WESTERN GROUNDWATER
SURVEYORS, INC.

December 27, 2021

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4379 & 4457 New Long Valley Road
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RE: HYDROLOGY REPORT FOR LAKE COUNTY CALIFORNIA ORDINANCE NO. 3106 FOR PROPOSED CANNABIS CULTIVATION ON 4379 and 4457 NEW LONG VALLEY ROAD, CLEARLAKE OAKS, LAKE COUNTY, CALIFORINA

This hydrology report presents the results of a groundwater availability study conducted for the property located at 4379 & 4457 New Long Valley Road, Clearlake Oaks, Lake County, California (see Appendix A, Figure 1 Vicinity Map for site location). The study was conducted to comply with the requirements of Ordinance 3106 County of Lake, State of California.

Ordinance No. 3106 is an urgency ordinance requiring land use applicants to provide enhanced water analysis during a declared drought emergency. The Ordinance requires that any land use approvals are required to provide adequate information regarding water usage for the project being considered and its impacts to surrounding areas. All projects that require a CEQA analysis of water must address the items listed in Section one subsections A and B of the Ordinance. This report was prepared to meet the objectives of Ordinance 3106.

1.0 BACKGROUND INFORMATION

1.1 Site Description

The existing property consists of one 30.85-acre parcel with APN 006-009-53 and one 68.41-acre parcel with APN 006-009-23 located in Township 14N Range 7W sections 06 and 07 Mount Diablo Base Meridian. See Figure 1 Vicinity Map in Appendix A for the location of the project site. See Figure 2 Site Map in Appendix A for the site map of the property showing existing features. As shown on Figure 2, the property is not currently developed and is characterized by flat grassland and hilly terrain with trees. Property elevations range from approximately 1,308 to 1,889 feet above mean sea level (MSL).

For the purpose of this report APN 006-009-53 and the portion of APN 006-009-23 withing Long Valley are referred herein as the project site. The remaining portion of APN 006-009-23, south of Long Valley, is not addressed as part of the project site.

The topography of the project site is flat grassland with a one percent slope towards the north and Long Valley Creek. Elevation of the project site is from 1,310 feet MSL to 1,308 feet MSL. The southern edge of the project site is bounded by a tributary to Long Valley Creek and the northern edge is bounded by Long Valley Creek.

The areas surrounding the project site consist of rural residential, agricultural, and undeveloped land. The property to the west of the project site is an active vineyard and hay fields, rural residential properties boarder the north and northeast of the project site, and undeveloped land with thick stands of trees boarder the project site to the east.

1.2 Proposed Development

The proposed development is for 4 acres (174,240 square feet) of canopy for mixed light or full sun outdoor cannabis cultivation in above ground wooden planting beds or cloth pots with a drip irrigation system. Proposed ancillary facilities include a 120 square foot pesticide and fertilizer storage shed, a 120 square foot ADA compliant restroom, a 120 square foot security shed, two 120 square feet storage sheds, and six 2,500-gallon water storage tanks.

Water supply for the proposed development will be via the onsite water supply well that is located within the project site. The well was installed in June 2014, completed to a depth of 54 feet fellow ground surface (BGS) with a 21-foot sanitary seal. A well test was completed in September 2021 which determined a pumping rate of 100 GPM over a 4-hour period.

1.3 Local Hydrogeology

A USGS Geologic map, *Framework Geologic Map and Structure Sections along the Bartlett Springs Fault Zone and Adjacent Area from Round Valley to Wilbur Springs, Northern Coast Ranges, California* (McLaughlin et al, 2018), indicates that the project site and cumulative impact area (CIA - defined in Section 3.0) is underlain principally by older alluvial fan deposits and surfaces (Pleistocene - Qfo) and alluvial terrace deposits (Holocene and Pleistocene - Qt). Both are underlain by metasandstone and argillite, locally conglomeratic (Upper and Lower Cretaceous, Cenomanian to Aptian, to Late Jurassic, Tithonian deposits - fys). The geology observed during the site visit by Western Groundwater Surveyors (WGS) was consistent with the USGS geologic map. Please refer to Figures 3 and 4 in Appendix A for a geologic map and cross section of the CIA.

The project site's CIA (defined in Section 3.0) is underlain principally by Qfo: older alluvial fan deposits and surfaces (Pleistocene) and Qt: alluvial terrace deposits (Holocene and Pleistocene) and represents the primary aquifer system for the project site and the CIA.

The well on the project site is completed in Qt (Pleistocene) alluvial terrace deposits. Rock descriptions provided in the corresponding well completion report (WCR) include layered sand/gravel and clay deposits. The static groundwater level at the

time of drilling was 18-feet BGS. Recent depth to static groundwater levels were measured on September 22, 2021 (Well Test Report) indicating a static groundwater level of 29 feet BGS.

The most prominent surface water features in proximity to the project site are Long Valley Creek to the north and an unnamed tributary to Long Valley Creek to the south of the project site.

1.4 Local Climate

Most precipitation occurs during the five-month period from November through March with a dry summer period from June through September. The longest record of climate data in the general area is from Lakeport. The mean annual precipitation for Lakeport during the period 1971 through 2020 is 37.67 inches. *USGS National Water Information System: Web Interface for Lakeport annual precipitation. (https://www.usgs.gov/ca/nwis) Accessed 12-16-2021.*

The mean annual potential evapotranspiration (ETo) for Lake County is estimated to be approximately 49.4 inches per year based on a 1999 Reference Evapotranspiration (ETo) Map prepared by the California Irrigation Management Information System (CIMIS). (https://cimis.water.ca.gov/App_Themes/images/etozonemap.jpg).

2.0 RESEARCH

The following subsections provide a summary of the scope of research performed and the corresponding findings used in this hydrology report. The scope of the research was developed to complete a hydrologic analysis addressing the requirements of Lake County Ordinance 3106.

2.1 Site Reconnaissance

Western Groundwater Surveyors, Inc. (WGS) performed a site reconnaissance of the property on November 18, 2021. The purpose of the site reconnaissance was to observe existing site features, site topography, local geology, land uses, on-site and off-site water wells, etc. At the time of the site reconnaissance, the existing on-site features and geology were generally consistent with those described in Subsection 1.1 (Site Description) and Subsection 1.3 (Local Hydrology) of this report. The property is characterized by a combination of open areas covered with seasonal grasses and hilly terrain covered with trees.

Observation of Long Valley Creek (northwest to southeast of project site) revealed the presence of slow-moving surface water in parts of the channel, standing pools of water in parts of the channel, and no surface water in other parts of the channel.

The reconnaissance also encompassed the observance of neighboring properties to

establish the nature of nearby developments and property uses. Due to the nature of the rural area and limited public access, visual observations were limited to what could be seen from the property line or at a distance from New Long Valley Road. The properties in all directions from the project site were comprised of rural properties with single family dwellings, ranching, and agriculture such as vineyards, walnut groves, and hay fields. One off-site water well was visually identified within the CIA and is located to the west of the project site. A second off-site water well within the CIA is assumed to be located within the parcel to the northwest of the project site. Several other water wells were visually identified that are not within the CIA but are located on the site map. See Figure 2 Site Map in Appendix A for the well locations.

The site reconnaissance was supplemented with review of Google Earth Pro aerial imagery for the area and Lake County Parcel Viewer to assess the use and zoning of all parcels located within or near the CIA.

2.2 Water Well Drillers Reports (WWDRs) or Well Completion reports (WCRs)

WWDRs or WCRs maintained by the California Department of Water Resources (CDWR) were reviewed to obtain pertinent information for the area regarding water supply use, well completion depths, yields, etc. The scope of the CDWR research encompassed available records for wells located with Sections 05 - 08 of Township 14N Range 7W and Sections 01 and 12 of T14N R8W. Mount Diablo Baseline Meridian. The off-site search radius was set to approximately 1.0 mile from the well on the project site as a means of obtaining available information representative of the local hydrogeologic conditions. The results of this research identified two WCRs and one WWDR for wells within the CIA; WCR No. 0951442 corresponds to the well located on the project site, and WCR2018-003486 and WWDR No. 349823 correspond to the two off-site wells located within the CIA. The following breakdown provides a summary of the well and water supply characteristics for both the on-site and off-site wells in the CIA as described in the WWDRs or WCRs.

Table 1: Results from Well Research within the CIA

Description	On-site	Off-site
Number of Water Supply Wells	1	2
Number of Dry Boreholes	0	0
Drilling Depths (feet BGS)	54	40 - 135
Static Groundwater Levels (feet BGS)	18 (recent well test 30)	30
Reported Yields (GPM)	50 (recent well test 100)	40 - 1,000
Specific Capacity (GPM/ft)	100 GPM/ft	5 GPM/ft and N/A

BGS:	Below Ground Surface	GPM:	Gallons per minute
GPM/ft:	Gallons per Minute per Foot of Drawdown	N/A:	Not Available.

Please note that the breakdowns provided in Table 1 should be considered estimates based on interpretation of the WCR or WWDR information. Please refer to Appendix B for copies of the WCRs or WWDRs for the on- and off-site wells.

As shown in Table 1, the reported well yields for the on-site and off-site water wells range from 40 to 1,000 GPM. The average values based on the data set equates to approximately 363 GPM. It should be noted that the reported yields presented above correspond to those derived from air lift/pumping performed at the time of drilling.

2.3 Assessor's Parcel Maps

County assessor's parcel maps for the area were reviewed to assist in identifying neighboring parcel boundaries and addresses. This information was used to establish the number of parcels within the cumulative impact area (described in Section 3.0) for this study. Twelve parcels were identified within the cumulative impact area ranging in size from approximately 26 to 180 acres. Of the twelve parcels, well information was identified for one on-site well and one off-site well identified within the cumulative impact area as determined from the WCR or WWDR.

2.4 Zoning Information

Zoning designation was reviewed for neighboring properties within the designated cumulative impact area (discussed in Section 3.0) using the Lake County Parcel Viewer to evaluate current and potential future uses and implications of the proposed project on future groundwater use in the area. Findings from this research revealed that the project site itself is zoned RL-FF-WW-B5 (5ac) for APN 006-009-53 and RL-WW-B5 (5ac) for APN 006-009-23. The properties to the west, northwest, and east of the project site are zoned APZ-WW, RL-WW-B5 (5 ac), RL-FF-WW-B5 (5 ac), and APZ-FF-WW.

A Guide to Zoning Districts, County of Lake Community Development Department Planning Division (2006) defines the zoning designations as follows:

RL (Rural Lands) Allows agricultural uses and single-family dwellings. Allowable density of one dwelling per 20 – 65 acres. Steep slopes, fire hazard, and remoteness often restrict development.

FF (Floodway Fringe) Provides standards to protect structures from flood hazards within areas subject to 100-year flooding.
WW (Waterway) Protects creeks and riparian habitat.

A & APZ (Agriculture & Agricultural Preserve) Allows all agricultural uses, including one dwelling, processing (wineries, packing sheds, etc.), and labor quarters. Minimum lot size typically 40 acres. "APZ" land is subject to Williamson Act Agricultural Preserve contract, and land divisions are discouraged.

The current and proposed land uses are consistent with the land zoning and it would be reasonable to assume that future land use would be consistent with current land use. Implying that future water use may be consistent with current water use.

2.5 Well Yield Tests

A well yield test was conducted for the project sites well on September 22, 2021 that revealed a sustainable pumping rate of approximately 100 GPM over four hours. Static groundwater level in the well as measured prior to the pump test was at 30 feet BGS and after four hours of pumping was at 29 feet BGS. See Appendix B for a copy of the well test.

3.0 CUMULATIVE IMPACT AREA (CIA)

The definition of "cumulative impact area" corresponds to the change in a specific area resulting from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable proposed future projects. Based on this criterion, existing and proposed future site development characteristics and zoning designations for surrounding properties were considered, coupled with the site hydrogeology and the nature of the proposed development, to estimate the cumulative impact area for the proposed project.

The project site is located along Long Valley Creek. Based on this proximity, the northern boundary of the CIA for the project is aligned with Long Valley Creek and the southern boundary is aligned with the unnamed tributary to Long Valley Creek that flows along the boundary between the mountains and valley floor. The CIA encompasses all of the Qfo and Qt deposits, up Long Valley Creek for 1.14 miles, and the CIA ends 0.62 miles downstream where Long Valley Creek and the unnamed tributary to Long Valley Creek converge.

The boundary of the CIA is illustrated on Figure 2 (Appendix A). As shown on Figure 2, at its widest point, the CIA is approximately 1.05 miles wide and reduces in width in the southern direction to approximately 0.17 miles wide where the two creeks converge. The northwestern and southwestern boundary of the CIA was set to include all of the Qfo deposit. The overall size of the CIA is approximately 569 acres and encompasses twelve properties (including the project site).

The CIA defined above includes quaternary alluvial fan deposits and surfaces (Qfo – Pleistocene) and quaternary alluvial terrace deposits (Qt – Holocene and Pleistocene). A review

of the geologic map for the area (see Figure 3, Appendix A) and the available WWDRs or WCRs indicate that the Qfo deposit, represents the principal water-bearing formation for approximately 70 percent (395 acres) of the CIA.

4.0 GROUNDWATER AVAILABILITY ANALYSIS

The following subsections provide a discussion on the groundwater availability conditions at the project site. This assessment was performed to address the requirements of Lake County Ordinance No. 3106 and includes discussions of existing and projected groundwater use, aquifer storage, a water budget analysis, drawdown and well interference characteristics, and a groundwater/surface water assessment.

4.1 Summary of Existing / Projected Groundwater Use

Table 2 provides a general synopsis of both the existing and projected groundwater uses associated with the proposed development, as well as estimates of the off-site groundwater use on adjoining and nearby properties located within the CIA. For the purpose of this report, the project site groundwater use corresponds to the portion of the project parcels within Long Valley. There is currently no existing groundwater use at the project site. The future project site groundwater use corresponds to cannabis operations and facilities for full-time employees. Cannabis operations water use is based on estimates provided in the farm management plan, *Property Management Plan (for 4379 & 4457 New Long Valley Road)*. Estimates for wastewater generation for facilities for full-time employees were estimated at 15 gallons of water per person per day(https://www.energy.gov).

For estimating the remaining off-site groundwater use demands within the CIA, WGS utilized industry standard values for the various types of operations and uses. The water use analysis assumed industry standard values for water use based on the number of bedrooms per parcel.

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Description	Existing (AF/yr)	Proposed (AF/yr)	Total (AF/yr)
Project Site Groundwater Use			
Cannabis Operations	0	7.84	7.84
Employee (4 – 6) facilities	0	0.08	0.08
Project Site Totals	**0**	**7.92**	**7.92**
Off-Site Groundwater Use			
Single Family Dwellings – Domestic Use *(1)*	0.8	0	0.8
Single Family Dwellings – Incidental Use *(2)*	0.25	0	0.25
Vineyard Irrigation *(3)*	136.5	0	136.5
Walnut Orchard *(4)*	65.5	0	65.5
Off-Site Totals	**203.1**	**7.92**	**203.1**
Combined Groundwater Use			
Combined Totals	**203.1**	**7.92**	**211**

AF/yr = Acre feet per year

The following provides a breakdown of the estimated groundwater extraction sources and volumes:
(1): Based on unit usage rate of 0.16 AF/yr per bedroom (Lake County Water Demand Forecast 2006)
(2): Based on unit usage rate of 0.25 AF/yr per dwelling unit. Incidental uses may include landscaping, pool, and/or second unit.
(3): Based on unit usage rate of 0.78 AF/yr per AC of vineyard (Lake County Water Demand Forecast 2006)
(4): Based on unit usage rate of 3.56 AF/yr per AC of Walnuts (Lake County Water Demand Forecast 2006)

4.2 Groundwater Storage Capacity or Aquifer Storage

The storage capacity of the aquifer within the CIA was estimated by multiplying the volume of the aquifer by its specific yield. The volume of the aquifer was calculated by multiplying the aquifer area by the average thickness. The area of the aquifer is equal to the area of the CIA. The bottom of the aquifer is defined as the contact between the younger, unconsolidated terrace and alluvial deposits over bedrock. The average thickness of the aquifer was estimated using geologic cross sections (Figure 4). Given that the entire CIA is underlain by terrace deposits and alluvium, the aquifer properties are expected to be the similar throughout the entirety of the aquifer (569 AC). Finally, the aquifer's specific yield or volume was assigned a value of 20 percent specific yield characteristics published in (Driscoll, F.G., 1986, *Groundwater and Wells).* Using this information, the volume of groundwater in storage was calculated by multiplying the respective variables.

The following provides a breakdown of the calculation:

Aquifer Area:	569 AC
Average Static water level:	24 feet BGS
Average Thickness:	95 feet BGS
Thickness of saturated aquifer:	71 feet
Specific Yield:	20 percent
Calculated Volume of Water in Storage:	8,080 acre-feet (AF)

As required by Lake County Ordinance No. 3106, the approximate amount of water available for the project's identified water source is 8,080 AF. As presented in Subsection 4.1 (Summary of Existing / Projected Groundwater Use), the additional groundwater supply requirement for the proposed future development is 7.92 AF/yr. Represents a negligible amount of the groundwater in storage within the CIA (0.1%). Similarly, when considering the projected existing and proposed groundwater supply demand within the CIA (211 AF/yr), the corresponding water use equates to approximately 2.6 percent of the total volume of groundwater in storage.

4.3 Water Budget Analysis

The CIA was evaluated to determine the amount of groundwater potentially available for recharge versus the current groundwater use within the CIA. The groundwater recharge estimate was calculated by assuming that precipitation on the CIA (aerial recharge) represents the primary source of potential inflow into the underlying aquifer, and run-off and evapotranspiration represent the primary outflow variables. Secondary sources of inflow (e.g., groundwater inflow from upgradient boundaries, recharge from irrigation, etc.) and outflow (e.g., groundwater outflow along downgradient boundaries, etc.) can contribute to the

overall groundwater recharge characteristics. Based on the hydrology of the CIA these secondary sources were assumed to be relatively equal, resulting in no net gain or loss. The following equation was used to calculate potential groundwater recharge:

Potential Groundwater Recharge = $P – (R + Et_a + S)$

Where "P" is equal to precipitation (in AF/yr), "R" is equal to run-off (in AF/yr), "Eta" is equal to actual evapotranspiration (in AF/yr), "S" is equal to spring flow (in AF/yr). Details regarding the calculation of each of these variables are presented below.

Precipitation (P)
The total volume of precipitation that falls within the CIA was calculated by multiplying the average annual precipitation rate (37.68 inches per year) by the size of the applicable CIA (569 AC).

Run-off (RO)
The percentage of the total annual 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 (CA SWRCB 2011). In general, slope surfaces were separated by areas identified as "flat" (less than two percent), "rolling" (two to ten percent), and "hilly" (greater than ten percent). In this regard, the relative percentages of slopes within the CIA that align with these categories are approximately 1.0, 2.9, and 7.3 percent, respectively. Less than one percent of the area corresponds to surface water reservoirs (1.5 AC). These areas, in turn, were further separated by the types of settings. The following provides a breakdown of the setting types and range of RCs used in the analysis:

Meadows / Pasture Land:	323 AC (RC = 0.15 – 0.45) = 304.3 AF
Light Residential:	16 AC (RC = 0.40 to 0.45) = 9.9 AF
Woodland / Forest:	30 AC (RC = 0.05 – 0.25) = 7.6 AF
Cultivated Land:	200 AC (RC = 0.20 – 0.50) = 73.1 AF

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. The summation of all the area run-off volumes equates to the total annual run-off volume for the entire cumulative impact area. An additional 273 Acres of woodlands adjacent to the CIA has runoff that does not flow to Long Valley Creek. The runoff from the 273 acres of woodlands flows directly onto vineyard or pasture/grassland within the CIA. The runoff from the 273 acres of woodlands contributes an additional 139.3 AF/yr of recharge within the CIA.

Actual Evapotranspiration (ET_a)
Site-specific evapotranspiration data for the project site is not available. In the absence of such information, an ETa conversion factor based on a United States Geological Survey (USGS) study conducted for the Alexander Valley region (Metzger et. al., 2006) was employed to generate an ETa for the water budget analysis. The purpose of the conversion factor is to account for periods when soil moisture is below field capacity and plants are in dormancy. Using this approach, the estimated unit ETa was calculated by multiplying the mean annual ETo (49.4 inches per year) by the USGS conversion factor of 0.33. The corresponding total ETa was then calculated by multiplying the unit ETa value (16.3 inches per year) by the applicable CIA acreage (569 AC).

Springs
No springs were identified withing the CIA during the field investigation or identified on USGS topo maps for the area. As a result, spring flow values in the water budget are zero.

The results of the water budget calculations using the aforementioned parameters Are presented in Table 3.

Table 3
Summary of Annual Water Budget Calculations

Description	Average (AF/yr)
Precipitation (inflow)	+ 1926
Run-Off (outflow)	- 395
Actual Evapotranspiration (outflow)	- 774
Spring Flow	0
Potential Groundwater Recharge	**+ 757**

Using each of the calculated values in the "Groundwater Recharge Potential" equation, the corresponding estimated volume of water potentially available for groundwater recharge from direct precipitation is approximately 757 AF/yr. The project's groundwater supply requirement of 7.92 AF/yr equates to 1.0 percent of the potential groundwater recharge volume.

Comparison of the estimated volume of water potentially available for groundwater Recharge (757 AF) during average rainfall years to the combined estimated existing groundwater use (203.1 AF) for the CIA indicates a residual positive water balance of 554 AF/yr, thereby indicating that the proposed project plans are reasonable from a groundwater use perspective. Furthermore, the water demands for the existing

(203.1 AF) and future potential development scenarios (211 AF) within the CIA equate to 28 percent of the potential groundwater recharge volume for a historical average rainfall year. While a number of estimates or assumptions are factored into the analysis, the percentage of water demand versus the potential groundwater recharge volume provides an appreciable factor of safety to compensate for any variables that might deviate from said estimates and/or assumptions.

In addition to the aforementioned analysis that is based on an average rainfall year, a separate analysis was performed simulating drought conditions. To accomplish this, WGS assumed a total annual rainfall equal to 60 percent of the average annual rainfall (22.6 inches per year). The precipitation, run-off, actual evapotranspiration, and spring variables in the potential groundwater recharge equation presented in the previous subsection were adjusted accordingly. The results of this exercise revealed a decrease in the potential groundwater recharge volume from 757 AF/yr to 454 AF/yr, thereby indicating that a positive water balance would still remain under drought conditions. However, the percentage of the water demands for the existing and future potential development scenarios within the CIA increases to approximately 46 percent of the potential groundwater recharge volume during drought conditions.

4.4 Drawdown Characteristics

Projected drawdown characteristics associated with the proposed project were estimated through the performance of a preliminary analysis using WCR data and data from the Well Test Report. As previously noted, there is an existing water supply well at the project site location. Based on the well test completed in September 2021, the well experienced one-foot of drawdown with a sustained 100 GPM discharge during a four-hour test.

Projected groundwater pumping from the existing well on the proposed project site is intended to provide a general insight into potential nearby well and surface3 water interference. Provided is a summary of the various parameters considered in the analysis and the corresponding results.

Daily Water Demand

In accordance with the estimates outlined earlier, the projected annual groundwater use for the project site is 7.84 AF/year with an additional 0.08 AF/y being attributed to the incidental (bathroom) use for full-time workers. This equates to a daily water demand of approximately 7,070 gallons per day (GPD).

Pumping Rate and Duration

Whereas the water demand would likely occur intermittently throughout the

day, the total volume was assumed to be pumped over a 4-hour period, a conservative measure to induce the maximum potential drawdown characteristics. According to the groundwater use estimates for the project, the maximum daily demand (MDD) will be 19,147 gallons for the scenario pertaining to a given day in August, which includes water uses associated with cannabis operations and facilities for full-time employees. Conversely, the MDD during the winter will be 920 GPD. For the purpose of this analysis, it is assumed that the MDD is drawn from the well over a 4-hour pumping period. In this scenario the well will be pumped at a rate of 80 GPM to provide the MDD in August.

Well Interference Characteristics

There are three wells within the CIA that have associated WCR's (see appendix B). For the purpose of evaluating well interference the following WCR's were used. Existing well (WCR No. 0951442) on the proposed project site and the nearest off-sit well (WCR2018-003486) within the CIA. WCR's for the existing well on the project site and the nearest off-site well within the CIA do not include drawdown values. However, a recent well test was performed on the existing well on the proposed project site in September of 2021 by Jim's Pumps of Upper Lake (CA#993066). The results of the well test show a drawdown of only 1 foot over 4 hours with a sustained discharge of 100 GPM. At the completion of the well test the recovery time of the well was measured. Recovery time of a well is the amount of time it takes the drawn down water level in the well to recover to the static level at the start of the test. In this well test the recovery time was 15 minutes.

The closest off-site well is located approximately 1,400 feet to the east of the existing well on the proposed project site.

As discussed in the above section (Pumping Rate and Duration) an assumed pumping rate of 80GPM for a period of 4 hours will meet the MDD of the proposed project. This pumping rate would produce an expected drawdown in the project site well of less than 1 foot.

Taking into consideration the well characteristics and the distance from the existing well on the proposed project site to the nearest off-site well, there is minimal potential for off-site well interference as pertaining to the operation of the proposed project site well. Therefore, it is reasonable to conclude that the potential for off-site well interference associated with the project sites groundwater demands is low.

4.5 Groundwater / Surface Water Assessment

As noted in Subsection 1.3 (*Local Hydrogeology*), the primary surface water

features in the area corresponds to Long Valley Creek, which borders the northern margin of the project site and an unnamed tributary to Long Valley Creek that borders the southern margin of the project site. The minimum separation between the well and Long Valley Creek is approximately 1,000 feet, providing an appreciable setback. And the minimum separation between the well and the unnamed tributary to the south of the project site is approximately 435 feet, also providing an appreciable setback.

A recent well test was performed on the existing well on the proposed project site in September of 2021 by Jim's Pumps of Upper Lake (CA#993066). The results of the well test show a drawdown of only 1 foot over 4 hours with a sustained discharge of 100 GPM. At the completion of the well test the recovery time of the well was measured. Recovery time of a well is the amount of time it takes the draw down water level in the well to recover to the static level at the start of the test. In this well test the recovery time was 15 minutes.

As discussed in section 4.4 (Pumping Rate and Duration) an assumed pumping rate of 80GPM for a period of 4 hours will meet the MDD of the proposed project. This pumping rate would produce an expected drawdown in the project site well of less than 1 foot.

Therefore, when taking into consideration the proposed project sites well characteristics and the distance from the well to the nearest surface water, there is minimal potential of surface water interference as pertaining to the operation of the proposed project site well. Therefore, it is reasonable to conclude that the potential for surface water interference associated with the project sites groundwater demands is low.

5.0 CONCLUSIONS

Based on the proposed water use and the estimates presented herein, it does not appear that the proposed project will have a significant impact on groundwater or surface water availability at the project site or adjacent parcels, nor within the CIA under existing or proposed use conditions.

Requested values (A-C) per County of Lake, State of California Ordinance No. 3106 – An urgency ordinance requiring land use applicants to provide enhanced water analysis during a declared draught emergency.

A) The amount of water available for the project's well is defined by the aquifer characteristics within the CIA. As detailed in this report the available water in storage within the CIA is 8,080 AF. The proposed water use of the project is 7.92 AF/yr which represents a negligible 0.01% of the available water in storage.

B) The recharge rate as detailed in this report was calculated using both average and drought year annual precipitation values. The proposed water use of the project is 7.92 AF/yr representing 1.0% of the average annual available recharge and 1.7% of the available recharge during a drought year.

C) The cumulative impact of water use to the surrounding areas takes into account the proposed projects water use and the existing water use of properties within the CIA. The cumulative water use for the CIA is 211 AF/yr representing 2.6% of the available water in storage, 28% of the available recharge during average annual precipitation and 46% of the available recharge during a drought year.

6.0 DROUGHT MANAGEMENT PLAN

During non-drought emergencies the expected water use for the proposed four acres of cannabis irrigation and employee facilities is anticipated to be approximately 7.92 AF/yr (acre feet per year). During a declared drought emergency, Lake County has requested that water usage is reduced by 20%, which equates to 6.34 AF/year of water use for cannabis irrigation and employee facilities. A 20% reduction of water use for the proposed project in combination with a 20% reduction of water use from the surroundings properties within the CIA will decrease the impacts of the draught emergency.

The existing Property Management Plan (for 4379 & 4457 New Long Valley Road) already contains sections on water use and water conservation. Per the plans water conservation, cannabis irrigation will use an efficient drip irrigation system. Areas inside the cultivation area will have groundcover applied to conserve soil moisture within the cultivation area. Such methods including time of day irrigating promotes water infiltration in to the soil and decreases potential evaporation.

Since the proposed project will already be utilizing an efficient irrigation system and best management practices to minimize groundwater consumption an additional 20% reduction in water use for a drought emergency will likely require a combination of reduced crop size and less than optimal crop irrigation to successfully meet the 20% reduction goal.

To properly determine the success of the draught emergency plan metering and recording of the groundwater use from the property will be necessary.

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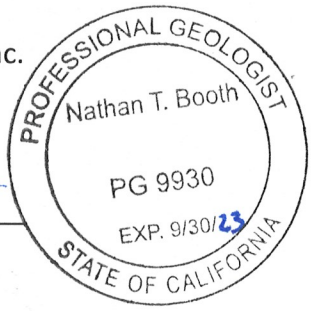
7.0 LIMITATIONS

This report was prepared in accordance with generally accepted standards of professional hydrogeologic consulting 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. 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

If you have any questions regarding the information contained in this report, please do not hesitate to contact us at 707-837-6247

Sincerely,
Western Groundwater Surveyors, Inc.



Nathan Booth
Professional Geologist-9930
President, Western Groundwater Surveyors

WESTERN GROUNDWATER
SURVEYORS, INC.

8.0 REFERENCES

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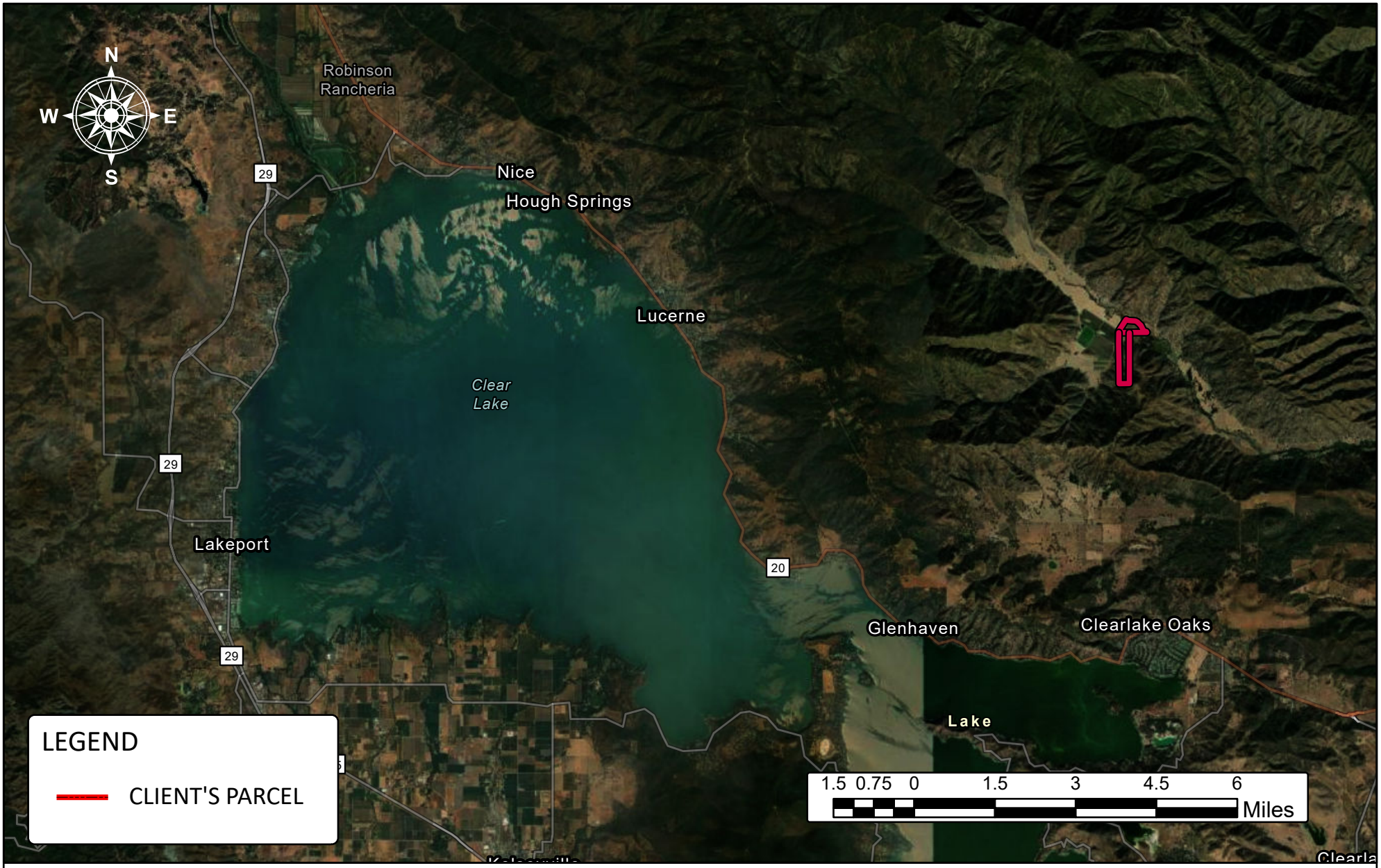
*Property Management Plan for 4379 & 4457 New Long Valley Road. 9-1-2020. (*Provided to WGS by client).

Structure Sections along the Bartlett Springs Fault Zone and Adjacent Area from Round Valley to Wilbur Springs, Northern Coast Ranges, California.

WESTERN GROUNDWATER
SURVEYORS, INC.

APPENDIX A

FIGURES

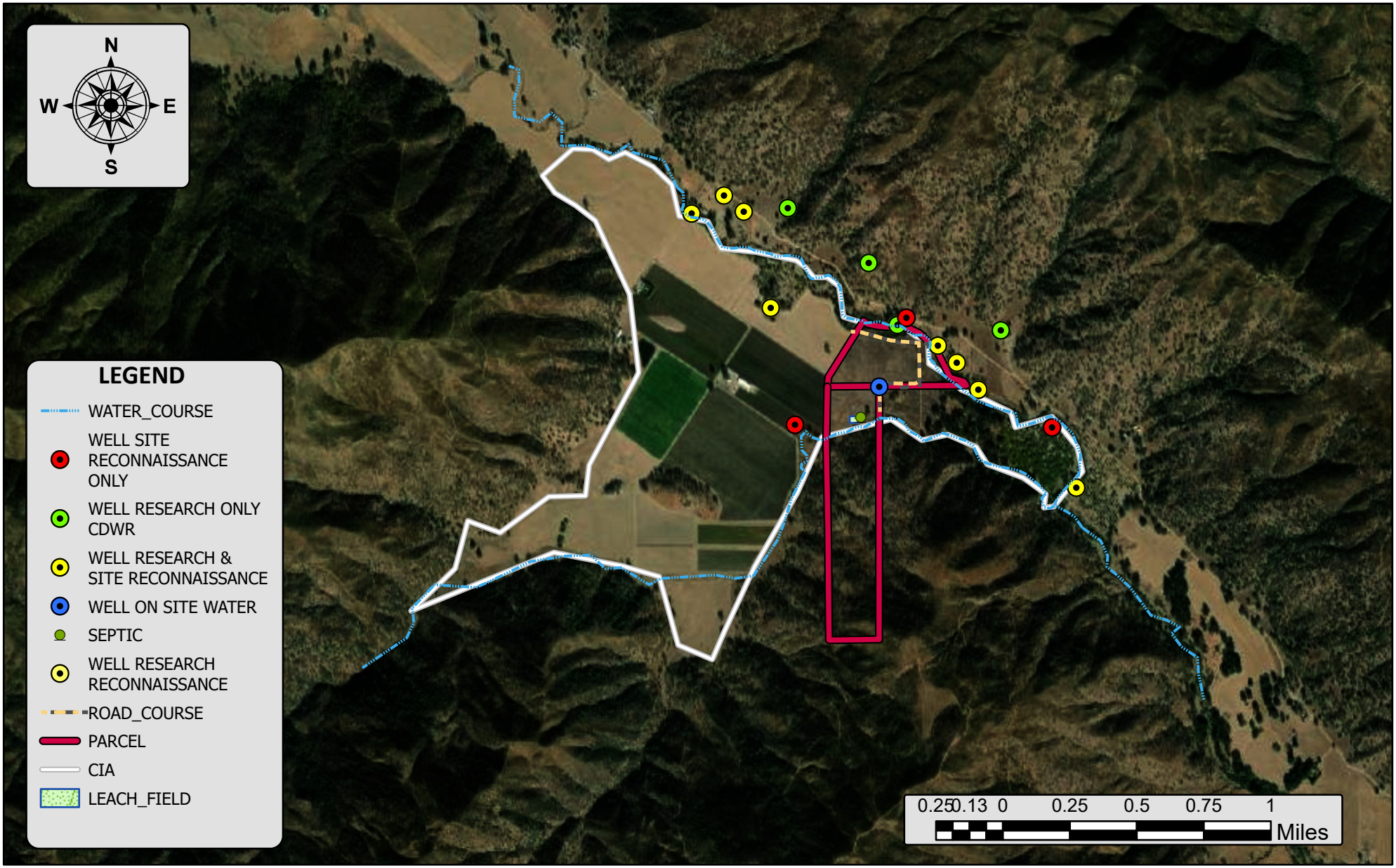


WESTERN GROUNDWATER SURVEYORS, INC.
8733 Lakewood Drive, Suite B
Windsor, CA 95492

Raphael Knapp
Figure 1
Vicinity Map

4457 & 4379 New Long Valley Road, Clearlake Oaks, Lake County, CA 95423

CREDITS: JR BROWN
12/13/2021

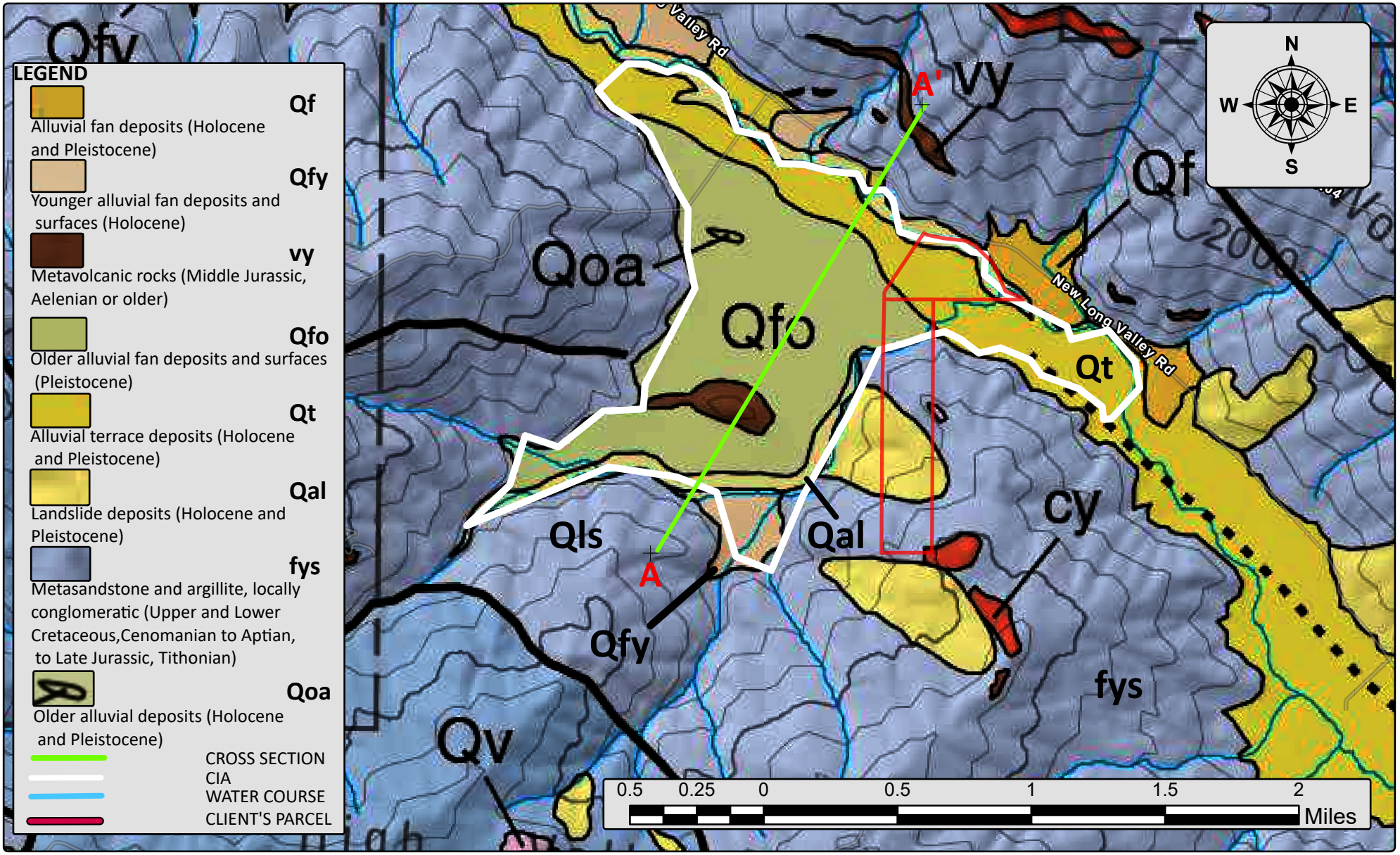


WESTERN GROUNDWATER SURVEYORS, INC.
8733 Lakewood Drive, Suite B
Windsor, CA 95492

Raphael Knapp
Figure 2
Site Map

4457 & 4379 New Long Valley Road, Clearlake Oaks, Lake County, CA 95423

CREDITS: JR BROWN
12/13/2021

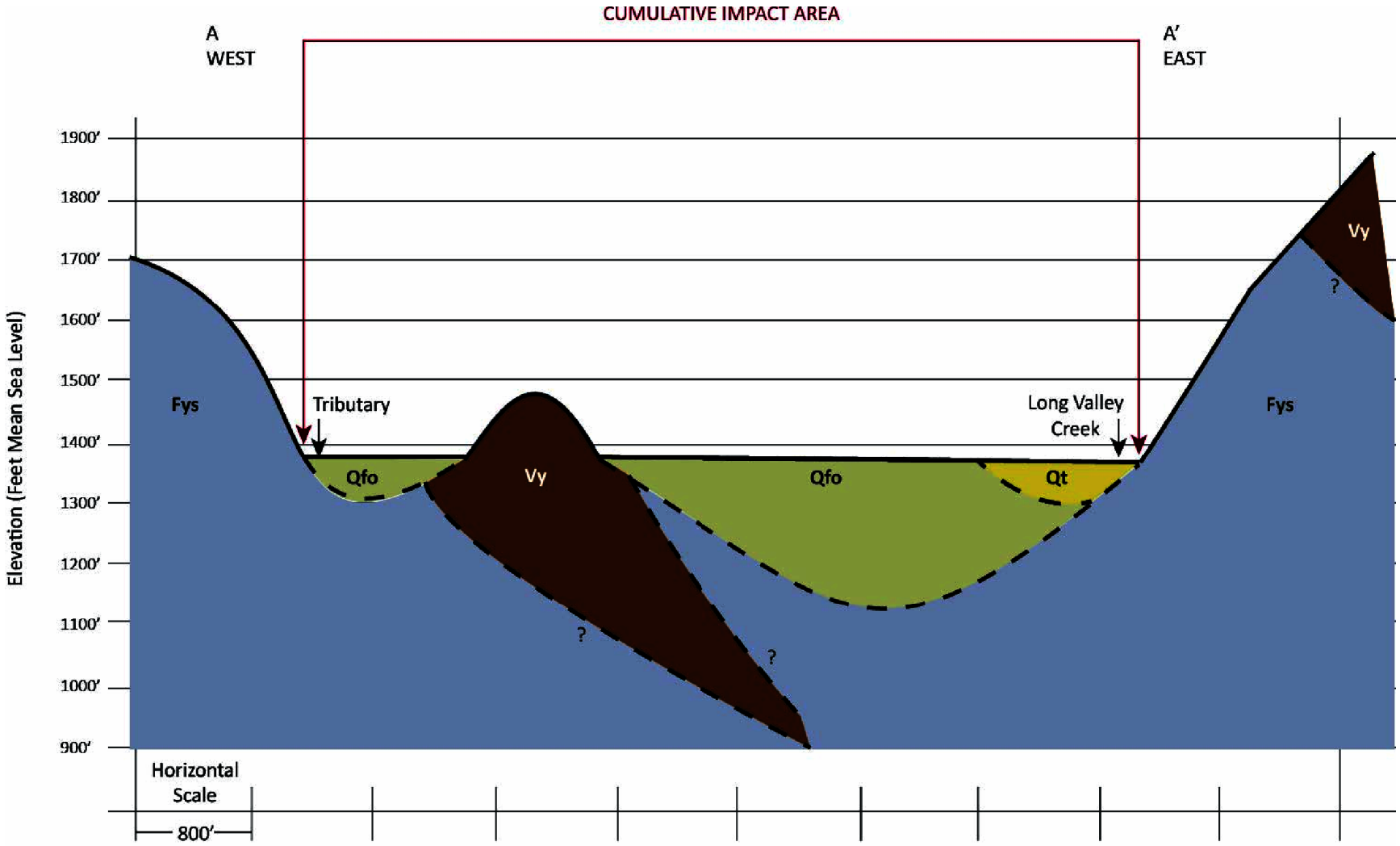


WESTERN GROUNDWATER SURVEYORS, INC.
8733 Lakewood Drive, Suite B
Windsor, CA 95492

Raphael Knapp
Figure 3
Geological Map

4457&4379 New Long Valley Road, Clearlake Oaks, Lake County, CA 95423

CREDITS: JR BROWN
12/21/2021



WESTERN GROUNDWATER
SURVEYORS, INC.
8733 Lakewood Drive, Suite B
Windsor, CA 95492

Raphael Knapp
Figure 4
Geologic Cross Section A-A'

4457&4379 New Long Valley Road, Clearlake Oaks, Lake County, CA 95423

CREDITS: JR Brown & D Stanley 12/21/2021

Note: See Figure 3 for Geologic definitions

WESTERN GROUNDWATER
SURVEYORS, INC.

APPENDIX B

WELL COMPLETION REPORTS

for WELLS within CIA

14N/07W-08M

ORIGINAL
File with DWR

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATER WELL DRILLERS REPORT

Do not fill in

No. 349823

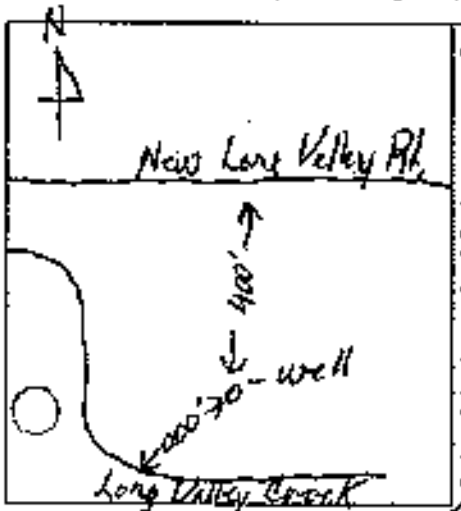
( ) e of Intent No. _____
Local Permit No. or Date _____

State Well No. _____
Other Well No. _____

(12) WELL LOG: Total depth 40 ft. Completed depth 38 ft.

from ft.	to ft.	Formation (Describe by color, character, size or material)
0	2	Brn. soil and Gravel
2	20	Brn. Clay
20	40	Sand and Gravel

(2) LOCATION OF WELL (See instructions):
County Lake Owner's Well Number _____
Well address if different from above APN 06-009-57
Township 14N Range 7W Section 8
Distance from cities, roads, railroads, fences, etc.
3505 New Long Valley Rd.
Clearlake Oaks, CA.



WELL LOCATION SKETCH

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

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

(5) EQUIPMENT:
Rotary [X] Reverse [ ]
Cable [ ] Air [X]
Other [ ] Bucket [ ]

(6) GRAVEL PACK:
Yes [X] No [ ] Size 3/8
Diameter of bore 8 3/4
Packed from 20 ft. to 38 ft.

(7) CASING INSTALLED:
Steel [ ] Plastic [X] Concrete [ ]

From ft.	To ft.	Dia in.	Gage or Wall
0	38	4"	160

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

From ft.	To ft.	Slot size
31	38	1/8

(9) WELL SEAL:
Was surface sanitary seal provided? Yes [X] No [ ] If yes, to depth 20 ft.
Were strata sealed against pollution? Yes [ ] No [X] Interval _____ ft.
Method of sealing Concrete

(10) WATER LEVELS:
Depth of first water, if known 30 ft.
Standing level after well completion 30 ft.

(11) WELL TESTS:
Was well test made? Yes [X] No [ ] If yes, by whom? Driller
Type of test Pump [ ] Bailer [ ] Air lift [X]
Depth to water at start of test 32 ft. At end of test 38 ft.
Discharge 40 gal./min after 1 hours Water temperature _____
Chemical analysis made? Yes [ ] No [X] If yes, by whom? _____
Was electric log made Yes [ ] No [X] If yes, attach copy to this report

Work started 1-12 19 90 Completed 1-14 19 90

WELL DRILLER'S STATEMENT: 1603

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

Signed Dan McMullen (Well Driller)
NAME Dan McMullen Well Drilling (Person, firm, or corporation) (Type or print)
Address 14487 Old Long Valley Rd.
City Clearlake Oaks CA ZIP 95423
License No. 533152 Date of this report 1-14-90

JAN 17 1990

VOID INITIAL
NOT FOR PUBLIC USE
WATER CODE SEC. 13752
ONLY

DWR 188 (REV. 12-88) IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM 85 30355

State of California

Well Completion Report

Form DWR 188 Complete 5/14/2018

WCR2018-003486

Owner's Well Number: Long Valley Well 3 | Date Work Began: 04/19/2018 | Date Work Ended: 04/27/2018

Local Permit Agency: Lake County Health Services Department - Environmental Health Division

Secondary Permit Agency: | Permit Number: WP0002201 | Permit Date: 03/20/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: XXXXXXXXXXXXXXXXXXX

Mailing Address: XXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXX

City: XXXXXXXXXXXXXXXXXXX | State: XX | Zip: XXXXX

Planned Use and Activity

Activity: New Well

Planned Use: Water Supply Irrigation - Agriculture

Well Location

Address: 4881 NEW LONG VALLEY RD

City: CLEARLAKE OAKS | Zip: 95423 | County: Lake

Latitude: Deg. Min. Sec. N | Longitude: Deg. Min. Sec. W

Dec. Lat.: 39.0872000 | Dec. Long.: -122.6784000

Vertical Datum: | Horizontal Datum: WGS84

Location Accuracy: | Location Determination Method:

APN: 006-009-350

Township: 14 N

Range: 07 W

Section: 06

Baseline Meridian: Mount Diablo

Ground Surface Elevation:

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Reverse Circulation | Drilling Fluid: Bentonite

Total Depth of Boring: 135 Feet

Total Depth of Completed Well: 130 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: (Feet) | Date Measured:

Estimated Yield*: 1000 (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	13	TOP SOIL / CLAY
13	95	GRAVEL
95	135	HARD ROCK

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	30	Blank	Low Carbon Steel	Grade: ASTM A53	0.312	16			
1	30	110	Screen	Low Carbon Steel	Grade: ASTM A53	0.312	16	Louver	0.06	
1	110	130	Blank	Low Carbon Steel	Grade: ASTM A53	0.312	16			
1	130	135	No Casing Installed	Other	N/A					NO CASING

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	20	Cement	10.3 Sack Mix		ANNULAR SEAL
20	135	Filter Pack	Other Gravel Pack	4 X 16	GRAVEL PACK

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	135	24

Certification Statement

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

Name: WELL INDUSTRIES INC
Person, Firm or Corporation

3282 HIGHWAY 32 (Address) | CHICO (City) | CA (State) | 95973 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 05/03/2018 (Date Signed) | 812678 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

				N						W

Latitude Deg/Min/Sec **Longitude Deg/Min/Sec**

TRS:

APN:

006-009-23

QUADRUPLICATE
For Local Requirements

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet

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

Page ___ of ___
Owner's Well No. WE 2993
No. 0951442
Date Work Began 6/17/2014, Ended 6/19/2014
Local Permit Agency Lake County Environmental Health
Permit No. WE2993 Permit Date 2/6/2014

GEOLOGIC LOG

ORIENTATION (✓) X VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)
DRILLING METHOD Rotary FLUID Mud

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain size, color, etc.*
0	3	Brown Soil
3	7	Brown Clay
7	8	Sand + Gravel
8	15	Brown Clay
15	36	Sand + Gravel
36	41	Gray Clay
41	52	Sand + Gravel
52	54	Gray Clay

RECEIVED
AUG 19 2014
ENVIRONMENTAL HEALTH

TOTAL DEPTH OF BORING 54 (Feet)
TOTAL DEPTH OF COMPLETED WELL 52 (Feet)

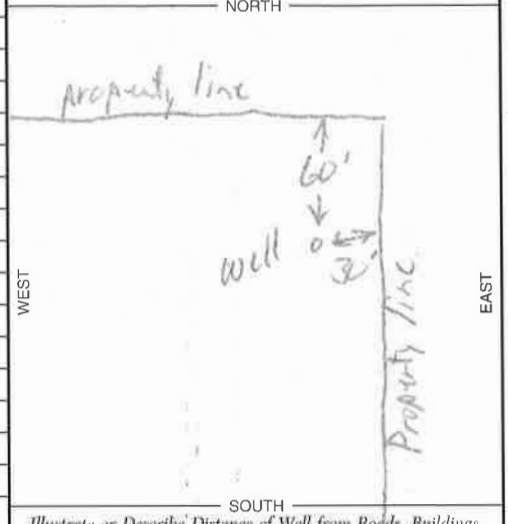
WELL OWNER

Name Raphael Knapp
Mailing Address 1123 West Stanley St
City Ukiah State CA ZIP 95482

WELL LOCATION

Address 4454 New Long Valley Rd.
City Clearlake Oaks
County Lake
APN Book 006 Page 009 Parcel 23
Township ___ Range ___ Section ___
Lat ___ DEG. ___ MIN. ___ SEC. N
Long ___ DEG. ___ MIN. ___ SEC. W

LOCATION SKETCH



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

ACTIVITY (✓)

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

USES (✓)
WATER SUPPLY
X Domestic ___ Public
___ Irrigation ___ Industrial
MONITORING ___
TEST WELL ___
CATHODIC PROTECTION ___
HEAT EXCHANGE ___
DIRECT PUSH ___
INJECTION ___
VAPOR EXTRACTION ___
SPARGING ___
REMEDIATION ___
OTHER (SPECIFY) ___

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 18 (Ft.) & DATE MEASURED 6/19/2014
ESTIMATED YIELD * 50 (GPM) & TEST TYPE Air lift
TEST LENGTH 1/2 (Hrs.) TOTAL DRAWDOWN ___ (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	22	9	X				PVC / F480	4½	SDR26	
22	52	9		X			"	"	"	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	1	X			
1	21		X		
21	52				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 Dan McMullen Well Drilling
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)
ADDRESS PO Box 951 CITY Lower Lake STATE CA ZIP 95457
Signed Dan McMullen
C-57 LICENSED WATER WELL CONTRACTOR
DATE SIGNED 6/19/2014 C-57 LICENSE NUMBER 533152

DWR 188 REV. 05-03

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

WP0000476

JIM'S PUMPS
P.O. Box 474
Upper Lake, CA 95485
Telephone 707-349-2277
Jose Fernandez Jr.
CA# 993066

WELL TEST REPORT

JOB Rapheal Knapp SIZE TURBINE 2hp

LOCATION 4457 New Long Valley Rd. Spring Valley CA SETTING Unknown

WELL DEPTH Unknown CASING SIZE 4" STATIC LEVEL 29'

DATE STARTED 9-22-21 DATE COMPLETED 9-22-21

DATE 9/22/21	TIME A.M.	TIME P.M.	OPERATOR	G.P.M.	DRAWDOWN	WATER COLOR
		12:00	Evan	21.4	29'	Clear
		12:15	Throttle up	60	30'	↓
		12:30	Throttle up	100	30'	
		12:45		100	30'	
		1:00		100	30'	
		1:30		100	30'	
		2:00		100	30'	
		2:30		100	30'	
		3:00		100	30'	clear
			End Test			
		3:00	Start Recovery	0	30'	
		3:15	End Recovery	0	29'	

COMMENTS:

At this time we feel this well is capable of (100 gpm). Note: All results are subject to change depending on time of year and weather conditions.

Evan Lucci

WESTERN GROUNDWATER
SURVEYORS, INC.

SUBJECT:	Initial Site Evaluation For: State Water Resources Control Board (SWRCB) Cannabis Order and CA. Department of Fish & Wildlife (CDFW)
LOCATION:	4457 & 4379 New Long Valley Road, Clearlake Oaks, Lake County, CA
PREPARED FOR:	Raphael Knapp
PREPARED BY:	Christine Escalante
DATE:	9-21-2021

PROJECT
This technical memorandum documents the results of an initial site evaluation at 4457 & 4379 New Long Valley Road, Clearlake Oaks, CA 95426

Description and Scope of Services Provided as Part of Initial Site Evaluation

- Determination of need for enrollment in the State Water Resources Control Board (SWRCB) Cannabis Program
- Assessment of the property to determine Tier level (I or II) designation and which risk level (low, moderate, or high) the property will be enrolled in under SWRCB Cannabis Program.
- Determine the technical reports required based on Tier determination and risk level for the property under enrollment in the SWRCB Cannabis Program.
- Provide a list of permits or agreements required (if any) for CLIENT property development plans as well as permits or agreements required for completion of corrective actions in the Technical Reports. This is limited to the following permits: grading, sewage disposal, 1600 stream bed alterations (CDFW), water quality (RWQCB), water rights (SWRCB), dredge/fill (USACE).
- Assessment of the water source(s) on the property and determination of necessary permits or agreements for use, diversion, and storage.
- Assessment of the property for compliance with the CA. Department of Fish & Wildlife (CDFW) for cannabis cultivators

Description and Scope of Services NOT Provided as Part of this Initial Site Evaluation

- Permitting, surveying, geotechnical/structural engineering, enrollment in SWRCB Cannabis Program, technical reports for SWRCB Cannabis Program, Annual Monitoring and Reporting (AMR) for SWRCB Cannabis Program, culvert sizing, Lake or Streambed Alteration (LSA) Notification with CDFW, water rights, biological study, pond survey, mapping, 401 Water Quality Certification application, Annual Water Use reporting
- Site Map / Plot Plan / Property Diagram / Premises Diagram for County or CDFA application
- Any services not listed in the “Description and Scope of Services to be Provided” section

Site Description
The subject property consists of two parcels totaling approximately 99 acres located in Lake County in the Long Valley Creek watershed, HUC12 180201160406. APNs: 006-009-23 and 006-009-53. Access to the property is Hwy 101 exit River Road and go east. Continue onto Mark West Springs Road then continue onto Porter Creek Road. Turn left onto Petrified Forest Road, left onto CA 128-

W/Foothill Blvd, right onto Tubbs Land then left onto CA 29-N. At the traffic circle take the 2nd exit and stay on CA 29-N. Continue onto CA 53N, turn right onto Hwy 20 E then left onto New Long Valley Road.

The property is served by PG&E, a water well, and a County approved onsite sewage disposal system. There are no structures on the property; everything on the property burned down in the fires of 2018. Four stream crossings, one spring, and one on-stream pond was identified on the property. There are no anticipated issues with environmental compliance on this property and enrollment in the State Water Resources Control Board (SWRCB) cannabis program or with securing a Lake or Streambed Alteration (LSA) Agreement with the CA Department of Fish & Wildlife (CDFW).

Cannabis Cultivation

There is currently no cannabis cultivation on the property. There are two old cultivation sites that burned down in the fires of 2018 and have not been redeveloped.

The State Water Resources Control Board (SWRCB) has requirements for new cultivation site development or expanding existing sites. Please see the section below titled "**Expanding and/or New Cultivation Site Development**" for information from the SWRCB regarding expanding or new site development.

- Front Parcel - new cultivation site development:
  - No grading is anticipated to be required to develop a new cultivation site,
  - The natural slope of the parcel is estimated to be 1 – 3%,
  - The entire parcel is well vegetated with grass,
  - There is approximately 13+ acres of area that can be developed for cannabis cultivation and meet all setback requirements to property/parcel lines (75'), and creeks,
    - All cultivation will need to be at least 100 feet from any nearby watercourses,
  - Cultivation on the front parcel will be assessed as a Low Risk,
  - Tier designation will be determined based on total disturbed area:
    - Tier I designation for disturbed area up to one acre
    - Tier II designation for disturbed area over one acre

- Back Parcel – new cultivation site development on flat area before creek; there are no good locations to develop cultivation sites on the back parcel past the creek
  - No grading is anticipated to be required to develop a new cultivation site,
  - The natural slope of the flat area of the parcel is estimated to be 1 – 3%,
  - The area is well vegetated with grass,
  - There is approximately 4+ acres of area that can be developed for cannabis cultivation and meet all setback requirements to property/parcel lines (75'), and creeks,
    - All cultivation will need to be at least 100 feet from any nearby watercourses,
  - Cultivation on the part of the back parcel before the creek will be assessed as a Low Risk,
  - Tier designation will be determined based on total disturbed area:
    - Tier I designation for disturbed area up to one acre
    - Tier II designation for disturbed area over one acre

Determination of Enrollment
The following criteria is used by the SWRCB to determine need for enrollment: *Disturbed area greater than 2,000 square feet.*

Estimated total disturbed area will be greater than **10,000 ft^2** and will be required by the SWRCB to enroll in the program.

Tier Assessment and Risk Designation
Based on the initial site evaluation, the property will be assessed as Tier I for disturbed area up to one acre and the risk designation will be Low. If the total disturbed area for cannabis cultivation will be greater than one acre (43,560 ft^2) then the property will be assessed as Tier II.

Tier I assessment if the following requirements are meet:
- **Disturbed area between 2,000 square feet and 1 acre**

Tier II assessment if the following requirements are meet:
- **Disturbed area greater than 1 acre**

Low Risk if:
- **Disturbed area located on slopes less than 30 percent**
- **Disturbed area complies with riparian setbacks**

Required Management Plans within 90 days of enrollment
- **Site Management Plan**
  - **Required for all sites**
- **Site Closure Report**
  - **Required 90 days prior to ending cultivation**

Annual Fee Schedule

Tier 1

Low Risk $600

Water Use, Diversion and Storage
There are three existing sources of water for the property: one existing well, one spring, and one on-stream pond.

Well (39.088154, -122.674149)
There is one well on the property that has Well Completion Report No. 0951442. The well is 54 feet deep, has a 4.5" diameter PVC casing, is sealed from zero to 1 foot with cement, is sealed from 1 foot to 21 feet with bentonite, and has perforated pipe from between 22 and 52 feet below ground surface.

The well is:
- greater than 415 feet from a Class II creek to the south of the well and the well is lower in elevation than the nearby creek by approximately 10 feet,
- greater than 960 feet from a Class II creek to the northwest of the well and the elevation difference is approximately 6 feet.

No additional water rights are anticipated to be required for the well.

On-Stream Pond (39.082909, -122.675082)
Pond Outlet Culvert, POC (39.082858, -122.675245)
One on-stream pond was identified on the property that is fed by two creeks, possibly a spring, and has a 17" CMP pond outlet culvert (POC). Review of historical Google Earth Pro imagery shows a pond at this location from at least 1993. No water is used from the pond for any purpose; there is no infrastructure to move water into or out of the pond.

After the fires in 2018, FEMA went through and cleaned up and removed all burned materials from the property. It is thought that at this time, during property cleanup past the pond, that a new road spur was created along the edge of the dam or through the bottom of the dam that destroyed the pond outlet spillway the culvert discharged onto. Water now runs from the outlet culvert down the road and is causing erosional issues. The new road spur may have cut into or destabilized part of the dam and the dam may now be leaking additional water that is flowing down the road and causing severe erosional issues on the road segment just before the start of the dam.

It is our recommendation that the pond is removed and the watercourse restored. The pond outlet culvert is too small and requires replacement with a minimum 48-inch culvert and will need to be long enough (approximately 80 feet) to discharge into the watercourse on the other side of the road.

If the pond will be kept, CDFW will require that the on-stream pond and outlet culvert are listed as a project on an LSA Notification and will require that a bypass flow mechanism is installed in the pond to meet the Waterboard's Instream Flow Requirements for on-stream ponds. CDFW will require that 80 – 90% of the water flowing into the pond is allowed to bypass the pond and continue to flow downstream at all times water is flowing into the pond.

There are two paths forward with CDFW and the pond:
1) keep the pond, replace the outlet culvert with a larger culvert, and install a bypass flow mechanism;
2) remove the pond and restore the watercourse.

Either path forward will require civil engineering to create a topographic map that will allow for 1) the design of a new outlet culvert and a bypass flow mechanism if the pond is kept; or 2) the creation of a grading plan to remove the pond and restore the watercourse.

Spring (39.081020, -122.675532)
One spring was identified on the property that was developed by the previous landowner. The spring is not in use and there are currently no plans to use this spring. There is a 2-inch white PVC pipe installed into the ground to allow water to be diverted to an unknown location. If the spring will not be used for any purpose, it is our recommendation that as much of the PVC pipe is removed or permanently capped so it is obvious that water is not being diverted.

Water from this spring can be used as long as the appropriate water rights are filed. If water from this spring will be used for cannabis irrigation, a Small Irrigation Use Registration (SIUR) water right will need to be filed with the Water Board's Department of Water Resources (DWR).

An SIUR allows water to be diverted into storage in the wet winter (usually Nov 1st through March 31st) for use in the dry summer when water diversions will not be allowed (April 1st through Oct 31st). No water may be diverted from the spring for cannabis irrigation from April 1st through Oct 31st.

The CA Dept of Fish and Wildlife (CDFW) will impose restrictions on the when and how water may be diverted from the spring: water will only be allowed to be diverted into storage from Nov 1st through March 31st and CDFW will require that a minimum of 80 – 90% of the spring water is allowed to bypass the point of diversion (at all times when water is flowing) and allowed to flow downhill.

CDFW will require that all on-stream ponds and water diversions are listed as projects on an LSA Notification whether cannabis related or not. Therefore, the on-stream pond will need to be listed as a project on an LSA Notification and if the spring will be used, it too will need to be listed as a project.

There are no water tanks on the property at this time.

Road Maintenance. The SWRCB states: Cannabis cultivators shall ensure that access roads are not allowed to develop or show evidence of significant surface rutting or gullying. Cannabis cultivators shall ensure that access roads are out-sloped whenever possible to promote even drainage of the access road surface, prevent the concentration of storm water flow within an inboard or inside ditch, and to minimize disruption of the natural sheet flow pattern off a hill slope to a stream. If unable to eliminate inboard or inside ditches, the cannabis cultivator shall ensure adequate ditch relief culverts to prevent down-cutting of the ditch and to reduce water runoff concentration, velocity, and erosion.

Road Assessment
The road on the back parcel shows evidence of significant and substantial rutting and erosional issues caused by too much water flowing down the road. There are no mechanisms for directing water off the road; there is no inside ditch or ditch relief culverts at any point on the road and the road is not outsloped.

There are two paths forward with the road on the back parcel: keep the road or decommission the road. If the road <u>will be kept</u>, it will require fixing by filling holes, ruts, and trenches caused by water erosion, resurfacing the road, and installation of an inside ditch and ditch relief culverts and/or outsloping the road, where feasible. If the road <u>will not be kept</u>, it will still need to be fixed enough to allow for vehicle and construction equipment to access the entire road on the back parcel (up to the spring) and the pond for removal of the pond and restoration of the watercourse.

After the pond work has been completed, the entire road can then be officially decommissioned (including stream crossings) and no further work would be required on the back road expect for annual monitoring.

Decommissioning the road may involve ripping the road bed with heavy equipment, installing cross-road drains (similar to waterbars but too deep for vehicles to drive over), and revegetating the old road with seed and mulch and if needed, straw mulch.

- Road Segment one, RS1 (39.086977, -122.674794)
    - Road segment leading to stream crossing SC1
    - There is no road for approximately 600 feet leading to SC1 as the road has become so overgrown that it is not discernable or drivable at this time
    - The road segment at stream crossing SC1 is not accessible by any vehicle at this time

- Solutions:
  - If the road on the back parcel will be kept, this road segment needs to be permanently created for vehicle traffic to drive to SC1
  - If the road on the back parcel will not be kept, this road segment will need to be created on a temporary basis to allow for vehicle and construction equipment to access the back parcel to remove the pond, restore the watercourse, decommission the stream crossings, and decommission the road.

- Road Segment two, RS2 to Road Segment four, RS4 at Pond
  - The entire road from stream crossing SC1 up to the pond
  - Too much water flowing down the road has caused substantial ruts and severe erosional issues
  - There are no mechanisms for dewatering the road; there is no inside ditch or ditch relief culverts and the road is not outsloped
  - The entire road requires substantial repair
- Solutions:
  - If the road on the back parcel will be kept, fill in holes and trenches caused by erosion and regrade then resurface the road
    - Road work shall include either outsloping the road and installing rolling dips if feasible, and/or crowning the road and creating an inside ditch and installing ditch relief culverts per the Rural Road Handbook standards
  - If the road on the back parcel will be decommissioned, the road section will still require repair by filling holes and trenches to allow for vehicle and construction equipment to drive up road to access the road up to the spring

- Road Segment five, RS5
  - Road segment along creek to stream crossing SC4
  - This road segment does not go anywhere and should be decommissioned
- Solutions:
  - Remove fencing and decommission the road: if needed, rip the road and install cross road drains, remove fill from stream crossings and place seed and mulch on bare ground as needed.

Stream Crossings

CDFW will require that all stream crossings and the on-stream pond outlet culvert are listed as projects on an LSA Notification and requires that the entire property meet CDFW standards, whether cannabis related or not. Therefore, the four stream crossings and on-stream pond outlet culvert located on the back parcel will all need to be listed as projects on an LSA.

If the back road will be kept, all 4 stream crossings must meet CDFW standards and CDFW will require that the stream crossings are designed with either a culvert, a rocked ford crossing, or an armored fill crossing. And the pond outlet culvert will also require replacement with a larger and longer culvert.

If the back road will not be kept, the stream crossings will need to be officially decommissioned as part of decommissioning the road by removal of all fill from the crossing, dipping the road to constrain the stream in a high flow event, and if needed, installing riprap rock to armor the crossing and prevent erosional issues.

- Stream Crossing SC1 (39.086454, -122.675600)
  - No culvert,
  - If the back parcel will need to be accessed during wet weather, a new stream crossing will need to be designed with a bridge
  - If the back parcel does not need to be accessed during wet weather, a low water crossing will need to be designed for a rocked ford or armored fill crossing.
    - Vehicles may not drive through a low water crossing if there is any water in the crossing
  - Solutions:
    - If the back parcel will be accessed for any purpose; this stream crossing will need to be designed with a bridge or low water crossing
    - Or, this stream crossing will need to be decommissioned if back the parcel is not accessed for any purpose

- Stream Crossing SC2 (39.081543, -122.674852)
  - No culvert,
  - This stream crossing is on the road segment past the pond that is seldom, if ever used
  - A minimum 30-inch culvert would be required
  - Install an armored fill or rocked ford crossing
    - Vehicles may not drive through a low water crossing if there is any water in the crossing
  - Solutions:
    - This stream crossing will need to be designed for a low water crossing or a 30-inch projecting culvert
    - Or, this stream crossing will need to be decommissioned if back parcel is not accessed for any purpose

- Stream Crossing SC3 (39.086356, -122.675612)
  - No culvert,
  - Stream crossing is on spur road just past SC1 that does not go anywhere
  - Minimum 24-inch culvert would be required
  - This road and stream crossing should be decommissioned, or
  - Design new stream crossing
  - Solutions:
    - This stream crossing will need to be designed with a minimum 24-inch culvert or low water crossing
    - Or, this stream crossing will need to be decommissioned if back parcel is not accessed for any purpose

- Stream Crossing SC4 (39.086494, -122.674423)
  - No culvert,
  - Stream crossing is on spur road just past SC1 that does not go anywhere as the road is not accessible past SC4 due to a massive erosional feature that has destroyed the road where the creek meets the landing
  - The erosion caused by the creek is too substantial to fix and keep the road or create a new stream crossing with a minimum 36-inch projecting culvert
  - Solutions:
    - Decommission road and stream crossing

- Pond Outlet Culvert (39.082858, -122.675245)
  - 17" culvert,
  - Culvert is too short and does not discharge into the nearby channel,
  - The culvert is undersized to meet the 100-year peak streamflow event and associated debris requirements and will require replacement with a minimum 48-inch projecting culvert
  - Solutions:
    - The pond outlet culvert will need to be redesigned with a minimum 48-inch projecting culvert

Required Permits or Agreements

Based on our initial site evaluation we anticipate the need for:

- Enrollment in the SWRCB Cannabis program
- 1602 Lake or Streambed Alteration (LSA) permit with California Department of Fish and Wildlife (CDFW)
- Small Irrigation Use Registration (SIUR) for pond if used for cannabis irrigation
- Small Irrigation Use Registration (SIUR) for spring if used for cannabis irrigation
- 401 Water Quality Certification (WQC) from Water Board for any work on a stream crossing or on-stream pond
- Civil Engineering if pond is to be removed and watercourse restored
- Grading permit if pond is to be removed and watercourse restored

State Water Resources Control Board Cannabis General Order Information:

Petroleum Storage

The SWRCB wants all petroleum products stored off the ground, inside closed sheds (with a floor and door), and if possible, inside secondary containment such as a plastic bin. The SWRCB states that cultivators shall establish and use a separate storage area for pesticides, and fertilizers, and another storage area for petroleum or other liquid chemicals.

Amendment / Chemical Storage

The SWRCB wants all amendments / chemicals stored off the ground, inside closed sheds (with a floor and door), and if possible, inside secondary containment such as a plastic bin. The SWRCB states that cultivators shall establish and use a separate storage area for pesticides, and fertilizers, and another storage area for petroleum or other liquid chemicals.

Spoils Management

The SWRCB stats that all spent soil (spoils) shall be stored outside the riparian setback, shall not be stored in locations of known slope instability, and shall store spoil piles to prevent sediment discharge in storm water. Storage practices may include the use of tarps and sediment control devices such as straw wattles / fiber rolls or silt fences.

Spoils may be disposed of at an appropriate disposal location or on the property. If disposed of on the property, place spent soil away from any watercourse or drainage on the contour, not more than 6-inches deep, walk on the soil to lightly compact it, then place a non-invasive native seed and mulch mix to revegetate. If there is any danger of precipitation before the site is revegetated, place straw mulch over the seed and mulch to prevent the rain from washing the seed away.

Cannabis Waste

The SWRCB Cannabis General Order states that "cannabis cultivators shall store waste materials (cannabis plant waste) outside the riparian setback and such materials shall not be stored in locations of known slope instability". Also, "cannabis cultivators shall either place the large organic material (cannabis plant waste) in long-term, upland storage sites, or properly dispose of these materials offsite." And, that "cannabis plant material may be disposed of onsite in compliance with any applicable CDFA license conditions."

Trash Management

Trash cans with locking lids, to prevent wildlife from getting into the trash, will need to implemented at all places of use (cultivation sites and any other location with cannabis related activity, as needed). Collected trash should be stored in a secured, covered location where animals cannot get into it and trash cannot be blown away into any watercourse.

Monofilament Netting

The SWRCB Cannabis General Order states "To minimize the risk of ensnaring and strangling wildlife, cannabis cultivators shall not use synthetic (e.g., plastic or nylon) monofilament netting materials for erosion control for any cannabis cultivation activities. This prohibition includes photo- or bio-degradable plastic netting."

Expanding and/or New Cultivation Site Development

The SWRCB Cannabis General Order states "Prior to land disturbance activities for new or expanded cannabis cultivation activities, the cannabis cultivator shall perform a records search of potential Native American cultural resources at a California Historical Resources Information System (CHRIS) information center." And, "the cannabis cultivator shall also request a search of the Sacred Lands Inventory that is maintained by the Native American Heritage Commission."

The SWRCB Cannabis General Order also states "Prior to commencing any cannabis land development or site expansion activities the cannabis cultivator shall retain a qualified biologist to identify sensitive plant, wildlife species, or communities at the proposed development site. If sensitive plant, wildlife species, or communities are identified, the cannabis cultivator and Qualified Biologist shall consult with CDFW and CAL FIRE to designate a no-disturbance buffer to protect identified sensitive plan, wildlife, and communities. A copy of the report shall be submitted to the appropriate Regional Water Board."

Limitations

The observations and recommendations contained in this technical memorandum are based on information obtained from a limited scope reconnaissance-level site review. Estimated costs should be used for planning purposes only and do not constitute an engineer's estimate of costs.