from a Well Completion Report for the Irrigation Well (Appendix B). The Well Completion Report for the house well was not located, however constant rate pump test data was available for this well. Water quality analyses were also

available for both wells (Appendix C). The irrigation well was bored to a depth of 340-ft; the perforated interval of the well lies between 97 and 257-ft below ground surface. The upper 80 feet is described as gray volcanic rock and volcanic tuff and the next 175-ft are described as fractured mixed volcanics. It is likely that most or all of these materials are actually landslide deposits comprised of large blocks of Sonoma Volcanics. This well produced 30 gallons per minute when tested at the time of completion in September of 1999. The House Well is 171-feet deep and produced 6 gallons per minute when tested in March of 2012. The water quality data from both wells (Appendix C) are very similar suggesting that both wells draw groundwater from a similar source.

The constant rate pump test results for the House Well were used to estimate the hydraulic conductivity (K) of the aquifer material. S_c was calculated as 0.107 gpm per foot of drawdown by dividing the steady state pumping rate by the drawdown. Transmissivity (T) was approximated from the specific capacity (S_c) of the well at the conclusion of the pump test according to the procedure suggested by Weight and Sonderegger (2001, p. 431). T was estimated to be 2.78 ft^2/day based on an empirical relationship for fractured bedrock aquifers relating T to specific capacity: $T = 38.9 (S_c)^{1.18}$. Hydraulic conductivity of the aquifer was estimated from the definition T = K*b, where K is hydraulic conductivity (ft/day) and b is saturated thickness in feet. From these data we estimated that K is on the order of 0.033 ft/day. This hydraulic conductivity agrees well with previous estimates (0.01 to 0.1 ft/day) of the hydraulic conductivity of the tuffaceous units of the Sonoma Volcanics (Faye, 1973) suggesting that the hydraulic characteristics of the landslide deposits that the well is completed within are generally similar to those of the tuff (map unit Tst). Based in part on this data, we chose to consider the landslide deposits and the Tst as a single aquifer unit.

Water Balance

The Soil Water Balance (SWB) model developed by the U.S. Geological Survey (Westenbroek et al. 2010) was used to produce a spatially distributed estimate of annual recharge in the vicinity of the 3646 SMR Vineyard Winery. This model calculates runoff based on the Natural Resources Conservation Service (NRCS) curve number approach and calculates actual evapotranspiration (AET) and recharge based on a modified Thornthwaite-Mather soil-water-balance approach (Westenbroek et al. 2010). The project aquifer recharge area was defined as the portion of the drainage area up-gradient of the project parcel that is underlain by landslide deposits and the tuffaceous unit of the Sonoma Volcanics (Tst) which is approximately 245.5 acres in size.

Model Development

The model was developed using a 10-meter resolution rectangular grid and water budget calculations were made on a daily time step. Key spatial inputs included a flow direction raster developed from the USGS 10-meter resolution Digital Elevation Model, a land cover dataset

developed from the NRCS's 2011 National Land Cover Database (Figure 5) and refined through interpretation of aerial photography, and a distribution of hydrologic soil groups and available water capacity (AWC) developed from the NRCS Soil Survey Geographic Database (SSURGO) (Figure 6).

A series of model parameters were assigned for each land cover type/soil group combination including a curve number, a maximum infiltration rate, an interception storage value, and a rooting depth (Table 2). Curve numbers were assigned based on standard NRCS values. As described above under Hydrogeologic Conditions, results from a constant rate pump test for the House Well were used to estimate the hydraulic conductivity (K) of the aquifer material which was used to define the maximum infiltration rate as 0.033 ft/day. Interception storage values and rooting depths were assigned based on literature values and previous modeling experience. Infiltration rates for hydrologic soil groups A through D were applied based on Cronshey et al. (1986) (Table 3) along with default soil-moisture-retention relationships based on Thornthwaite and Mather (1957) (Figure 4).

Daily precipitation and daily minimum, maximum, and mean air temperature data were compiled for the St. Helena 4 WSW climate station which is located ~2.4 miles south of the project parcel just east of the Mark West Creek/Napa River watershed divide at an elevation of 1,780 feet (Figure 7). Based on the PRISM dataset, the 1980 to 2010 mean annual precipitation at the climate station location was 45.4 inches versus 44.2 inches for the project recharge area (PRISM, 2010). The precipitation data was scaled down by a factor of 0.97 to account for the small differences in precipitation between the station location and the project recharge area. Water Year 2010 was selected to represent average water year conditions for the analysis because it represents a recent year with near long-term average precipitation conditions (46.5 inches at the scaled St. Helena station versus 44.2 inches for the 1980 - 2010 average). The model was also evaluated for water year 2014 to represent drought conditions. Water year 2014 precipitation was 27.6 inches or approximately 62% of long-term average conditions.

Table 2: Soil and land cover properties used in the SWB model.

Land Cover	Curve Number				Maximum Infiltration Rate (in/day)	Interception Storage Values		Rooting Depths (ft)			
	A Soils	B Soils	C Soils	D Soils		Growing Season	Dormant Season	A Soils	B Soils	C Soils	D Soils
water	100	100	100	100	0.39	0.000	0.000	0.00	0.00	0.00	0.00
developed open space	59	74	82	86	0.39	0.010	0.005	2.30	2.10	2.00	1.80
developed - low intensity	59	74	82	86	0.39	0.010	0.005	2.30	2.10	2.00	1.80
developed - med intensity	61	75	83	87	0.39	0.005	0.002	2.30	2.10	2.00	1.80
developed - high intensity	77	85	90	92	0.39	0.005	0.002	2.30	2.10	2.00	1.80
barren	77	86	91	94	0.39	0.000	0.000	0.00	0.00	0.00	0.00
deciduous forest	30	55	70	77	0.39	0.050	0.020	5.90	5.10	4.90	4.70
evergreen forest	30	55	70	77	0.39	0.050	0.050	4.90	4.20	4.00	3.90
mixed forest	30	55	70	77	0.39	0.050	0.035	5.40	4.70	4.50	4.30
shrub/scrub	30	48	65	73	0.39	0.080	0.015	3.20	2.80	2.70	2.60
grassland/herbaceous	30	58	71	78	0.39	0.005	0.004	1.30	1.10	1.00	1.00
pasture	39	61	74	80	0.39	0.080	0.015	1.30	1.10	1.00	1.00
vineyard	38	61	75	81	0.39	0.080	0.015	2.20	2.10	2.00	1.90
woody wetlands	87	89	90	91	0.39	0.050	0.035	5.40	4.70	4.50	4.30
herbaceous wetland	88	90	91	92	0.39	0.000	0.000	1.30	1.10	1.00	1.00

Table 3: Infiltration rates for NRCS hydrologic soil groups (Cronshey et al., 1986).

Soil Group	Infiltration Rate (in/hr)
A	> 0.3
B	0.15 - 0.3
C	0.05 - 0.15
D	<0.05

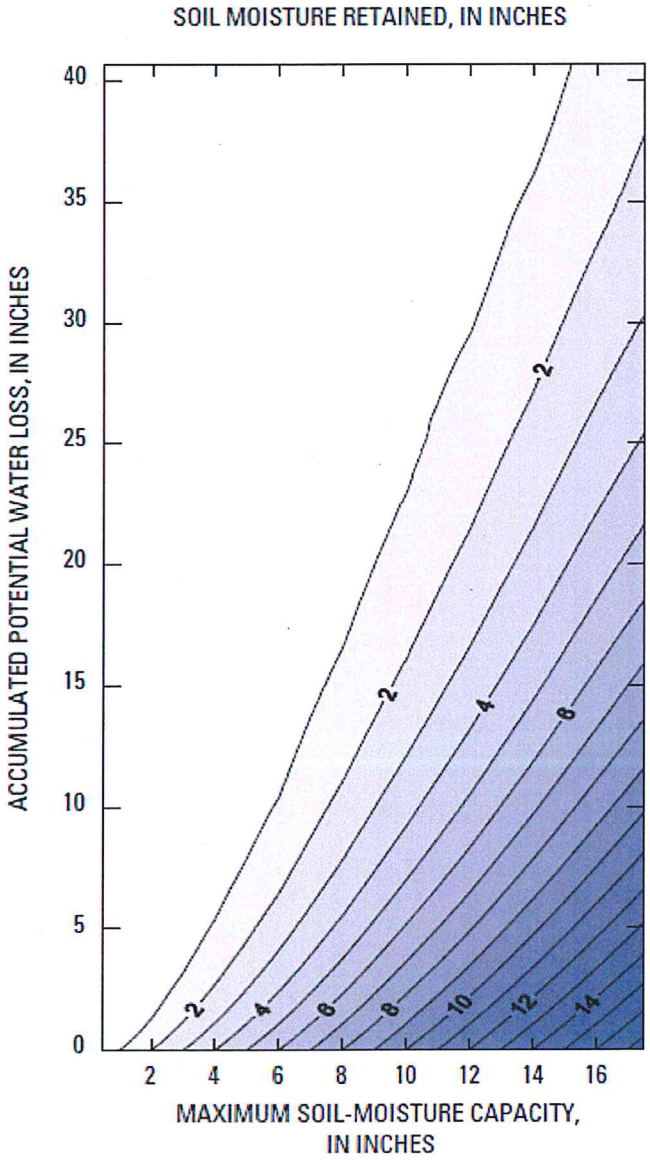

Figure 4: Soil-moisture-retention table (Thornthwaite and Mather, 1957).

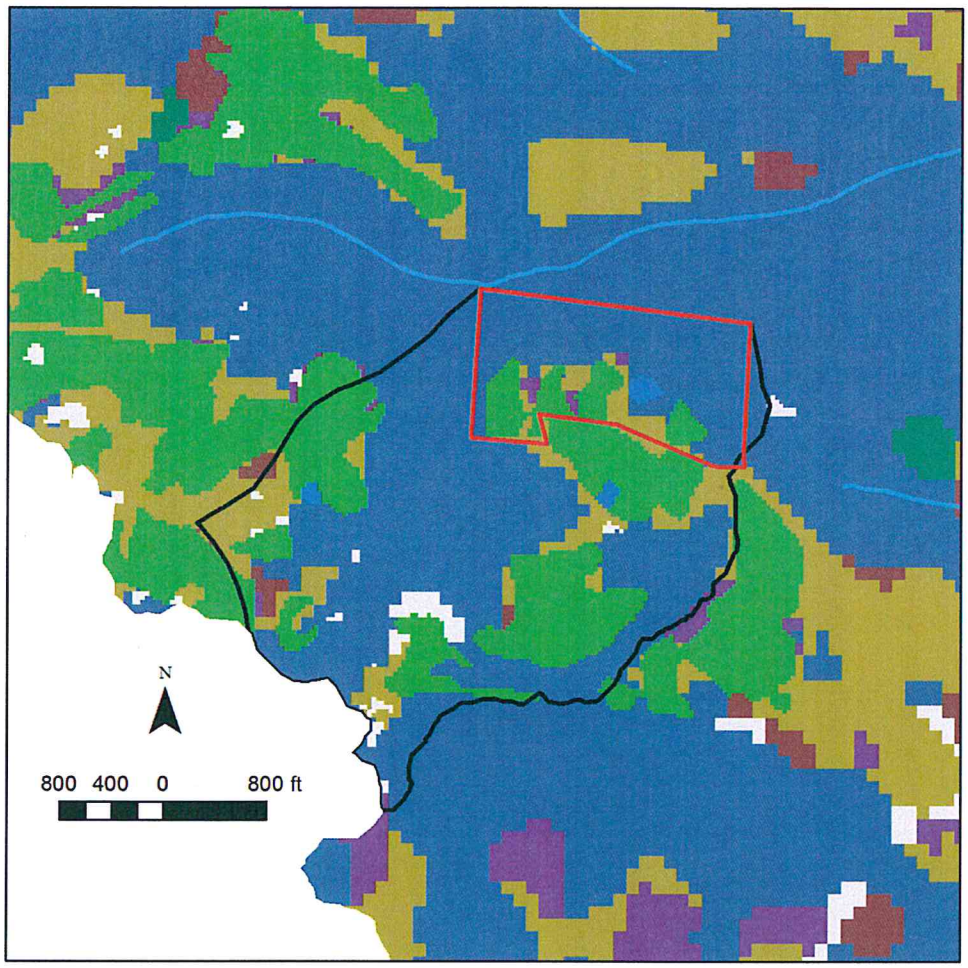

Figure 5: Land cover map used in the SWB model.

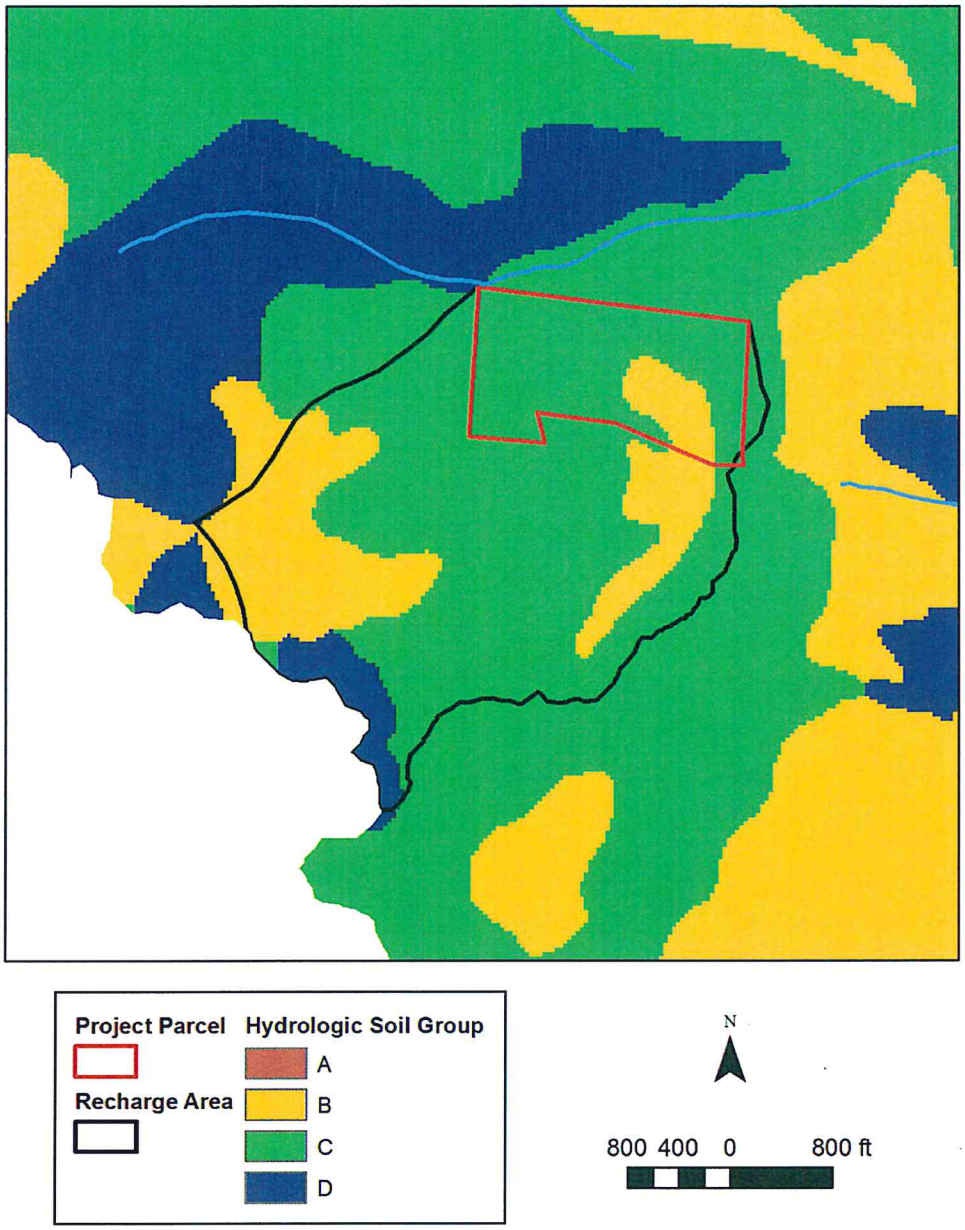

Figure 6: Soils map used in the SWB model.

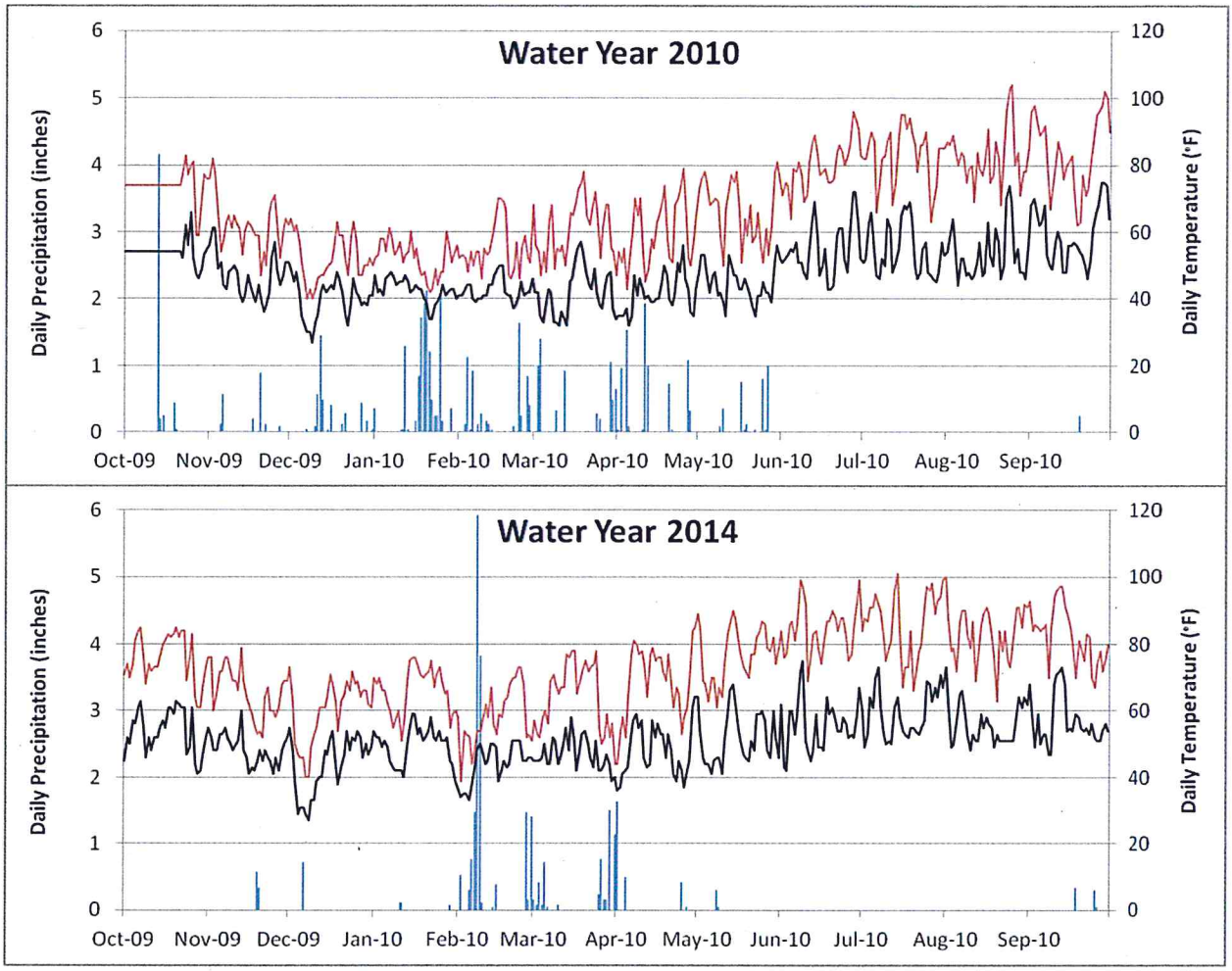

Figure 7: Daily precipitation and minimum and maximum air temperature used in the SWB model.

Results

The simulated Water Year 2010 (average water year) recharge results indicate that recharge varied across the project recharge area from ~6.6 to ~13.7 inches with the exception of areas classified as water where the model assumes zero recharge (Figure 8 and Table 4). Spatially averaged over the project recharge area, the 46.5 inches of precipitation was partitioned as follows: AET = 22.1 inches, Runoff = 14.8 inches, and Recharge = 9.7 inches. The simulated water year 2014 (dry water year) recharge results indicate that recharge varied across the project recharge area from ~1.4 to ~7.4 inches with the exception of areas classified as water where the model assumes zero recharge (Figure 9 and Table 4). Spatially averaged over the project recharge area, the 27.6 inches of precipitation was partitioned as follows: AET = 14.5 inches, Runoff = 9.9 inches, and Recharge = 3.2 inches. The recharge results can also be expressed as a total volume by multiplying the calculated recharge by the project aquifer

recharge area of 245.5 acres. This calculation yields an estimate of total recharge of 65.5 ac-ft for the dry water year of 2014 and 198.4 ac-ft for the average water year of 2010.

Water budget estimates are available for several larger watershed areas nearby including the Santa Rosa Plain, the Napa River Watershed above St. Helena, and the Sonoma Valley. Comparisons to these water budgets are useful for determining the overall reasonableness of the results although one would not expect precise agreement owning to significant variations in climate, land cover, soil types, and underlying hydrogeologic conditions.

The simulated Water Year 2010 average AET for the project recharge area represents ~47% of the precipitation. This is in close agreement with the results from neighboring watersheds where mean annual ET was estimated to be equivalent to between 45% and 52% of mean annual precipitation (Farrar et. al., 2006, Luhdorff and Scalmanini, 2013; Woolfenden and Havesi, 2014). The simulated Water Year 2010 runoff for the project recharge area represents ~32% of the precipitation. This is somewhat lower than the results from neighboring watersheds where mean annual runoff was estimated to be equivalent to between 38% and 43% of mean annual precipitation. The simulated water year 2010 groundwater recharge for the watershed represents ~21% of the precipitation. This is somewhat higher than the results from neighboring watersheds where mean annual recharge was estimated to be equivalent to between 7% and 14% of mean annual precipitation (Farrar et. al., 2006, Luhdorff and Scalmanini, 2013; Woolfenden and Havesi, 2014).

Table 4: Summary of water balance results from the SWB model.

	WY 2010		WY 2014	
	inches	% of precipitation	inches	% of precipitation
Precipitation	46.5		27.6	
AET	22.1	47%	14.5	53%
Runoff	14.8	32%	9.9	36%
Recharge	9.7	21%	3.2	12%

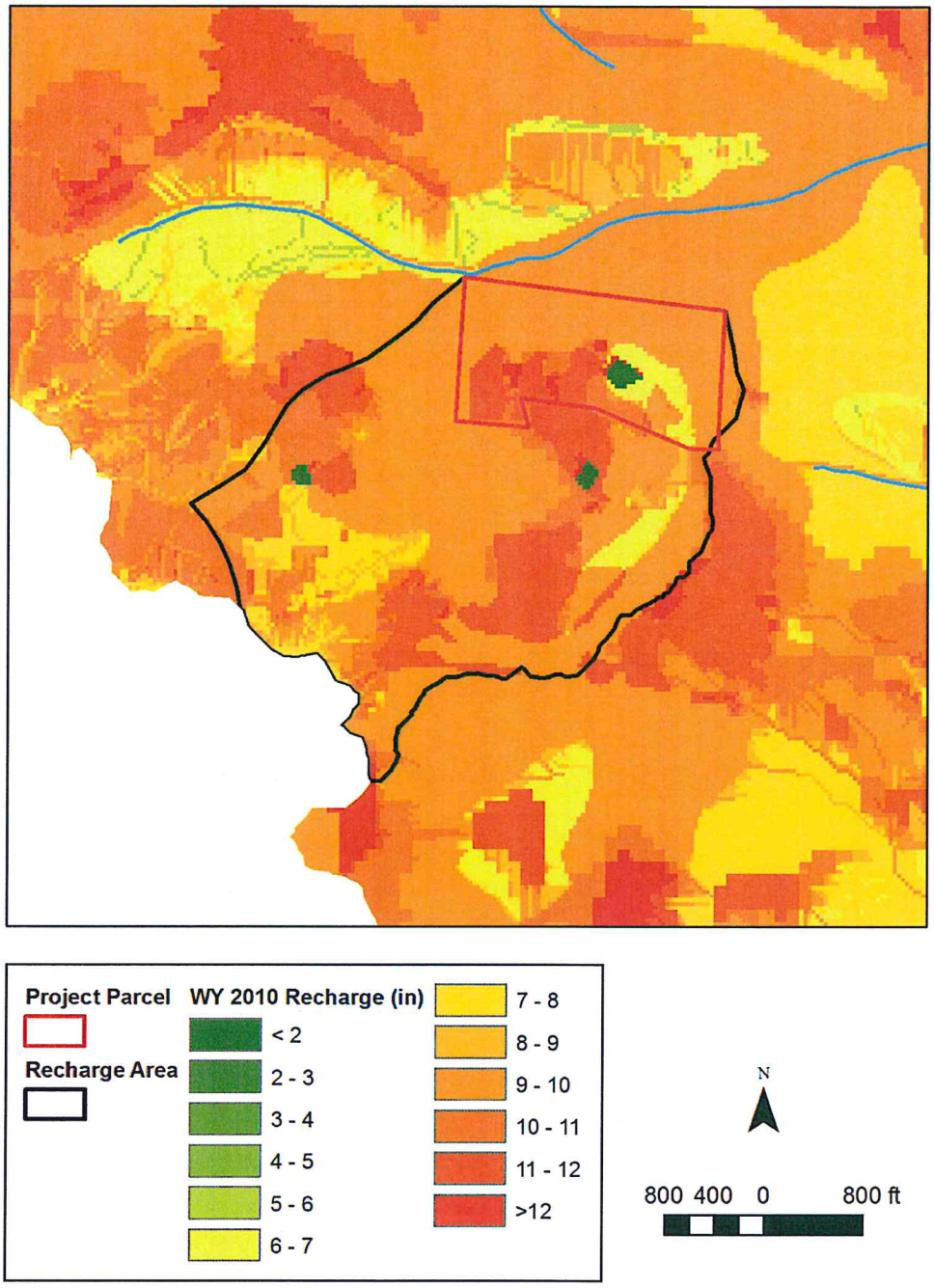

Figure 8: WY 2010 recharge simulated with the SWB model.

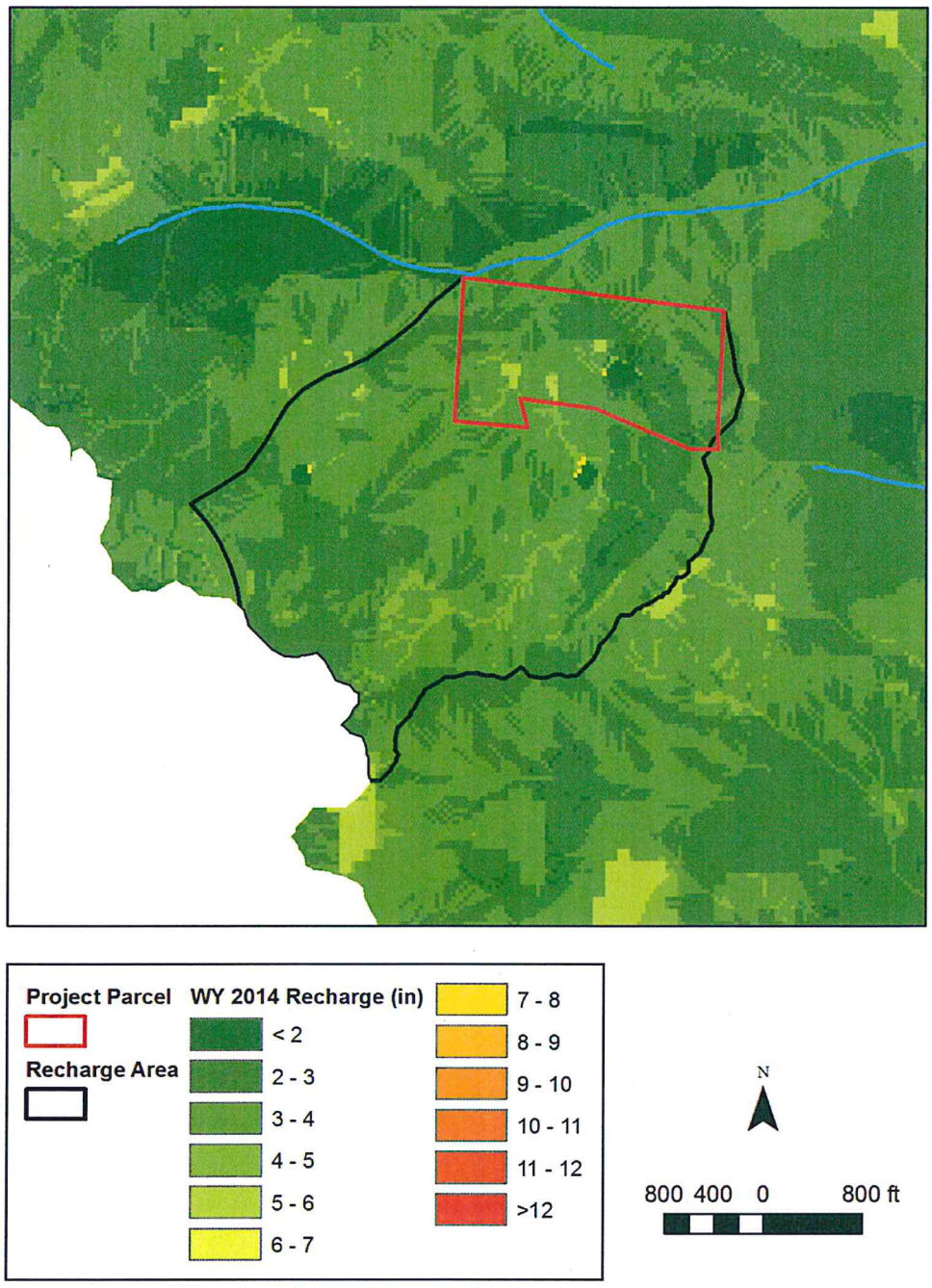

Figure 9: WY 2014 recharge simulated with the SWB model.

Well Interference Potential

The project well, also referred to as the "House Well", is located 800 feet (horizontal distance) north of the nearest off-site neighboring well on the adjacent Keenan property (Figure 3). The WAA guidance document regarding well interference states that "...the Tier 2 well interference criterion is presumptively met if there are no non-project wells located within 500 feet of the existing or proposed project well(s)[3]..." Given the location of the project well 800 feet from the nearest neighboring well, no further evaluation of potential well interference is required.

Conclusion

Mean annual groundwater recharge to the project aquifer is estimated to vary between 65.5 acre-feet during the dry water year of 2014 and 198.5 acre-feet during the average water year of 2010. The total water demand under proposed conditions is 7.24 acre-feet per year which is equivalent to 11% of the dry year recharge and <4% of the average year recharge. The incremental increase in proposed water use of 2.04 acre-feet per year represents an increase of ~1% of the average year recharge. Even if the recharge area is restricted to only include the project parcel area, the average water year recharge would be 45.9 acre-feet and the total proposed water use would be equivalent to only 13% of the recharge. Similarly, under dry-year conditions, recharge for the project parcel would be 14.8 acre-feet, and total proposed use would be equivalent to 49% of recharge for the parcel area.

Given the fact that the proposed use is significantly less than the contributing recharge even during the very dry water year of 2014 it is highly unlikely that the proposed pumping would result in long-term declines in groundwater elevations or depletion of groundwater resources. The nearest neighbor's well is located 800 feet from the proposed project well, indicating that potential well interference is negligible and requiring no further evaluation per the WAA procedures.

[3] Water Availability Analysis (WAA), Adopted May 12, 2015 by Board of Supervisors, County of Napa, p. 8.

References

Cronshey, R., McCuen, R., Miller, N., Rawls, W., Robbins, S., and Woodward, D., 1986. Urban hydrology for small watersgeds - TR-55 (2nd ed.), Washington, D.C., U.S. Department of Agriculture, Soil Conservation Service, Engineering Division, Technical Release 55, 164 p.

Delattre, M.P., and Gutierrez, C.I., 2013. Preliminary Geologic Map of the Calistoga 7.5' Quadrangle, Napa and Sonoma Counties, California: A Digital Database, California Geologic Survey.

Farrrar, C.D., Metzger, L.F., Nishikawa, T., Koczot, K.M., and Reichard, E.G., 2006. Geohydrological Characterization, Water-Chemistry, and Ground-water Flow Simulation Model of the Sonoma Valley Area, Sonoma County, California, U.S. Geological Survey Scientific Investigations Report 2006-5092.

Graymer, R.W. et. al., 2007. Geologic Map and Map Database of Eastern Sonoma and Western Napa Counties, California. Pamphlet to accompany SCIENTIFIC INVESTIGATIONS MAP 2956. U.S.Department of the Interior U.S. Geological Survey.

Faye, R.R., 1973. Ground-water Hydrology of Northern Napa Valley California, U.S. Geological Survey Water Resources Investigations Report 13-73.

Luhdorff and Scalmanini Consulting Engineers and MBK Engineers, 2013. Updated Hydrogeologic Conceptualization and Characterization of Conditions, prepared for Napa County.

PRISM, 2010. 30 arcsecond resolution gridded total precipitation data for the conterminous United States, PRISM Climate Group, Oregon State University, www.prismclimate.org.

Thornthwaite, C.W., and Mather, J.R., 1957. Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, Publications in Climatology, v. 10, no. 3, pgs 185-311.

Weight, W. and Sonderegger, J., 2000. Manual of Applied Field Hydrogeology, McGraw-Hill. 608 p.

Westenbroek, S.M., Kelson, V.A., Dripps, W.R., Hunt R.J., and Bradbury, K.R., 2010. SWB - A Modified Thornthwaite-Mather Soil-Water-Balance Code for Estimating Groundwater Recharge, U.S. Geological Survey Techniques and Methods 6-A31, 60 pgs.

Woolfenden, L.R., and Hevesi, J.A., 2014. Chapter E: Santa Rosa Plain Hydrologic Model Results, in Simulation of Groundwater and Surface Water Resources of the Santa Rosa Plain Watershed, Sonoma County, California, U.S. Geological Survey Scientific Investigations Report 2014-5052.

Appendix A - Phase 1 Water Availability Assessment, November 2014

A Tradition of Stewardship
A Commitment to Service

Department of Public Works

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Donald G. Ridenhour, P.E.
Director

WATER AVAILABILITY ANALYSIS - PHASE ONE STUDY

Introduction: As an applicant for a permit with Napa County, It has been determined that Chapter 13.15 of the Napa County Code is applicable to approval of your permit. One step of the permit process is to adequately evaluate the amount of water your project will use and the potential impact your application might have on the static groundwater levels within your neighborhood. The public works department requires that a Phase 1 Water Availability Analysis (WAA) be included with your application. The purpose of this form is to assist you in the preparation of this analysis. You may present the analysis in an alternative form so long as it substantially includes the information required below. Please include any calculations you may have to support your estimates.

The reason for the WAA is for you, the applicant, to inform us, to the best of your ability, what changes in water use will occur on your property as a result of an approval of your permit application. By examining the attached guidelines and filling in the blanks, you will provide the information we require to evaluate potential impacts to static water levels of neighboring wells.

Step #1:

Provide a map and site plan of your parcel(s). The map should be an 8-1/2"x11" reproduction of a USGS quad sheet (1:24,000 scale) with your parcel outlined on the map. Include on the map the nearest neighboring well. The site plan should be an 8-1/2"x11" site plan of your parcel(s) with the locations of all structures, gardens, vineyards, etc in which well water will be used. If more than one water source is available, indicate the interconnecting piping from the subject well to the areas of use. Attach these two sheets to your application. If multiple parcels are involved, clearly show the parcels from which the fair share calculation will be based and properly identify the assessor's parcel numbers for these parcels. Identify all existing or proposed wells

Step #2: Determine total parcel acreage and water allotment factor. If your project spans multiple parcels, please fill a separate form for each parcel.

Determine the allowable water allotment for your parcels:

Parcel Location Factors

The allowable allotment of water is based on the location of your parcel. There are 3 different location classifications. Valley floor areas include all locations that are within the Napa Valley, Pope Valley and Carneros Region, except for areas specified as groundwater deficient areas. Groundwater deficient areas are areas that have been determined by the public works department as having a history of problems with groundwater. All other areas are classified as Mountain Areas.

Please underline your location classification below (Public Works can assist you in determining your classification if necessary):

Valley Floor	**1.0 acre feet per acre per year**
Mountain Areas	**0.5 acre feet per acre per year**
MST Groundwater Deficient Area	**0.3 acre feet per acre per year**

Assessor's Parcel Number(s)	Parcel Size (A)	Parcel Location Factor (B)	Allowable Water Allotment (A) X (B)
022-150-026	56.75 ± ac	0.5 af/yr	28.3 af/yr

Step #3:

Using the guidelines in Attachment A, tabulate the existing and projected future water usage on the parcel(s) in acre-feet per year (af/yr). Transfer the information from the guidelines to the table below.

EXISTING USE:		PROPOSED USE:	
Residential	.75 af/yr	Residential	.75 af/yr
Farm Labor Dwelling	0 af/yr	Farm Labor Dwelling	0 af/yr
Winery	0 af/yr	Winery	0.43 af/yr
Commercial	0 af/yr	Commercial	0 f/yr
Vineyard*	4.45 af/yr	Vineyard*	4.95 af/yr
Other Agriculture	0 af/yr	Other Agriculture	0 af/yr
Landscaping	0 af/yr	Landscaping	1 af/yr
Other Usage (List Separately):		Other Usage (List Separately):	
_____	_____ af/yr	Winery Emp	.06 af/yr
_____	_____ af/yr	Winery Visitors	.03 af/yr
_____	_____ af/yr	Winery Events	.02 af/yr
TOTAL:	5.20 af/yr	**TOTAL:**	7.24 af/yr **TOTAL:**
	1.69 M gallons**	**TOTAL:**	2.36 M gallons**

Is the proposed use less than the existing usage? ☐ **Yes** ☐ **No** ☐ **Equal**

Step #4:

Provide any other information that may be significant to this analysis. For example, any calculations supporting your estimates, well test information including draw down over time, historical water data, visual observations of water levels, well drilling information, changes in neighboring land uses, the usage if other water sources such as city water or reservoirs, the timing of the development, etc. Use additional sheets if necessary.

See attached for breakdown of water use estimates.

There are two wells on the property which have been tested at 6 gpm and 34 gpm.

There are no known wells located within 500 feet of the well that will be used to serve the winery.

Conclusion: Congratulations! Just sign the form and you are done! Public works staff will now compare your projected future water usage with a threshold of use as determined for your parcel(s) size, location, topography, rainfall, soil types, historical water data for your area, and other hydrogeologic information. They will use the above information to evaluate if your proposed project will have a detrimental effect on groundwater levels and/or neighboring well levels. Should that evaluation result in a determination that your project may adversely impact neighboring water levels, a phase two water analysis may be required. You will be advised of such a decision.

REGISTERED PROFESSIONAL ENGINEER
MICHAEL R. MILRATH
NO. 67435
Exp. 12/31/2014
CIVIL
STATE OF CALIFORNIA

Signature: _____ **Date:** 11/14/2014 **Phone:** (707) 320-4968

Attachment A: Estimated Water Use Guidelines

Typical Water Use Guidelines:

Primary Residence	0.5 to 0.75 acre-feet per year (includes some landscaping)
Secondary Residence	0.20 to 0.30 acre-feet per year
Farm Labor Dwelling	0.06 to 0.10 acre-feet per person per year

Non-Residential Guidelines:

Agricultural:

Vineyards	
Irrigation only	0.2 to 0.5 acre-feet per acre per year
Heat Protection	0.25 acre feet per acre per year
Frost Protection	0.25 acre feet per acre per year
Farm Labor Dwelling	0.06 to 0.10 acre-feet per person per year
Irrigated Pasture	4.0 acre-feet per acre per year
Orchards	4.0 acre-feet per acre per year
Livestock (sheep or cows)	0.01 acre-feet per acre per year

Winery:

Process Water	2.15 acre-feet per 100,000 gal. of wine
Domestic and Landscaping	0.50 acre-feet per 100,000 gal. of wine

Industrial:

Food Processing	31.0 acre-feet per employee per year
Printing/Publishing	0.60 acre-feet per employee per year

Commercial:	
Office Space	0.01 acre-feet per employee per year
Warehouse	0.05 acre-feet per employee per year

WATER USE ESTIMATE CALCULATIONS

	Estimated Water Use (Acre-Feet / Year)		
	Existing	Proposed	Notes
Residential Domestic Water Use			
Existing Residence	0.75	0.75	Based on Napa County Phase 1 Water Availability Analysis Guidelines (Primary Residence)
Total Residential Domestic Water Use	0.75	0.75	
Winery Domestic & Process Water Use			
Winery - Daily Visitors	0.00	0.03	Based on 65 visitors / week max @ 3 gallons per visitor[1]
Winery - Events with Meals Prepared Onsite	0.00	0.02	Based on 12 events @ 20 people, 12 events @ 12 people @ 15 gallons per guest [2]
Winery - Events with Catered Meals	0.00	0.00	Based on 2 events @ 50 people, 1 event @ 100 people @ 5 gallons per guest [3]
Winery - Employees	0.00	0.06	Based on 6 employees @ 0.01 ac-ft/yr per employee per Napa County Phase 1 Water Availability Analysis Guidelines
Winery - Process	0.00	0.43	Based on 7 gallons of water per gallon of wine[4] @ 20,000 gallons max production
Total Winery Water Use	0.00	0.54	
Irrigation Water Use			
Landscape	0.00	1.00	Based on 0.5 acres of new moderate water use landscaping at 2 ac-ft/ac/yr
Vineyard	4.45	4.95	Existing based on 4.5 ac existing vineyard @ 0.5 ac-ft/yr per acre per Napa County Phase 1 Water Availability Analysis Guidelines.
			Proposed includes up to 9.9 acres total which is the area approved under 98233-ECPA.
Total Irrigation Water Use	4.45	5.95	
Total Combined Water Use	5.20	7.24	

[1] 3 gallons of water per visitor is based on project wastewater disposal feasibility report by Applied Civil Engineering.

[2] 15 gallons of water per guest is based on project wastewater disposal feasibility report by Applied Civil Engineering.

[3] 5 gallons of water per guest is based on project wastewater disposal feasibility report by Applied Civil Engineering.

[4] Napa County Phase 1 Water Availability Analysis Guidelines estimate 7 gallons of water per gallon of wine produced.

Appendix B - Water Quality Analyses

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E-MAILED

Thursday, April 12, 2012

Sherry Salinas
McLean and Williams, Inc.
878 El Centro Avenue
Napa, CA 94558

RE: Lab Order: M031037 Collected By: NAHUM
Project ID: 3646 SPRING MT RD-HOUSE WELL PO/Contract #:

Dear Sherry Salinas:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, March 23, 2012. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Patrick J Barnard

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Lab Order: M031037

Project ID: 3646 SPRING MT RD-HOUSE WELL

Lab ID	Sample ID	Matrix	Date Collected	Date Received
M031037001	WELL HEAD	Water	3/23/2012 14:04	3/23/2012 16:43
M031037002	WELL HEAD	Water	3/23/2012 14:04	3/23/2012 16:45

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NARRATIVE

Lab Order: M031037

Project ID: 3646 SPRING MT RD-HOUSE WELL

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than 1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis were not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

J - reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

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ANALYTICAL RESULTS

Lab Order: M031037

Project ID 3646 SPRING MT RD-HOUSE WELL

Lab ID:	**M031037001**	Date Collected:	3/23/2012 14:04	Matrix:	Water
Sample ID:	**WELL HEAD**	Date Received:	3/23/2012 16:43		

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
Alkalinity, Total (as CACO3)	70	mg/L	10	1			04/05/12 15:24	WTI 2191	
Bicarbonate (as HCO3)	86	mg/L	12	1			04/05/12 15:24	WTI 2191	
Carbonate (as CO3)	ND	mg/L	6.0	1			04/05/12 15:24	WTI 2191	
Hydroxide (as OH)	ND	mg/L	1.7	1			04/05/12 15:24	WTI 2191	

Lab ID:	**M031037002**	Date Collected:	3/23/2012 14:04	Matrix:	Water
Sample ID:	**WELL HEAD**	Date Received:	3/23/2012 16:45		

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
Metals Analysis by ICPMS	**Prep Method:**	EPA 200.8			**Prep by:** UK				
	Analytical Method:	EPA 200.8					**Analyzed by:** SMD		
Copper	1.5	ug/L	0.50	1	03/30/12 00:00	MPR 10782	04/10/12 10:40	MMS 6328	
Lead	0.31	ug/L	0.25	1	03/30/12 00:00	MPR 10782	04/05/12 11:17	MMS 6328	

REPORT OF LABORATORY ANALYSIS

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The following information is from California Code of Regulations Title 22, Napa County Env. Health "Interpreting Drinking Water Test Results" and UC Davis Department of Land, Air, and Water Resources - Cooperative Extension. This information is provided for your convenience. Caltest does not provide consultation regarding the suitability of water for a given purpose.

Arsenic has a drinking water Maximum Contaminant Level (MCL) of 10 ug/L (ppb) or 0.010 mg/L (ppm)

Boron has an agricultural recommended limit and a state drinking water Action (Advisory) Limit of 1000 ug/L (ppb) or 1 mg/L (ppm). Boron affects the health and production of boron sensitive plants. Drinking water with greater than 10 times the Action Limit Level are recommended for removal from service.

Calcium and **Magnesium** are related to water hardness. See Hardness remarks.

Chloride has a drinking water Maximum Contaminant Level (MCL) of 600 mg/L, with a recommended level of 250 mg/L and a short-term limit of 600 mg/L.

Copper has a drinking water Maximum Contaminant Level (MCL) of 1000 ug/L (ppb) or 1 mg/L (ppm).

Electrical Conductance has a drinking water Maximum Contaminant Level (MCL) of 1,600 umhos/cm, with a recommended level of 900 umhos/cm and a short term limit of 2,200 umhos/cm. Electrical Conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25 degrees C.

Fluoride has a recommended level of 1.0 mg/L in temperate climates. Fluoride in concentrations greater than 3 mg/L can cause dental fluorosis (a brownish discoloration of the teeth).

Iron has a drinking water Maximum Contaminant Level (MCL) of 300 ug/L (ppb) or 0.3 mg/L (ppm).

Hardness is due primarily to calcium and magnesium carbonates and bi-carbonates. Up to 60 mg/L is SOFT. Between 60 to 120 mg/L is MODERATE (typically most desirable). Between 120 to 180 mg/L is HARD. Over 180 mg/L is VERY HARD.

Manganese has a drinking water Maximum Contaminant Level (MCL) of 50 ug/L (ppb) or 0.05 mg/L (ppm).

Sodium has a recommended limit of 100 mg/L. According to the American Heart Association, water containing more than 270 mg/L should not be
consumed by those on a moderately restricted sodium diet.

Nitrate as N, has a drinking water Maximum Contaminant Level (MCL) of 10 mg/L.
Nitrate as NO3 has a drinking water MCL of 45 mg/L.

Lead has a drinking water Action Limit of 15 ug/L (ppb) or 0.015 mg/L (ppm).

pH suggested level is 6.5 - 8.5.

Silica has a recommended limit of 70 mg/L. Silica in water may etch various household materials such as leaded crystal, marble, tile, windows, and porcelain.

Sulfate has a drinking water Maximum Contaminant Level (MCL) of 500 mg/L, with a recommended level of 250 mg/L and a short term limit of 600 mg/L.

Zinc has a drinking water Maximum Contaminant Level (MCL) of 5000 ug/L (ppb) or 5 mg/L (ppm).

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ENVIRONMENTAL ANALYSES

ANALYTICAL RESULTS

Lab Order: M031037

Project ID 3646 SPRING MT RD-HOUSE WELL

Lab ID: M031037001 Date Collected: 3/23/2012 14:04 Matrix: Water

Sample ID: WELL HEAD Date Received: 3/23/2012 16:43

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
pH, Electrometric Analysis	**Analytical Method:**		SM20-4500-H B				**Analyzed by:**	ALO	
pH	6.6	pH Units		1			03/24/12 13:03	BIO 10850	
Total Coliform & E. coli Analysis	**Prep Method:**		ONPG-MUG		**Prep by:**	BCP			
	Analytical Method:		ONPG-MUG				**Analyzed by:**	MYS	
Total Coliform	ABSENT			1	03/24/12 10:22	BML 7358	03/25/12 10:58	BML 7359	
E. Coli	ABSENT			1	03/24/12 10:22	BML 7358	03/25/12 10:58	BML 7359	
Calculation, Hardness	**Analytical Method:**		Calculation				**Analyzed by:**	LM	
Hardness Calculation	55	mg/L	0.5	1			04/02/12 00:00	CALC	
Calculation, Total Anions	**Analytical Method:**		Calculation				**Analyzed by:**	TS	
Total Anions	1.5	meq/L		1			04/05/12 15:24	CALC	
Calculation, Total Cations	**Analytical Method:**		Calculation				**Analyzed by:**	LM	
Total Cations	1.5	meq/L		1			04/02/12 00:00	CALC	
Metals Analysis by ICP	**Prep Method:**		EPA 200.2		**Prep by:**	UK			
	Analytical Method:		EPA 200.7				**Analyzed by:**	LM	
Boron	ND	mg/L	0.1	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Calcium	12	mg/L	0.50	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Iron	0.86	mg/L	0.05	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Magnesium	6.2	mg/L	0.50	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Manganese	0.019	mg/L	0.0050	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Potassium	4.8	mg/L	1.0	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Silica (as SiO2)	79.3	mg/L	1.0	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Sodium	8.5	mg/L	1.0	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Zinc	ND	mg/L	0.020	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Metals Analysis by ICPMS	**Prep Method:**		EPA 200.8		**Prep by:**	UK			
	Analytical Method:		EPA 200.8				**Analyzed by:**	SMD	
Arsenic	2.2	ug/L	0.50	1	03/26/12 00:00	MPR 10773	04/02/12 12:32	MMS 6323	
Electrical Conductance Analysis	**Analytical Method:**		EPA 120.1 / SM2510B				**Analyzed by:**	TS	
Conductivity	150	umhos/cm	10	1			03/29/12 13:47	WET 6484	
Anions by Ion Chromatography	**Analytical Method:**		EPA 300.0				**Analyzed by:**	MYS	
Chloride	3.7	mg/L	1	1			03/25/12 13:32	WIC 3540	
Sulfate (as SO4)	0.68	mg/L	0.5	1			03/25/12 13:32	WIC 3540	
Fluoride	ND	mg/L	0.1	1			03/25/12 13:32	WIC 3540	
Nitrate, as NO3	ND	mg/L	2	1			03/25/12 13:32	WIC 3540	
Alkalinity, Total by Standard Methods	**Analytical Method:**		SM20-2320 B				**Analyzed by:**	TS	

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E-MAILED

Thursday, April 12, 2012

Sherry Salinas
McLean and Williams, Inc.
878 El Centro Avenue
Napa, CA 94558

RE: Lab Order: M031038 Collected By: NAHUM
Project ID: 3646 SPRING MT. RD.-VINEYARD PO/Contract #:

Dear Sherry Salinas:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, March 23, 2012. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Enclosures

Project Manager: Patrick J Barnard

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SAMPLE SUMMARY

Lab Order: M031038

Project ID: 3646 SPRING MT. RD.-VINEYARD

Lab ID	Sample ID	Matrix	Date Collected	Date Received
M031038001	WELL HEAD	Water	3/23/2012 14:37	3/23/2012 16:43
M031038002	WELL HEAD	Water	3/23/2012 14:37	3/23/2012 16:45

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NARRATIVE

Lab Order: M031038

Project ID: 3646 SPRING MT. RD.-VINEYARD

General Qualifiers and Notes

Caltest authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that all test results for wastewater and hazardous waste analyses meet all applicable NELAC requirements; all microbiology and drinking water testing meet applicable ELAP requirements, unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 20th Edition except where noted (SMOL=online edition).

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (RL), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Filtrations performed at Caltest for dissolved metals (excluding mercury) and/or pH analysis were not performed within the 15 minute holding time as specified by 40CFR 136.3 table II.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte. An analyte not detected at or above the RL is reported as ND unless otherwise noted or qualified. For analyses pertaining to the State Implementation Plan of the California Toxics Rule, the Caltest Reporting Limit (RL) is equivalent to the Minimum Level (ML). A standard is always run at or below the ML. Where Reporting Limits are elevated due to dilution, the ML calibration criteria has been met.

J - reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

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ANALYTICAL RESULTS

Lab Order: M031038

Project ID 3646 SPRING MT. RD.-VINEYARD

Lab ID: M031038001 Date Collected: 3/23/2012 14:37 Matrix: Water

Sample ID: WELL HEAD Date Received: 3/23/2012 16:43

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
pH, Electrometric Analysis	**Analytical Method:**	SM20-4500-H B					**Analyzed by:** ALO		
pH	6.6	pH Units		1			03/24/12 13:12	BIO 10850	
Total Coliform & E. coli Analysis	**Prep Method:**	ONPG-MUG			**Prep by:** BCP				
	Analytical Method:	ONPG-MUG					**Analyzed by:** MYS		
Total Coliform	ABSENT			1	03/24/12 10:22	BML 7358	03/25/12 10:58	BML 7359	
E. Coli	ABSENT			1	03/24/12 10:22	BML 7358	03/25/12 10:58	BML 7359	
Calculation, Hardness	**Analytical Method:**	Calculation					**Analyzed by:** LM		
Hardness Calculation	58	mg/L	0.5	1			04/02/12 00:00	CALC	
Calculation, Total Anions	**Analytical Method:**	Calculation					**Analyzed by:** TS		
Total Anions	1.6	meq/L		1			04/05/12 15:16	CALC	
Calculation, Total Cations	**Analytical Method:**	Calculation					**Analyzed by:** LM		
Total Cations	1.5	meq/L		1			04/02/12 00:00	CALC	
Metals Analysis by ICP	**Prep Method:**	EPA 200.2			**Prep by:** UK				
	Analytical Method:	EPA 200.7					**Analyzed by:** LM		
Boron	ND	mg/L	0.1	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Calcium	12	mg/L	0.50	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Iron	0.89	mg/L	0.05	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Magnesium	6.5	mg/L	0.50	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Manganese	0.0063	mg/L	0.0050	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Potassium	4.4	mg/L	1.0	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Silica (as SiO2)	76.2	mg/L	1.0	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Sodium	9.1	mg/L	1.0	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Zinc	0.97	mg/L	0.020	1	03/28/12 00:00	MPR 10778	04/02/12 00:00	MIC 3822	
Metals Analysis by ICPMS	**Prep Method:**	EPA 200.8			**Prep by:** UK				
	Analytical Method:	EPA 200.8					**Analyzed by:** SMD		
Arsenic	1.4	ug/L	0.50	1	03/26/12 00:00	MPR 10773	04/01/12 18:12	MMS 6323	
Electrical Conductance Analysis	**Analytical Method:**	EPA 120.1 / SM2510B					**Analyzed by:** TS		
Conductivity	160	umhos/cm	10	1			03/29/12 13:46	WET 6484	
Anions by Ion Chromatography	**Analytical Method:**	EPA 300.0					**Analyzed by:** MYS		
Chloride	3.7	mg/L	1	1			03/25/12 13:49	WIC 3540	
Nitrate, as NO3	2.3	mg/L	2	1			03/25/12 13:49	WIC 3540	
Sulfate (as SO4)	1.4	mg/L	0.5	1			03/25/12 13:49	WIC 3540	
Fluoride	ND	mg/L	0.1	1			03/25/12 13:49	WIC 3540	
Alkalinity, Total by Standard Methods	**Analytical Method:**	SM20-2320 B					**Analyzed by:** TS		

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(707) 258-4000 • Fax: (707) 226-1001 • e-mail: info@caltestlabs.com

NELAP Accreditation 01103CA

Caltest
ANALYTICAL LABORATORY
ENVIRONMENTAL ANALYSES

ELAP Certification 1664

ANALYTICAL RESULTS

Lab Order: M031038

Project ID 3646 SPRING MT. RD.-VINEYARD

Lab ID:	**M031038001**	Date Collected:	3/23/2012 14:37	Matrix:	Water
Sample ID:	**WELL HEAD**	Date Received:	3/23/2012 16:43		

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
Alkalinity, Total (as CACO3)	72	mg/L	10	1			04/05/12 15:16	WTI 2191	
Bicarbonate (as HCO3)	88	mg/L	12	1			04/05/12 15:16	WTI 2191	
Carbonate (as CO3)	ND	mg/L	6.0	1			04/05/12 15:16	WTI 2191	
Hydroxide (as OH)	ND	mg/L	1.7	1			04/05/12 15:16	WTI 2191	

Lab ID:	**M031038002**	Date Collected:	3/23/2012 14:37	Matrix:	Water
Sample ID:	**WELL HEAD**	Date Received:	3/23/2012 16:45		

Parameters	Result	Units	R. L.	DF	Prepared	Batch	Analyzed	Batch	Qual
Metals Analysis by ICPMS	**Prep Method:**		EPA 200.8			**Prep by:** UK			
	Analytical Method:		EPA 200.8				**Analyzed by:** SMD		
Copper	0.52	ug/L	0.50	1	03/30/12 00:00	MPR 10782	04/10/12 10:44	MMS 6328	
Lead	ND	ug/L	0.25	1	03/30/12 00:00	MPR 10782	04/05/12 11:30	MMS 6328	

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The following information is from California Code of Regulations Title 22, Napa County Env. Health "Interpreting Drinking Water Test Results" and UC Davis Department of Land, Air, and Water Resources - Cooperative Extension. This information is provided for your convenience. Caltest does not provide consultation regarding the suitability of water for a given purpose.

Arsenic has a drinking water Maximum Contaminant Level (MCL) of 10 ug/L (ppb) or 0.010 mg/L (ppm)

Boron has an agricultural recommended limit and a state drinking water Action (Advisory) Limit of 1000 ug/L (ppb) or 1 mg/L (ppm). Boron affects the health and production of boron sensitive plants. Drinking water with greater than 10 times the Action Limit Level are recommended for removal from service.

Calcium and **Magnesium** are related to water hardness. See Hardness remarks.

Chloride has a drinking water Maximum Contaminant Level (MCL) of 600 mg/L, with a recommended level of 250 mg/L and a short-term limit of 600 mg/L.

Copper has a drinking water Maximum Contaminant Level (MCL) of 1000 ug/L (ppb) or 1 mg/L (ppm).

Electrical Conductance has a drinking water Maximum Contaminant Level (MCL) of 1,600 umhos/cm, with a recommended level of 900 umhos/cm and a short term limit of 2,200 umhos/cm. Electrical Conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25 degrees C.

Fluoride has a recommended level of 1.0 mg/L in temperate climates. Fluoride in concentrations greater than 3 mg/L can cause dental fluorosis (a brownish discoloration of the teeth).

Iron has a drinking water Maximum Contaminant Level (MCL) of 300 ug/L (ppb) or 0.3 mg/L (ppm).

Hardness is due primarily to calcium and magnesium carbonates and bi-carbonates. Up to 60 mg/L is SOFT. Between 60 to 120 mg/L is MODERATE (typically most desirable). Between 120 to 180 mg/L is HARD. Over 180 mg/L is VERY HARD.

Manganese has a drinking water Maximum Contaminant Level (MCL) of 50 ug/L (ppb) or 0.05 mg/L (ppm).

Sodium has a recommended limit of 100 mg/L. According to the American Heart Association, water containing more than 270 mg/L should not be
consumed by those on a moderately restricted sodium diet.

Nitrate as N, has a drinking water Maximum Contaminant Level (MCL) of 10 mg/L.
Nitrate as NO3 has a drinking water MCL of 45 mg/L.

Lead has a drinking water Action Limit of 15 ug/L (ppb) or 0.015 mg/L (ppm).

pH suggested level is 6.5 - 8.5.

Silica has a recommended limit of 70 mg/L. Silica in water may etch various household materials such as leaded crystal, marble, tile, windows, and porcelain.

Sulfate has a drinking water Maximum Contaminant Level (MCL) of 500 mg/L, with a recommended level of 250 mg/L and a short term limit of 600 mg/L.

Zinc has a drinking water Maximum Contaminant Level (MCL) of 5000 ug/L (ppb) or 5 mg/L (ppm).

Caltest ANALYTICAL LABORATORY

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SAMPLE CHAIN OF CUSTODY

PAGE _____ OF _____

LAB ORDER #: M03/038

PROJECT #/ PROJECT NAME: 3646 SPRING MT RD - VINEYARD WELL

P.O. #:

CLIENT: McLean & Williams Inc

REPORT ATTN: Sherry

ADDRESS: 878 EL CENTRO Ave CITY: NAPA STATE: CA ZIP: 94558

BILLING ADDRESS: SAME

PHONE #: 255-6450 FAX PHONE: 255-6489 SAMPLER (PRINT & SIGN NAME): NATHAN

TURN-AROUND TIME
- ☐ STANDARD
- ☐ RUSH

DUE DATE: _____

ANALYSES REQUESTED: Home 1, Home 2, Home 3 (list all)

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
-1	3/23	234pm	DW	B4		Well Head P		G	
1	1	1	1	QT		1		1	
-2	1	1	1	QT		1		1	Turb = >1
						Need Results 10 days			

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	RELINQUISHED BY	DATE/TIME	RECEIVED BY
	3-23-12 4:45				

Samples: WC ✓ MICRO ✓ BIO ✓ MET ____ SV ____ VOA ____ TEMP: N/A °C SEALED: Y ✓ / N ____ INTACT: Y ✓ / N ____

FOR LAB USE ONLY

BD: BIO ✓ WC ✓ MET ____

CC: AA ____ SV ____ VOA ____

SIL: HP ____ PT ____ QT ____ VOA ____

W/HNO_3 ____ H_2SO_4 ____ NaOH ____

PIL: HNO_3 ____ H_2SO_4 ____ NaOH ____ HCL ____

COMMENTS

MATRIX: W = Aqueous Nondrinking Water, Digested Metals; ML = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL.VOA; OTC = Other Type Container

R ____ PR ____ M ____ F ____

TERMS AND CONDITIONS

I. SCOPE OF SERVICES The following terms and conditions shall apply to all laboratory services performed by Caltest including, but not limited to, those described in Caltest's fee schedule, proposal or other written agreement incorporating these terms and conditions.

II. COMPENSATION Client agrees to pay Caltest for all services performed in accordance with the compensation provisions and analytical fees described in Caltest's fee schedule, proposal or other written agreement with the client. Client agrees to pay Caltest within 30 days after the invoice date. All invoices not paid within such time period will accrue interest at the rate of 1.5% per month or the highest rate allowable by law, whichever is less. Other services provided on a time-and-expense basis will be negotiated and agreed to in writing prior to performance. Client agrees to reimburse Caltest on a time-and-expense basis for all services relating to litigation to which Caltest is not a party and arising from the performance of services.

III. WARRANTY AND LIABILITY Caltest warrants that it shall perform all services in accordance with applicable laws and regulations. All testing and reports shall conform to generally acceptable analytical laboratory principles and practices. Caltest will not be liable for any damages, claims, or expenses, including attorneys' fees, related to the performance of work; save for reimbursing the cost of analyses.

IV. INSURANCE Caltest shall maintain the following minimum insurance: 1. Commercial general liability insurance, including personal injury liability, blanket contractual liability, and broad form property damage liability. The combined single limit for bodily injury and property damage shall be not less than $1,000,000. 2. Automobile bodily injury and property damage liability insurance covering owned, non-owned, rented, and hired cars. The combined single limit for bodily injury and property damage, shall be not less than $1,000,000. 3. Statutory workers compensations and employers' liability insurance. 4. Professional liability insurance.

V. USE OF CALTEST EQUIPMENT Client agrees to pay Caltest for all equipment or other property furnished to client in accordance with the compensation provisions of the fee schedule, proposal or other written agreement. Client agrees to hold Caltest harmless from all damages, claims or expenses arising out of client's use of Caltest's equipment.

VI. TERMINATION OR SUSPENSION OF SERVICES Client may suspend or terminate all or a portion of the services performed by providing Caltest adequate notice. Client shall pay for all costs incurred to the date of such suspension or termination in accordance with the compensation provisions in the fee schedule, proposal or other written agreement. Caltest reserves the right to suspend all services in the event that Client does not pay invoices when due.

VII. ASSIGNMENT These terms and conditions are binding upon Caltest and its Client, their successors, heirs and assigns and may not be assigned by either Caltest or Client without the prior written consent of the other.

VIII. ENTIRE AGREEMENT These terms and conditions and fee schedule, proposal, or other written agreement to which they are incorporated by reference, constitute the entire understanding between Client and Caltest regarding the performance of services. No other agreement, express or implied, shall be of any force or effect except when in writing and signed by both parties.

IX. JURISDICTION These terms and conditions shall be administered and interpreted under the laws of the State of California. If any of these terms and conditions are found to be in conflict with applicable laws, such part will be declared null and void insofar as it is in conflict with said laws and the remainder shall be in full force and effect.

X. TURNAROUND TIME Caltest will process samples in as timely a manner possible. It is recognized that due to workload, equipment failures, Quality Control issues, and other unforeseen reasonable causes turnaround time can vary. Unless specific turnaround times are arranged and documented on the chain of custody, there will be no compensation for extended turnaround time.

Method References In general, the analytical methods Caltest uses adhere closely to those of the EPA or to Standard Methods, 18th Edition. Any deviation from prescribed agency procedures is documented in our Quality Assurance Manual or our Standard Operating Procedures (SOPs). Deviations may be made for a variety of reasons: 1. We may use Quality Control (QC) measures that are more consistent with our overall quality assurance (QA) program or we may add QC measures to satisfy project requirements. 2. We may use a technology more advanced than that specified in the EPA methods. 3. We may add or delete analyses from a particular method to conform to the availability and stability of standards or special needs. Methods for some groups of compounds may change as new MCLs are proposed or new methods specified, or as interferences mandate the use of special cleanup techniques or alternative methods. In addition, Caltest uses a number of special methods developed in house.

Appendix C - Well Completion Report, Irrigation Well

QUADRUPLICATE
For Local Requirements

Page 1 of 1

Owner's Well No. _____

Date Work Began 9-21-99, Ended 9-28-99

Local Permit Agency Napa County Environmental Mgmt.

Permit No. 96-11340 Permit Date 9-17-99

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 777408

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

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD rotary FLUID _____

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	60	gray volcanic rock
60	80	volcanic tuff
80	255	fractured mixed volcanics
255	340	70% clay & 30% shale

RECEIVED
NOV 9 1999
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

TOTAL DEPTH OF BORING 340 (Feet)
TOTAL DEPTH OF COMPLETED WELL 257 (Feet)

WELL OWNER

Name Dennis Fife
Mailing Address 3646 Spring Mountain Rd.
CITY St. Helena STATE CA ZIP 94574

WELL LOCATION

Address same
City _____
County Napa
APN Book 22 Page 150 Parcel 26
Township _____ Range _____ Section _____
Latitude _____ DEG. MIN. SEC. NORTH Longitude _____ DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

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

ACTIVITY (✓)

X NEW WELL
MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)
___ DESTROY *(Describe Procedures and Materials Under "GEOLOGIC LOG")*

PLANNED USES (✓)

WATER SUPPLY
X Domestic ___ Public
X 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 100 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 38 (Ft.) & DATE MEASURED 9-28-99
ESTIMATED YIELD * 30 (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.*

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	25	12								
25	340	9								
0	97		X				PVC F480	6	SDR-21	
97	257			X			PVC F480	6	SDR-21	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	22	X			concrete
22	257			X	pea gravel

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analyses
___ Other _____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

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

NAME HUCKFELDT WELL DRILLING
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

ADDRESS 2110 Penny Lane CITY Napa STATE CA ZIP 94559

Signed _____
WELL DRILLER/AUTHORIZED REPRESENTATIVE

DATE SIGNED 9-29-99

C-57 LICENSE NUMBER 439-746

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

DATE 9-17-99
FEE 119.00
RECEIPT NO. 11865
BY MF
CK. #7068

A.P.# 22-150-26
RECORD # 96-11340

NAPA COUNTY
DEPT. OF ENVIRONMENTAL MANAGEMENT
APPLICATION & PERMIT TO CONSTRUCT A WATER WELL

NAME Dennis Fife (Owner) ADDRESS 3660 Spring Mountain Rd. St. Helena (Job Location)

PHONE # 255-7923

NAME HUCKFELDT WELL DRILLING (Well Driller) ADDRESS 2110 Penny Lane Napa

TYPE OF WORK
New Class I PERMIT X Test Hole Date Called In _____
New Class II PERMIT _____ U.S.G.S. Map Received _____
Well Reconstruction _____ Well Deepening _____ Horizontal Well _____
Well Destruction _____ High Hazard _____ Low Hazard _____ Hand Dug _____

PROPOSED USE
DOMESTIC _____ IRRIGATION X INDUSTRIAL _____ MUNICIPAL _____
TEST WELL _____ HOT WATER _____ (D.O.G. Clearance _____) OTHER _____

Sewage Disposal System (existing or proposed) Public _____ Individual X Private _____
Distance from well to any part of nearest sewage disposal system ~~500'+~~ 300' feet.
Septic System Location Determined By: County File
Plot plan of well location received Yes County road setback _____ ft. from centerline.

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

****

TERMS OF PERMIT

1) Call at least 24 hours in advance to schedule an inspection.
2) Prior to receiving a Final Clearance on the well, a copy of the Department of Water Resources "Water Well Drillers Report" (DWR-188) must be returned to our Department.

Old Wells to be Destroyed: _____
Other Remarks: _____

Dan Huckfeldt
Signature of Applicant

Sept. 17, 1999
Date

****

OK gwo TC 9/17/99

FOR OFFICE USE ONLY

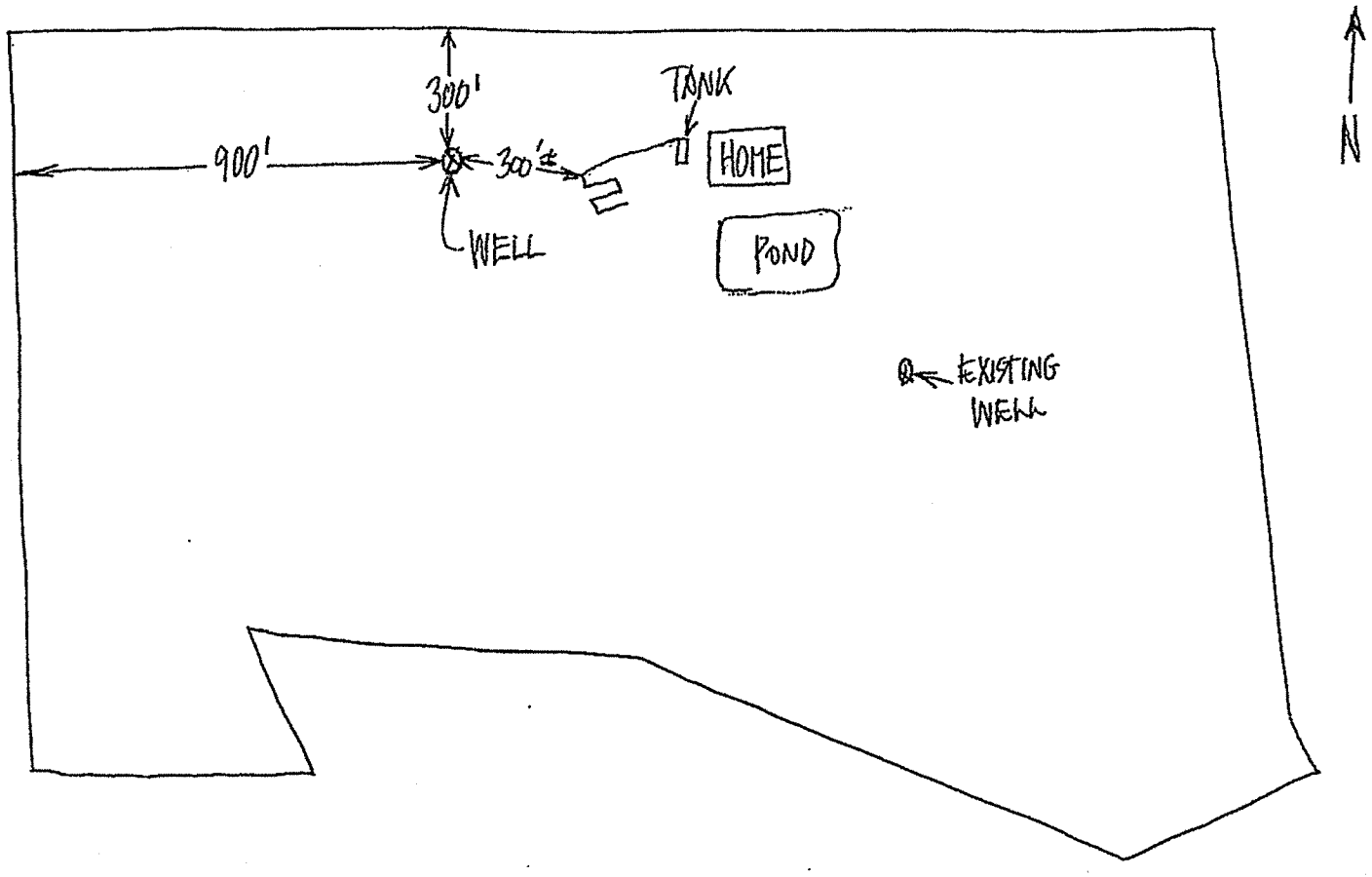
	Date	By	Remarks
City Clearance			
Pub. Works Clearance			
Pre-Inspection			
Class II Approval			
Permit Issued	9-21-99	R. Cira	
Const. Insp.	9/27/99	JS	6" casing, 12 3/4" bore, Sealed to 22'
Well Log Rec.	11/9/99	JKP	
Final Insp.			

White-Office Yellow-Owner Pink-Contractor

HUCKFELDT
WELL DRILLING

DENNIS FIFE
3660 SPRING MTN ROAD
ST. HELENA, CA
AP # 22-150-26

RECEIVED
SEP 21 1999
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT



2110 PENNY LANE • NAPA, CALIFORNIA 94559 • 707-255-7923 • FAX 252-4651

CAL CODE
WATER SYSTEM INFORMATION

FOR THE

3646 SMR VINEYARD WINERY

LOCATED AT:
3646 Spring Mountain Road
St. Helena, CA 94574
NAPA COUNTY APN 022-150-026

PREPARED FOR:
3646 SMR Vineyard LLC
Care of: Andrew Rudd
2175 North California Boulevard, Suite 400
Walnut Creek, CA 94596
Telephone: (925) 788-5671

PREPARED BY:

APPLIED
CIVIL ENGINEERING
INCORPORATED

2074 West Lincoln Avenue
Napa, California 94558
Telephone: (707) 320-4968
www.appliedcivil.com

Job Number: 13-143

Michael R. Muelrath — 1/15/2015

Michael R. Muelrath R.C.E. 67435 — Date

TABLE OF CONTENTS

LIST OF APPENDICES

INTRODUCTION

3646 SMR Vineyard LLC is applying for a Use Permit to construct and operate a new winery at their property located at 3646 Spring Mountain Road in Napa County, California. The subject property, known as Napa County Assessor's Parcel Number 022-150-026, is located off of a private shared driveway, approximately 0.5 miles north of Spring Mountain Road.

The Use Permit application under consideration proposes the construction and operation of a new winery with the following characteristics:

- Wine Production:
  - 20,000 gallons of wine per year
  - Crushing, fermenting, aging and bottling

- Employees:
  - 2 full time employees
  - 2 part time employees (regular)
  - 2 part time employees (seasonal)

- Marketing Plan:
  - Daily Tours and Tastings by Appointment
    - 12 visitors per day maximum
    - 65 visitors per week maximum
  - Food and Wine Pairings with Meals
    - 24 per year maximum, no more than 4 in any month
    - 12 events with up to 20 guests maximum
    - 12 events with up to 12 guests maximum
    - Food prepared in onsite kitchen
  - Wine Club / Release Events with Meals
    - 2 per year maximum
    - 50 guest maximum
    - Food prepared offsite by catering company
  - Larger Auction Related Event
    - 1 per year
    - 100 guests maximum
    - Food prepared offsite by catering company
    - Portable toilets brought in for guest use

Existing structures on the property include a single family residence, vineyard, a pond and the related access and utility infrastructure to support these uses. Please see the 3646 SMR Vineyard Winery Use Permit Conceptual Site Plan for approximate locations.

Since the number of employees plus the number of visitors plus the number of residential water users is not expected to exceed 24 for 60 or more days out of the year, the project will be not be required to implement a Transient Non-Community Public Water System. However, since there is a commercial kitchen that will be used to prepare food for winery guest the winery will be required to have a Cal Code water system.

3646 SMR Vineyard LLC has requested that Applied Civil Engineering Incorporated (ACE) prepare a brief report outlining the anticipated technical, managerial and financial aspects of the Cal Code water system that will be required to serve the proposed winery to accompany the winery Use Permit application as required by Napa County.

WATER SYSTEM NAME

The water system will be known as the "3646 SMR Vineyard Winery Water System".

NAME OF PERSON WHO PREPARED THIS REPORT

This report was prepared by Michael Muelrath, PE of Applied Civil Engineering Incorporated. Information regarding the parameters of the subject Use Permit application and water quality testing results were provided by 3646 SMR Vineyard LLC.

TECHNICAL CAPACITY

System Description

Water for domestic uses is currently provided by the existing "House" well. According to the report by McLean and Williams the well is 171 feet deep and produced 6 gallons per minute with 56 feet of drawdown when tested in March of 2012. Water is pumped directly from the well to the point of use at the existing residence. There is a pressure tank system installed to help maintain steady pressure at the residence and minimize the cycling of the well pump.

Water Demand Projection

We have used the Napa County Phase I Water Availability Analysis Estimated Water Use Guidelines to estimate the annual water demand for the existing residence and vineyard as well as the associated garden and landscaping to be approximately 5.20 acre-feet per year. The proposed winery and associated landscaping water use and an allowance for future vineyard expansion within the already approved footprint is estimated to be an additional 2.04 acre-feet per year for a total proposed groundwater use of 7.24 acre-feet per year. This estimated water use is well below the Phase I Water Availability threshold for this parcel (28.3 acre-feet/year). The total proposed domestic demand is estimated to be 1.29 acre-feet per year. It is planned that the existing "House" well will be used for domestic purposes and that the existing "Irrigation" well will be used for vineyard and landscape irrigation needs.

Using the projected annual domestic water demand of 1.29 acre-feet per year, we have calculated an average daily demand of approximately 1,152 gallons and a maximum daily demand (MDD) of approximately 2,591 gallons (calculated using a peaking factor of 2.25 per California Waterworks Standards Section 64554b.3.(C)).

Source Adequacy

The source for a Cal Code water system is not required to have a 50 foot deep, 3 inch wide concrete annular seal as is required for Transient and Non-Transient Non-Community water systems.

Water Supply Capacity

Assuming a conservative well pumping cycle of 12 hours per day the new well must be capable of producing at least 3.6 gallons per minute to meet the water system's domestic MDD. The yield of the well was tested by McLean and Williams on March 28, 2012 and the yield is estimated to be 6 gallons per minute which is nearly double the yield needed to meet the MDD.

Futhermore, it should be noted that there is also another well on the property that could be used to supply the domestic water to the winery and residence if needed (the other well is referred to as the "Irrigation" well).

We recommend that the water level, yield and drawdown in the well be monitored on an ongoing basis to detect any trends in changing water table levels and well yield so that adjustments to usage patterns and alternate sources can be developed if needed.

Water Quality Characterization

Water quality testing was performed in April of 2012. Results indicate that the water should be generally acceptable for the intended use. The owner may opt to install treatment to enhance water quality but none is required to meet Cal Code water system requirements. Most importantly, bacteriological testing for Total Coliform and E. Coli indicated the absence of bacteria.

Consolidation Analysis

The subject parcel does not fall within the service area of a known existing public water system and thus consolidation is not feasible.

MANAGERIAL

Organization

Management and routine operation of the water system will be performed by the winery staff. One staff member will be responsible for performing sampling, reporting and keeping up to date records onsite in accordance with Napa County requirements. The winery staff person in charge of the water system will consult with water system specialists as needed if issues arise with any components of the water system.

Land Ownership

The existing well is located on the same property as the proposed winery. This property is owned by 3646 SMR Vineyard LLC. Since the well and all water system components are planned to be located on the winery property, no access or maintenance easements will be required.

Water Rights

The 3646 SMR Vineyard Winery Water System will use groundwater from a non-adjudicated groundwater basin exclusively and is therefore not subject to water rights through the State Water Resources Control Board.

FINANCIAL

There will be no revenue generated by the water system.

The expected expenses for the water system can be broken down into initial startup cost and ongoing operational cost as shown below.

Startup Cost

Startup cost should be minimal since existing infrastructure will be utilized.

Actual costs will be dependent upon the level of water purification selected and could run in the range of $5,000 to $25,000 depending on final design parameters.

Annual Operating Cost

Annual operating cost for the water system will include a portion of one employee's salary, cost for performing water quality testing, equipment maintenance and replacement, replacement of consumable items and electrical service charges. The actual cost to operate and maintain the water system will be dependent on the final design of the water system. We estimate that the annual cost associated with operating and maintaining the water system will be in the range of $2,000 to $3,000 per year depending on final water system design.

Funding

The startup cost will be financed along with the construction of the winery. The winery's annual budget must include a line item for water system operation and maintenance expenses to ensure finances are available to operate and maintain the water system throughout the life of the winery.