HYDROGEOLOGIC ASSESSMENT REPORT

for
Minor Subdivision
4825 Bodega Avenue
Petaluma, CA 94952
APN: 021-110-070

Prepared For:

Rick Young
LPL Investments LLC
121 Lakeville St.
Petaluma, CA 94952

April 26, 2024

Prepared By:

HURVITZ ENVIRONMENTAL SERVICES INC.
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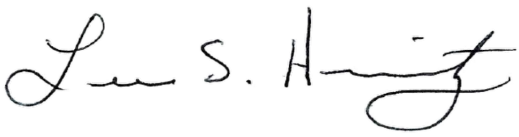


Lee S. Hurvitz, PG #7573 CHG #1015
Certified Hydrogeologist

Project No. 5259.01

HURVITZ ENVIRONMENTAL

GEOLOGIC & ENVIRONMENTAL CONSULTING

April 26, 2024

Rick Young
LPL Investments LLC
121 Lakeville St.
Petaluma, CA 94952

RE: Hydrogeologic Assessment Report
4825 Bodega Avenue, Petaluma, CA 94952
APN: 021-110-070

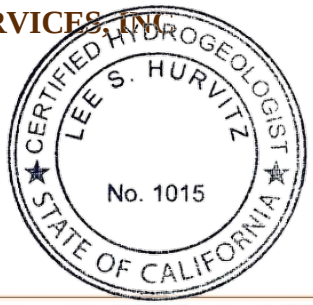
Dear Mr. Rick Young:

Hurvitz Environmental Services, Inc. (HES) is pleased to submit this Hydrogeologic Assessment Report (HAR) for the above referenced property. This report was prepared in accordance with the Sonoma County Permit and Resource Management Department (Permit Sonoma) Policy and Procedure Number 8-1-14 and General Plan Policy WR-2e. We understand that this report has been requested by Permit Sonoma due to a portion of the Site being located within the Medium Priority, Petaluma Valley Groundwater Basin. The purpose of this HAR was to evaluate the aquifer conditions at the site, which is located within a groundwater availability Class 1 (major groundwater basin) and Class 2 (major natural recharge basin) area, and to determine if the proposed groundwater usage is consistent with the Petaluma Valley Groundwater Basin Plan, and if the proposed development will create well interference, or impact nearby stream-flow.

Based on the findings presented herein, the quantity of groundwater to be used for the Project, compared to the quantity of available groundwater, indicates that pumping for the Project is unlikely to result in significant declines in groundwater resources over time. The Projects anticipated groundwater usage rates are consistent with the surrounding properties and based on the findings of this report, pumping and groundwater extraction at the new and existing Site wells will not significantly impact neighboring wells or near-site stream flow conditions. In addition, based on the relative distance to the coastal areas, the depth of the site well and the proposed water usage rates, salt water intrusion is not considered to be a concern to this Assessment.

We appreciate the opportunity to provide you with these services. Please do not hesitate to contact us at your convenience, should have any questions or comments regarding this report or our recommendations.

Sincerely,
HURVITZ ENVIRONMENTAL SERVICES, INC.



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1.0 INTRODUCTION AND SCOPE OF SERVICES

We understand that Mr. Rick Young, LPL Investments LLC (applicant) is applying to Sonoma County for a minor subdivision at the property identified as 4825 Bodega Avenue, Petaluma, CA 94952 (the Site). The proposed subdivision will consist of splitting the existing parcel (Assessor's Parcel Number (APN) 021-110-070), which is deeded 17.85-acres, into five (5) separate parcels ranging in size from 3 to 4.57 acres.

The Site is located within a Sonoma County Class 1 (major groundwater basin) and Class 2 (major natural recharge basin) groundwater availability area[1]. Typically, hydrogeologic assessments are only required for projects located in groundwater availability Class 3 and Class 4 areas. However, Permit Sonoma is requiring this hydrogeologic assessment because the Site is partially located in the Sate designated Medium Priority Petaluma Valley Groundwater Basin. Therefore, in accordance with the Permit Sonoma Procedures for Groundwater Analysis and Hydrogeologic Reports (Policy No. 8-1-14) we have prepared this hydrogeologic assessment report.

Policy WR-2e states that procedures for proving adequate groundwater should consider groundwater overdraft, land subsidence, saltwater intrusion, and potential impacts to neighboring wells and nearby creeks. Therefore, this groundwater report includes the following elements:

- Estimates of existing and future potential water uses at the site and surrounding properties.
- Characterization of local hydrogeologic conditions within the site watershed and sub-basin.
- Compilation and assessment of Well Completion Reports (drillers' logs) from the surrounding properties.
- Estimates of annual groundwater storage and recharge relative to existing and proposed groundwater uses.
- Assess potential for well interference between the project well and neighboring wells and between the project well and nearby streams.

[1] Groundwater Availability Map, Sonoma County Permit and Resource Management Division, April 1, 2004

2.0 SITE DESCRIPTION

The Site is located at 4825 Bodega Avenue, Petaluma, CA 94952, in an unincorporated, rural agricultural area of Sonoma County, approximately 5 miles northwest of downtown Petaluma, California. (**Plate 1 – Site Location Map**). The Sonoma County Assessor's Office identified the Site as APN 021-110-070 (**Plate 2 – Assessor's Parcel Map**) deeded 17.85 acres and zoned Rural Residential (RR-3).

The Site contains an existing residence, out buildings, extensive pasture lands, and a domestic groundwater well, as shown on **Plate 3 – Site Plan with Well Locations**. Site photographs are presented in **Appendix A** and the Engineered Site Plans are presented in **Appendix B**. The Site, and the nearby developed properties, are serviced by private septic systems and groundwater wells. There are no public sewer or water systems in this area.

The northern ½ of the Site is located in a Sonoma County Class 1 (major groundwater basin) groundwater availability area, and the southern ½ of the Site is located in a Sonoma County Class 2 (major natural recharge basin) groundwater availability area. The northern ¼ of the Site, including the existing Site well, is also located within the Petaluma Valley Groundwater Basin, and the entire Site is within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). The Site is also designated by Sonoma County as farmland of local importance and part of the West Petaluma Area Plan.

2.1 USGS 7.5 MINUTE QUADRANGLE MAP

HES reviewed the most recent United States Geological Survey (USGS) 7.5-minute Quadrangle Map, Petaluma, 2018 (**Plate 4 – Topographic Map**)[2]. The Sites westerly boundary is roughly defined by an ephemeral tributary to the Petaluma River. The ephemeral drainage flows northerly along the Sites boundary before crossing Bodega Avenue and merging with a larger, unnamed tributary stream. That intermittent tributary stream continues northeasterly for approximately 1.8 miles before merging with the Petaluma River near Rainsville Road.

The property slopes northerly and westerly from the Sites southwest boundary. The Site has a maximum elevation of approximately 180 feet above mean sea level (MSL) located near the southwest corner, and a minimum elevation of approximately 77 feet above MSL located along the northeast property boundary. Surface water run-off from the Site drains to the ephemeral stream that borders the site to the west.

2.2 GEOLOGICAL CONDITIONS

For information on the geologic formations present beneath the Site, HES reviewed published Geologic Maps[3]. According to the Maps reviewed (**Plate 5 – Geologic Map**), the Site is almost

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[2] USGS The National Map: National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau | USGS The National Map: 3D Elevation Program. Data refreshed January 2018. | USGS TNM – National Hydrography Dataset. Data refreshed January 2018.
[3]Geologic Map of the Cotati 7.5' Quadrangle Sonoma County, CA Digital Database Version 1.0, 2013.

entirely underlain by the Wilson Grove Formation. The Miocene to Pliocene age Wilson Grove Formation consists of fine - to medium-grained, thick-bedded to massively-bedded, moderate- to well-sorted, uncemented to weakly cemented fossiliferous marine sandstone. The Wilson Grove Formation is generally 650 to 950 feet thick based on outcrop exposures and drillers logs in the northwest and may be as much as 3,000 feet thick in the Wilson Grove Formation Highlands Basin[4].

The Wilson Grove Formation forms a single, continuous aquifer unit, due to general lithologic homogeneity and the absence of faults. The sand and sandstones of the Wilson Grove Formation are generally productive aquifers, with reported specific yield of 10 to 20 percent[5] and a range in specific capacity of 0.05 to 0.5 gpm/ft[6]. The yields of wells in the Wilson Grove Formation range from 100 to 1,500 gpm[7]. Recharge to the Wilson Grove aquifer in the vicinity of the Site is primarily through direct infiltration of precipitation as there are no intermittent or perennial creeks available for streambed recharge.

Below the Wilson Grove Formation is the Franciscan Complex (KJfs), a Cretaceous and Jurassic Graywacke and mélange - Massive to distinctly bedded, lithic wacke and dark-gray or black siltstone, shale, and slate, grading into mélange consisting of sheared argillite and graywacke matrix enclosing blocks and lenses of sedimentary, metamorphic, and volcanic rock.

2.3 REGIONAL GROUNDWATER

According to www.ecoatlas.com[8] the Site is located in the Petaluma River Subwatershed (HUC-12 -180500020601) and is under the jurisdiction of the SFBRWQCB. The watershed drains an area that is 28,641.41 acres (115.91 km^2).

The Site is mapped by California Department of Water Resources (DWR) as being partially within the Petaluma Valley Groundwater Basin (2-001) a medium priority groundwater basin[9]. The basin has a surface area of 46,043-acres (72 square miles). Groundwater makes up 28% of the water usage in this Basin. Average groundwater usage in the Basin is listed at 0.06 acre-feet/basin acre and includes residential, agricultural, and commercial uses from a total of 1,145 total groundwater wells. There are approximately 31 municipal supply wells in the Basin[10].

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[4] Powell, C.L., Allen, J.R., and P.J. Holland (Powell). 2004. Invertebrate Paleontology of the Wilson Grove Formation (Late Miocene to Late Pliocene), Sonoma and Marin Counties, California, with some Observations on Its Stratigraphy, Thickness, and Structure. U.S. Geological Survey Open-File Report 2004-1017.

[5] Herbst, C.M. 1982. Evaluation of Ground Water Resources: Sonoma County, Volume 3: Petaluma Valley. California Department of Water Resources Bulletin 118-4. 94 p.

[6] https://petalumavalleygroundwater.org/wp-content/uploads/00_PVGSP-Sect3_Basin-Setting_SONOMA-WATER-REVISED_Final_08252021.pdf

[7] California Department of Water Resources (DWR). 2014. Petaluma Valley groundwater basin: Bulletin 118 groundwater basin descriptions–Update June 30, 2014. 5 p.

[8] Eco Atlas has been developed through funding from the US Environmental Protection Agency and the California State Water Resources Control Board.

[9] California Department of Water Resources (DWR). 2020. Sustainable Groundwater Management Act 2019 Basin Prioritization, Process and Results. May.

[10] https://gis.water.ca.gov/app/bp-dashboard/final/

3.0 SITE DEVELOPMENT AND WATER USE

Currently, the Site contains a single rural residence, several barns and out-buildings with pasture lands once used for raising livestock including horses, sheep and cattle. The applicant has submitted plans to subdivide the property into 5 parcels all with individual well and septic systems as shown in **Appendix A – Engineered Site Plans**. HES estimated the Sites historical and proposed groundwater usage based on guidelines presented in Appendix A of Permit Sonoma's Water Use, Supply, and Conservation Assessment Guidelines (Policy and Procedure 8-2-1).

3.1 CURRENT WATER USE

3.1.1 Residential Water Usage

According to Permit Sonoma Policy 8-2-1, Appendix A, the typical water use associated with residential occupancy is between 0.2 and 0.5 acre-feet/year depending on minor landscaping. Water use for secondary residences (Additional Dwelling Units or ADUs) ranges from 0.1 to 0.25 acre-feet/year and also depends on minor or major landscaping. Additional usages such as a pool or irrigated lawns can be added to this estimate.

For the purposes of this analysis, we assumed that the Site's existing residence has historically been occupied with moderate landscaping. Therefore, the existing residential usage is estimated as:

1 (primary residence) x 0.5 acre-feet/year (residential & landscape water use) =
0.5 acre-feet/year = Historical Residential Water Use

3.1.2 Livestock Water Use

Currently the pasture land at the site is fallow, however, review of aerial photography shows that the Site was a former cattle ranch, with about 15 acres of pasture land. According to Permit Sonoma Policy 8-2-1, Appendix A, the typical water use associated with livestock (sheep or cows) is 0.05 acre-feet/acre/year. Therefore, the livestock usage can be estimated as:

15 acres (used for livestock) x 0.05 acre-feet/acre (livestock water usage rate) =
0.75 acre-feet/year = Historical Livestock Water Use

3.1.3 Pasture Irrigation

From review of aerial photography, it appears that most of the Site consisted of unirrigated pasture land. However, a small, approximately ½ -1-acre portion of the Site appears to have historically been irrigated either for grazing or for hay production. According to the Permit Sonoma Policy 8-2-1, Appendix A, the typical water use associated with irrigated pasture is 0.05 acre-feet per acre per year. Therefore, the pasture irrigation can be estimated as:

3/4-acre (historical pasture irrigation) x 3.6 acre-feet/acre/year (pasture irrigation rates) =
2.7 acre-feet/year = Historical Pasture Irrigation Water Use

3.1.4 Total Historical Water Use

Water use at the Site has included domestic, livestock watering, and irrigated pastures and based on the assessments presented above, the Sites total historical water use can be estimated as:

0.5 acre-feet/year (residential usage) + 0.75 acre-feet/year (livestock usage) +
2.7 acre-feet/year (irrigated pastures) =
3.95 acre-feet/year = Total Historical Site Water Use

3.2 PROPOSED SUBDIVISION WATER USE

The applicant has submitted plans to subdivide the property into 5 parcels ranging in size from 3 to 4.57-acres, each with individual well and septic systems as shown in **Appendix A – Engineered Site Plans**. As discussed in Section 3.1.1, the typical water use associated with residential occupancy is between 0.2 and 0.5 acre-feet/year depending on minor landscaping. Secondary residences (ADU) water use ranges from 0.1 to 0.25 acre-feet/year and also depends on minor or major landscaping. Additional usages such as a pool or irrigated lawns can be added to this estimate, but are not relevant in this case. Therefore, for the purposes of this analysis, we will make the conservative estimate that all 5 of the proposed Site parcels will be developed with a primary residence and an ADU with a total usage rate of 0.75 acre-feet/year/parcel.

5 (primary residences) x 0.5 acre-feet/year + 5 (ADU's) x 0.25 acre-feet/year =
3.75 acre-feet/year = Total Proposed Subdivision Water Use

The anticipated water use associated with the proposed subdivision appears to be consistent with historical water uses onsite. This proposed water usage rate averages 0.21 acre-feet/acre (3.75 acre-feet / 17.85 acres), which is a slight decrease from the estimated 0.22 acre-feet/acre historical water use estimate. Assuming a constant yearly water usage rate, the daily usage would be 670 gallons/day/parcel (0.75acre-feet/year/365 days) or 0.46 gpm continuously from each well.

4.0 SURROUNDING AREA WATER USAGE

HES reviewed available water well records obtained from Permit Sonoma and California DWR and assessed information obtained from peer-reviewed scientific publications as referenced in this report to determine the water usage for the surrounding area.

HES identified 16 properties that border the proposed subdivision as shown on **TABLE 1- Surrounding Site Properties**. All of the properties surrounding the Site are zoned as Rural Residential (RR) with 3-acre density. Zoning in this area is unlikely to change significantly so future development is anticipated to be consistent with currently allowed conditions. All of the neighboring properties are listed as being within the groundwater availability Class 1 or Class 2 areas.

TABLE 1 SURROUNDING SITE PROPERTIES

Item Number	APN	Address(s)	Acres	Zoning Code	Assessor Use Code
1	021-110-012	4880 Bodega Ave	10	RR 3	Rural Res/vacant Homesite
2	021-110-068	4850 Bodega Ave	5.01	RR 3	Rural Res/manufactured Home
3	021-110-039	4808 Bodega Ave	1.78	RR 3	Rural Res/Single Residence
4	021-110-044	4780 Bodega Ave	6.49	RR 3	Rural Res/2 Or More Res
5	021-110-060	261 Monte Vista Lane	5.69	RR 3	Rural Res/Single Residence
6	021-110-061	271 Monte Vista Lane	2.27	RR 3	Rural Res/Single Residence
7	021-110-071	270 Monte Vista Lane	1.92	RR 3	Rural Res/Single Residence
8	021-110-071	280 Monte Vista Lane	1.95	RR 3	Rural Res/Single Residence
9	021-100-025	300 Monte Vista Lane	4.79	RR 3	Rural Res/Single Residence
10	021-100-026	316 Monte Vista Lane	2.33	RR 3	Rural Res/Single Residence
11	021-100-024	362 Monte Vista Lane	1.5	RR 3	Rural Res/Single Residence
12	021-100-046	366 Monte Vista Lane	1.09	RR 3	Rural Res/Single Residence
13	021-100-045	368 Monte Vista Lane	1.24	RR 3	Rural Res/Single Residence
14	021-100-071	309 Kuck Lane	2.94	RR 3	Rural Res/Single Residence
15	021-100-072	309 Kuck Lane	5.64	RR 3	Rural Res/Single Residence
16	021-110-014	4893 Bodega Ave	15	RR 3	Rural Res/Single Residence

Of the 16 properties that surround the site, 14 contain a single rural residence (no permitted ADU's), one is a vacant homesite (potential for development into a residence), and one parcel is zoned for 2 or more residences. From Google Earth the parcel with multiple residences (021-110-044) appears to have two primary residences. Therefore, the surrounding properties contain a total of 16 residences, with the potential for an additional primary residence, and 16 ADU's.

As discussed in Section 3.1.1, the typical water use associated with residential occupancy is between 0.2 and 0.5 acre-feet/year. Water use for ADU's ranges from 0.1 to 0.25 acre-feet/year depending on minor or major landscaping. The surrounding properties listed on Table 1 comprise a total of 69.64 acres. Therefore, water use in the area can be calculated as:

16 (primary residences) x 0.5 acre-feet/year =
8.0 acre-feet/year = Surrounding Property Existing Water Demand

and,

16 (potential ADU's) x 0.25 acre-feet/year + 1 (primary residence) x 0.5 acre-feet/year =
4.5 acre-feet/year = Surrounding Property Future Water Demand

So,

8 acre-feet/year (existing demand) x 4.5 acre-feet/year (future increased demand) =
12.5 acre-feet/year = Total Future Potential Water Demand for Surrounding Properties.

The estimated water usage rate for the future potential development of the surrounding properties is 0.18 acre-feet/acre (12.5-acre-feet/69.64-acres) which is fairly consistent with the proposed water usage rate calculated for the minor subdivision of the Site (0.21 acre-feet/acre). This estimate assumes that the surrounding properties are solely residential and that no livestock watering or pasture irrigation occurs.

4.1 DOMESTIC WELL INFORMATION

HES reviewed the DWR Well Completion Report (WCR) database, performed a site reconnaissance, reviewed permit history, and surveyed aerial photography for the surrounding area to determine the locations of nearby groundwater wells. A total of 16 parcels surround the Site and it is assumed each residence has at least one domestic well. Locations of all the wells identified are shown on **Plate 3 - Site Plan with Well Locations**.

Well construction and yield information were identified for eleven (11) wells as shown on **Table 2 – Well Inventory**. The WCR's reviewed for this Assessment are presented in **Appendix C – Well Completion Reports.**

TABLE 2 WELL INVENTORY

APN/Well Number	Year	Distance to Site Well (feet)	Surface Elevation (feet, MSL)	Total Well Depth (feet)	Screen Interval/ (feet)	Total Screen Thickness (feet)	Well Yield (gpm)	Draw-down (feet)	Specific Capacity (gpm/feet)	Well Map #
021-110-012/ E0323807	2016	550	78	280	180-270	90	30	NA	NA	1
021-110-044/ 398372	1992	635	88	220	150-215	65	30	125	0.24	2
021-110-064/ 066873	1985	753	97	245	216-245	29	15	135	0.11	3
021-110-064/ 235200	1983	766	99	288	128-288	160	10	155	0.06	4
021-110-080/ 066831	1983	808	103	225	187-225	38	25	97	0.26	5
021-110-061/ 094447	1981	978	111	221	199-221	22	20	NA	NA	6
021-110-063/ 239929	1983	1,708	143	300	240-300	60	15	NA	NA	7
021-100-025/ 62719	1961	1,846	167	188	25-188	163	10	40	0.25	8
021-100-045/ 15443	1972	2,018	233	231	180-200 220-230	30	20	120	0.17	9
021-100-041/ 15440	1972	2064	234	241	180-200 220-240	40	20	125	0.16	10
021-100-046/ 15442	1972	2,142	237	245	189-209 229-244	35	20	105	0.19	11
Average Well Total Depth = 244 feet NA = not available				Average Screen Thickness = 66.5 feet Average Well Yield = 19.5 gpm				Average SC = 0.18 gpm/ft		

Based on review of the WCR's for the area, the average well depth is 244 feet, the average well screen is 66.5 feet, the average pumping rate is 19.5 gpm, and the average specific capacity (SC) is 0.18 gpm/foot drawdown. The maximum reported pumping rate is 30 gpm and the lowest is 10 gpm. HES estimates that each subdivision lot would require a continuous pumping rate of 0.46 gpm to supply water to a primary residence and an ADU.

During a Site inspection performed on April 18, 2024, HES staff measured the depth to water in the existing 5-inch diameter PVC cased well at 10.4 feet from the top of well casing. The total well depth was measured to be approximately 117 feet, however no additional well construction details were available for the Site well. WCR's for the area show that water bearing zones are mainly composed of blue, brown and yellow sandstone (often with shells), and interbedded with sandy clay, typical of the Wilson Grove Formation.

4.2 POTENTIAL IMPACTS TO NEIGHBORING

To evaluate potential well pumping impacts to wells on other properties, the potential lateral extent of pumping from a future domestic well on each of the subdivision lots was estimated. Using general relationships discussed in Driscoll (1986)[11], we estimated the lateral pumping influence using averages from the Well Completion Reports found in the area (**Table 2 – Well Inventory**).

Transmissivity was estimated for an unconfined aquifer, using the relationship of Specific Capacity (yield/drawdown) x the coefficient of 1,500 (unconfined aquifer)[12]. To develop the slope of the drawdown curve from the pumping well, the value of Δs (drawdown over one log graph cycle) was calculated for a distance-drawdown relationship, where $T = 528Q/\Delta s$ [13] . To estimate drawdown in the site well when pumping at 19.5 gpm (average from area wells) we used the average specific capacity (SC=0.18) from **Table 2 – Well Inventory**.

Using this data and applying it to a new well from one of the subdivisions lots, we calculated that a 6-inch diameter well (which is typical of a domestic well) would have a zone of pumping influence extending approximately 180 feet, as shown on the distance drawdown plot for an unconfined aquifer **Appendix C - Radius of Pumping Influence**. There are no offsite wells identified within 180 feet of the existing Site well and there appears to be adequate space on the proposed parcels to avoid any significant well interference.

[11] Groundwater and Wells, Second Edition, Fletcher G. Discoll, 1986, published by Johnson Division, St. Paul Minnesota, 1089p.
[12] Groundwater and Wells, Second Edition, Fletcher G. Discoll, 1986, published by Johnson Division, St. Paul Minnesota, (Appendix 16D)
[13] Groundwater and Wells, Second Edition, Fletcher G. Discoll, 1986, published by Johnson Division, St. Paul Minnesota, 1089p. (Equation 9.11)

5.0 WATER BALANCE INFORMATION

The USGS and DWR studies that included the Petaluma area provided water balance information that HES used to assess groundwater sustainability at the Site.

5.1 GROUNDWATER STORAGE

HES used well log information from eleven (11) wells to estimate the aquifer thickness using the average screened interval 66.5 feet (**Table 2 – Well Inventory**) in this area. A 2013 USGS study in the nearby Santa Rosa Plain estimated the average specific yield of the Santa Rosa Basin at 5 percent (0.05)[14]. Therefore, using this data, the aquifer storage can be estimated as follows:

66.5 feet (Aquifer Thickness) x 0.05 (Specific Yield) x 17.85 (Site Area) =
59.35 acre-feet = Estimated Aquifer Storage Onsite

5.2 PRECIPITATION

Precipitation, primarily as rainfall is the major source of inflow to the Petaluma Valley Watershed. The average rainfall for Petaluma from 30 years of data (1981 to 2010) is about 26.65 inches per year (about 2.22 feet per year)[15]:

2.22 feet/year (Regional Precipitation) x 17.85 acres (Site Area) =
39.63 acre-feet/year = Annual Onsite Precipitation

5.3 GROUNDWATER RECHARGE

Groundwater recharge is the replenishment of an aquifer with water from the land surface. It is usually expressed as an average rate of inches of water per year, similar to precipitation. Thus, the volume of recharge is the rate times the land area under consideration times the time period, and is usually expressed as acre-feet per year. In addition to precipitation, other sources of recharge to an aquifer are stream and lake or pond seepage, irrigation return flow (both from canals and fields), inter-aquifer flows, and urban recharge (from water mains, septic tanks, sewers, drainage ditches).

For this Site, the Wilson Grove aquifer is unconfined to semi-confined. The primary sources of groundwater recharge are infiltration of precipitation, infiltration from streams, and irrigation-return flow. Soil types and land cover within the watershed affect the extent and magnitude of storm water runoff (retention and infiltration). It is likely that a portion of the rain water falling directly on the site infiltrates the ground surface and migrates downward through the soil matrix and until it recharges the aquifer.

To estimate the groundwater recharge within the Site HES first assumed that the recharge to the aquifer is primarily through rainfall and that all rainfall accumulated within the 17.85-acre Site

[14] Hydrologic and Geochemical Characterization of the Santa Rosa Plain Watershed, Sonoma County, California, U.S. Geological Survey, Scientific Investigations Report 2013–5118.
[15] https://rainharvestcalculator.com/Rainfall/CA/Petaluma/94954

drains to the creek proximate to the Site. However, this estimate does not account for surface run-off, stream underflow, and evapotranspiration. To estimate the percentage of rainfall that contributes to recharge of the aquifer, HES reviewed available groundwater studies including the Santa Rosa Plain Watershed Groundwater Management Plan, and the USGS Scientific Investigation Report 2006-51157, as well as other regional groundwater studies in Sonoma County. Estimates for recharge found in these documents are considered to be reliable for our site evaluation. Average recharge to the ground-water system for the entire Santa Rosa Plain, including mountainous zones, is derived from an estimated average of 531,000 acre-ft of precipitation falling within the entire watershed. After accounting for runoff (188,400 acre-feet/year) and evapotranspiration (262,000 acre-feet/year), the amount of water available for recharging the Santa Rosa Plain Watershed equates to 80,600 acre-ft/year or approximately 15.2% of the annual rainfall. However significant variations to this value can occur based on topography, soil infiltration rates, geology etc.; and according to these USGS and Sonoma County Water Agency Reports, the long-term average precipitation that recharges groundwater can be as low as 1.67%.

While these USGS studies are not specific to the site vicinity, the average long-term recharge to the aquifer in this area likely falls within the ranges seen in the nearby watersheds. HES estimates that approximately 15% of rainfall likely contributes to groundwater recharge in this area. Based on this recharge value we can re-calculate the groundwater recharge using the following data and equation.

> 39.63 acre-feet/year (annual precip.) x 0.15 (estimated long term recharge average) =
> **5.94 acre-feet/year = Average Annual Aquifer Recharge Onsite**

6.0 CONCLUSIONS AND RECOMMENDATIONS

The Site is located in the Petaluma Creek Watershed and partially within the Petaluma Valley Groundwater Basin (a medium priority basin). The Wilson Grove aquifer beneath the Site is generally a good groundwater producer and approximately ½ of the Site is within the Sonoma County Class 1 with the other ½ within a Class 2 groundwater availability area. The wells identified within the area have an average yield of 19.5 gpm and specific capacity of 0.18. Each subdivision lot will only require the equivalent of 0.46 gpm pumping continuously to provide water for one primary and one secondary residence.

For this project the estimated aquifer thickness (66.5 feet) and the Site area (17.85 acres) can be used to estimate an aquifer storage of 59.35 acre-feet. Based on annual precipitation and estimated aquifer recharge rates, the annual recharge to the aquifer is estimated to be 5.94 acre-feet. The estimated annual water demand for the proposed subdivision is 3.75 acre-feet or 0.21 acre-feet/acre/year. The anticipated water usage rate is also fairly consistent with usage rate estimates for the surrounding properties.

In summary:

19.5 gpm	average well pumping rate in this area
0.46 gpm	required continuous pumping rate for each subdivision lot.
3.75 ac-ft	estimated annual water demand for the entire subdivision
0.75 ac-ft	estimated annual water demand for an individual lot
0.21 ac-ft	average annual groundwater usage per Site acre
39.63 ac-ft	annual precipitation
59.35 ac-ft	estimated aquifer storage
5.94 ac-ft	estimated annual recharge to aquifer

Based on the assumptions and estimates presented in this report, the quantity of groundwater to be used for the project and surrounding properties compared to the quantity of available groundwater indicates that the Projects anticipated water use is unlikely to result in significant declines in groundwater resources over time. Based on the findings of this report, groundwater extraction at the proposed well locations will not significantly impact neighboring wells or stream flow conditions in nearby creeks. In addition, based on the relative distance to the coastal areas, the depth of the site well and the proposed water usage rates, salt water intrusion is not considered to be a concern to this Assessment.

7.0 LIMITATIONS

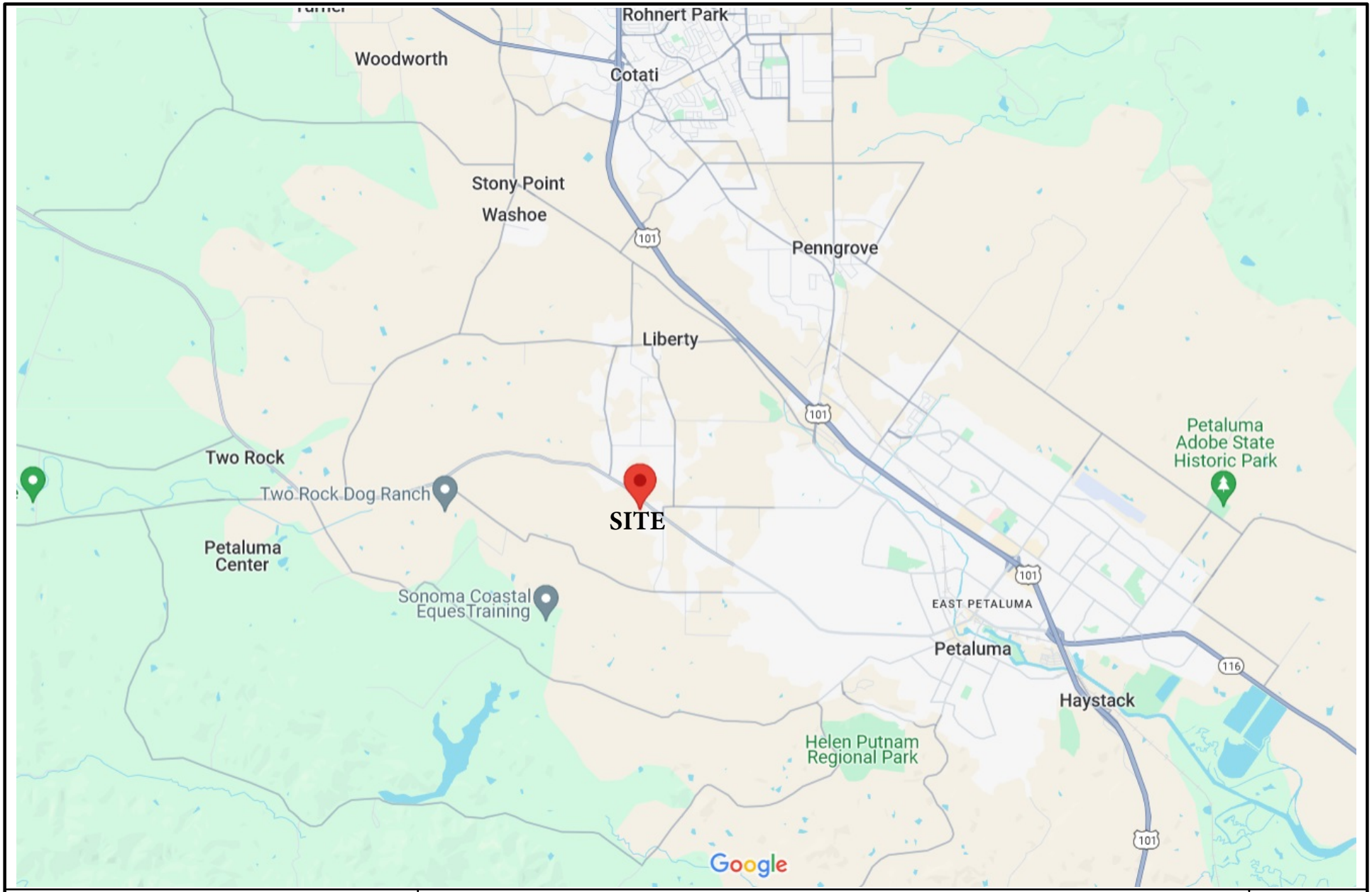
HES is not responsible for the independent conclusions, opinions or recommendations made by others based on the records review, site inspection, field exploration, laboratory test data and interpretations presented in this report.

Groundwater systems of Sonoma County are typically complex, and available data rarely allows for more than general assessment of groundwater conditions and delineation of aquifers. Hydrogeologic interpretations are based on the drillers' reports made available to us through the California Department of Water Resources, available geologic maps and hydrogeologic studies and professional judgment. This analysis is based on limited available data and relies significantly on interpretation of data from disparate sources of disparate quality.

It should be noted that hydro-geological assessments are inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and site evaluation. Additionally, the passage of time may result in a change in the environmental characteristics at this site and surrounding properties. This report does not warrant against future operations or conditions, nor does this warrant operations or conditions present of a type or at a location not investigated.

This study is not intended to assess if any soil contamination, waste emplacement, or groundwater contamination exists by subsurface sampling through the completion of soil borings and the installation of monitoring wells. The scope of work, determined by the client, did not include these activities.

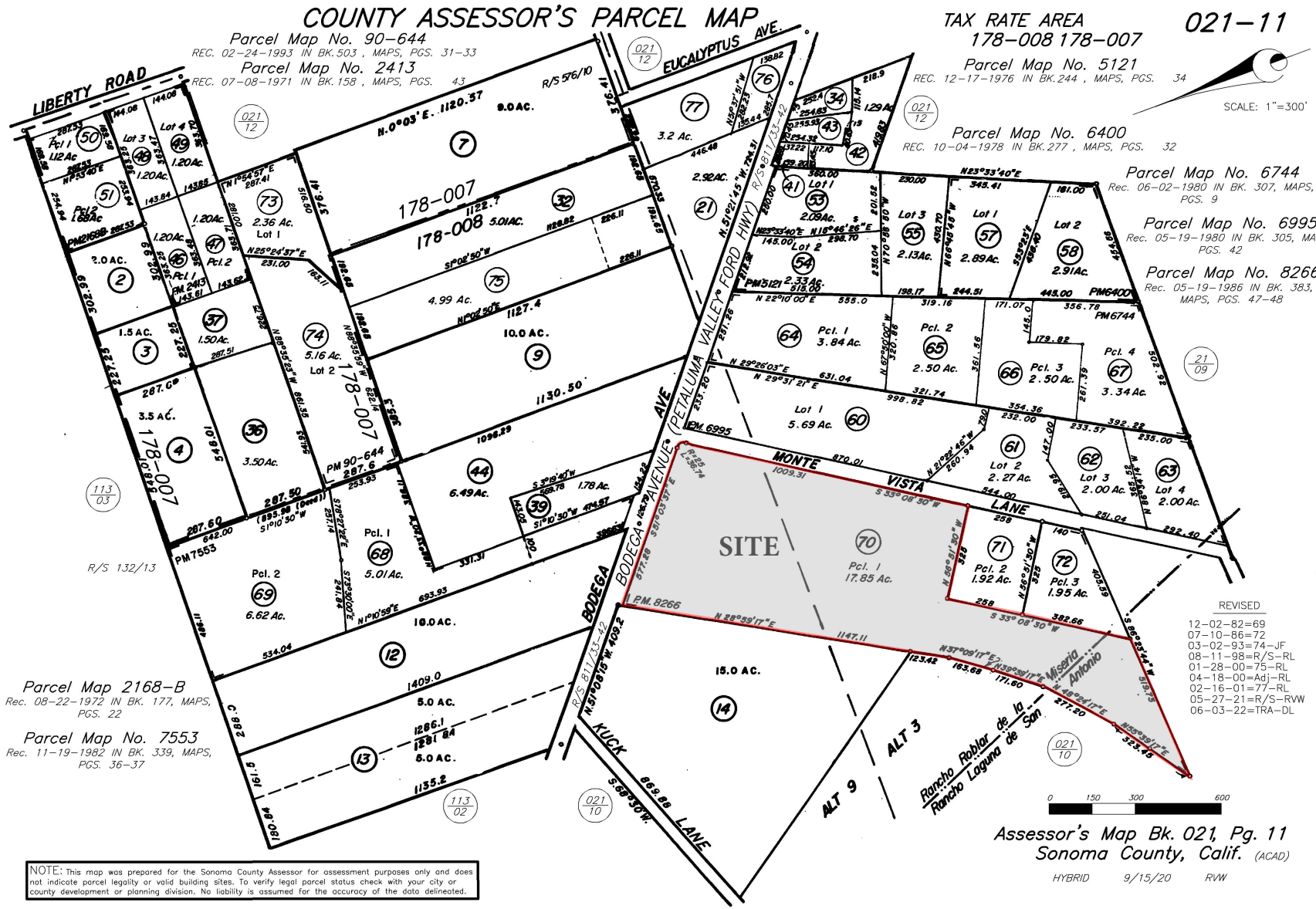
This Report is for the exclusive use of Mr. Rick Young, LPL Investments LLC, their affiliates, designates and assignees and no other party shall have any right to rely on any service provided by Hurvitz Environmental Services without prior written consent.



HURVITZ ENVIRONMENTAL
105 MORRIS ST, STE 188
SEBASTOPOL, CA 95472
PH: 707.824.1690
FX: 707.824.2675
HURVITZ.ENVIRONMENTAL@GMAIL.COM
CA PG# 7573

Site Location Map
4825 Bodega Ave
Petaluma, CA

JOB NUMBER: **5259.01**
DATE: **04/25/24**
PLATE: **1**



Parcel Map 2168-B
Rec. 08-22-1972 IN BK. 177, MAPS, PGS. 22

Parcel Map No. 7553
Rec. 11-19-1982 IN BK. 339, MAPS, PGS. 36-37

NOTE: This map was prepared for the Sonoma County Assessor for assessment purposes only and does not indicate parcel legality or valid building sites. To verify legal parcel status check with your city or county development or planning division. No liability is assumed for the accuracy of the data delineated.

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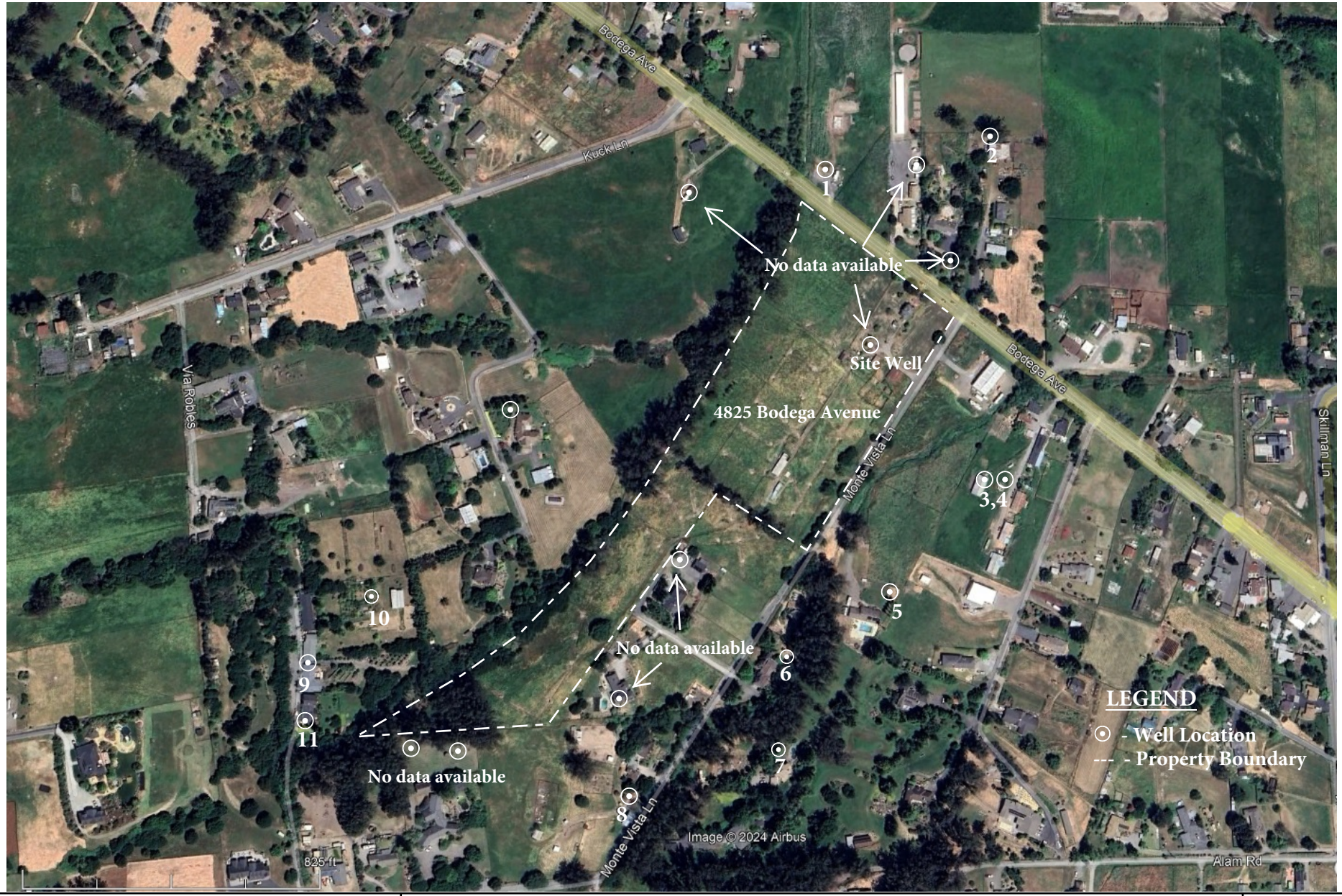
CA PG# 7573

Assessor's Parcel Map

4825 Bodega Ave
Petaluma, CA

JOB NUMBER: 5259.01
DATE: 04/25/24
PLATE: 2



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CA PG# 7573

Site Plan with Well Locations

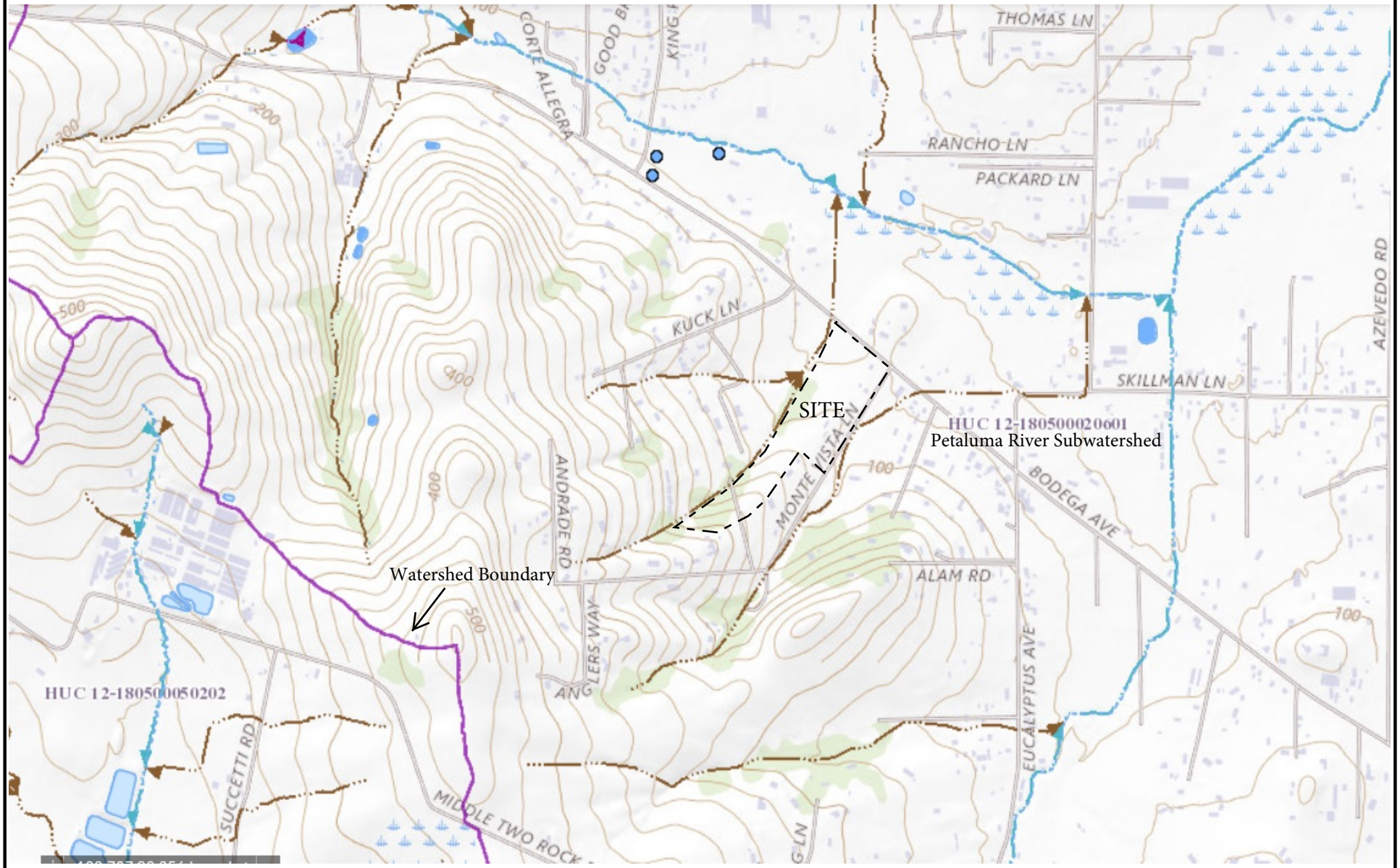
4825 Bodega Ave

Petaluma, CA

JOB NUMBER: 5259.01

DATE: 04/25/24

PLATE: 3



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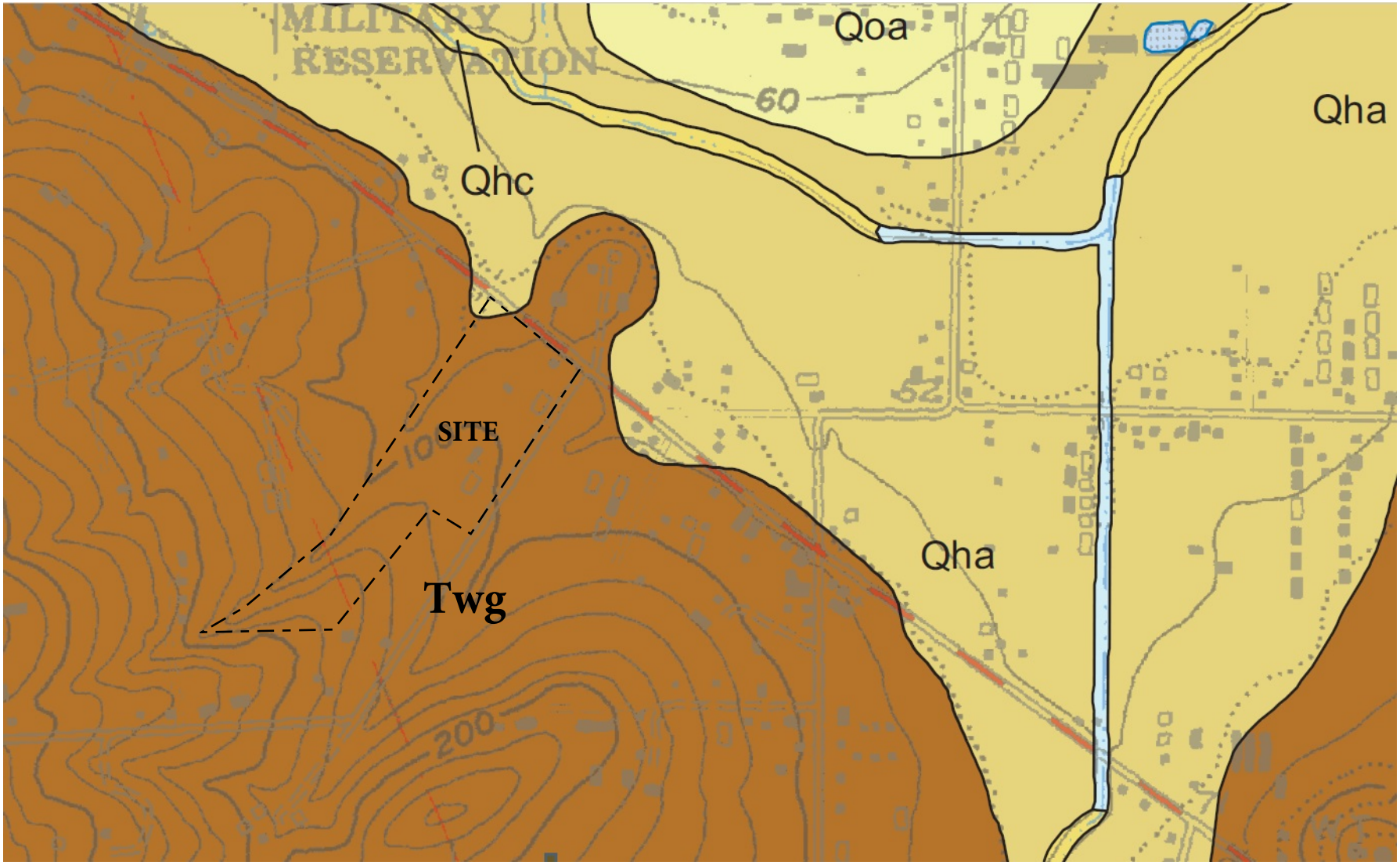
CA PG# 7573

Topographic Map

4825 Bodega Ave
Petaluma, CA

JOB NUMBER: 5259.01
DATE: 04/25/24
PLATE: 4



Source: Geologic Map of the Cotati 7.5' Quadrangle Sonoma County, CA Digital Database Version 1.0, 2013.

Twg - Wilson Grove Formation (late Miocene) - Light gray to light yellow-brown marine sandstone.
Qha - Alluvium (Holocene) Sand, gravel, silt, and clay that are poorly sorted.
Qoa - Alluvium (Early to late Pleistocene) Stream terrace, basin, and channel deposits.

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Geologic Map

4825 Bodega Ave
Petaluma, CA

JOB NUMBER: **5259.01**
DATE: **04/25/24**
PLATE: **5**

APPENDIX A
SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

Photo 1: View of existing residence located at the north end of the Site.

Photo 2: View of existing barns onsite.

SITE PHOTOGRAPHS

Photo 3: View of the existing well onsite.

Photo 4: View north of pasture land located west of the residence.

SITE PHOTOGRAPHS

Photo 5: View south looking up hill and the southern pasture area onsite.

Photo 6: View northerly from the Sites southern boundary.

Photo 7: View of ephemeral drainage that borders the Site to the west.

APPENDIX B
ENGINEERED SITE PLAN

TENTATIVE PARCEL MAP

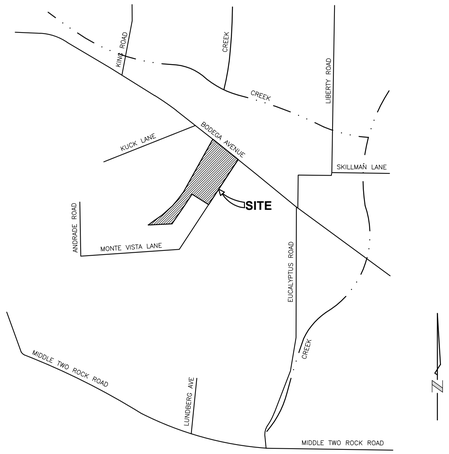
FOR THE

LANDS OF LPL INVESTMENTS, LLC

4825 BODEGA AVENUE
APN 021-110-070
PETALUMA CALIFORNIA

PROJECT DATA

SITE DATA:	4825 BODEGA AVE PETALUMA, CALIFORNIA APN 021–110–070
ZONING:	AR B6 3 SR
LAND USE:	RR 3
TOTAL ACREAGE:	17.86± ACRES (778,151± S.F) GROSS
TOTAL PARCELS:	5
PARCEL 1:	4.30± ACRES (187,188± S.F.)
PARCEL 2:	3.00± ACRES (130,696± S.F.)
PARCEL 3:	3.00± ACRES (130,690± S.F.)
PARCEL 4:	3.00± ACRES (130,687± S.F.)
DESIGNATED REMAINDER:	4.57± ACRES (198,891± S.F.)



VICINITY MAP

N.T.S.

UTILITIES

FIRE PROTECTION	TWO ROCK VOLUNTEER COMPANY
WATER	PRIVATE
SEWAGE	PRIVATE

SITE DIAGRAM

SCALE: 1" = 250'

CONSULTANTS

LAND SURVEYORS CIVIL ENGINEER	STEVEN J. LAFRANCHI & ASSOCIATES, INC. 140 SECOND STREET, SUITE 312 PETALUMA, CALIFORNIA 94952 707.762.3122 VOICE 707.762.3239 FAX steve@sjla.com
ON–SITE WASTEWATER CONSULTANT	BC ENGINEERING GROUP, INC JONATHAN ERKER 2800 CLEVELAND AVE, SUITE B SANTA ROSA, CA 95403 PHONE 707.542.4321 je@bcengineeringgroup.com

OWNER/APPLICANT

RICK YOUNG C/O
LPL INVESTMENTS LLC
121 LAKEVILLE STREET
PETALUMA, CA 94952
707.763.6981 VOICE
rick@sonomamarin.com

SHEET INDEX

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STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
STEVEN J. LAFRANCHI
No. 49302
CIVIL
STATE OF CALIFORNIA

REVISIONS	BY

COVER SHEET

LANDS OF LPL INVESTMENTS, LLC
4825 BODEGA AVE APN 021-110-070
PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
CIVIL ENGINEERS ~ LAND SURVEYORS
LAND PLANNERS ~ LANDSCAPE ARCHITECTS
PETALUMA THEATRE SQUARE
140 SECOND STREET, SUITE 312
PETALUMA, CALIFORNIA 94952
(707) 762-3122 FAX (707) 762-3239

DATE:	1.23.2024
SCALE:	AS NOTED
DESIGN:	SJL
DRAWN:	DKD, DJB
CHECK:	SJL
JOB:	Young Bodega
JOB No:	232372
SHEET	TM-1
OF	4 SHEETS

LEGEND

AR B6 [RR] — ZONING DISTRICT / LAND USE CLASSIFICATION

ZONING DISTRICTS

LC	LIMITED COMMERCIAL
C1	NEIGHBORHOOD COMMERCIAL
AR B6	AGRICULTURE & RESIDENTIAL COMBINING DISTRICTS
LEA B6	LAND EXTENSIVE AGRICULTURE COMBINING DISTRICTS

LAND USE CLASSIFICATIONS

[RR]	RURAL RESIDENTIAL
[LEA]	LAND EXTENSIVE AGRICULTURE
[LC]	LIMITED COMMERCIAL
[ ]	LAND USE DESIGNATION

NOTES

1. AERIAL DATE: 2023
   SOURCE: MICROSOFT CORPORATION, MAXAR, CNES DISTRIBUTION AIRBUS DS
2. ZONING INFORMATION SHOWN HEREON IS PER THE PERMIT SONOMA ZONING AND LAND USE GIS ACTIVEMAP VIEWER.
3. LAND USE DESIGNATIONS SHOWN HEREON ARE PER THE SONOMA COUNTY GENERAL PLAN 2020 LAND USE MAP (FIGURE LU-2h).

N

NORTH

S

0 250 500 1000

GRAPHIC SCALE

PROFESSIONAL LAND SURVEYOR
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REGISTERED PROFESSIONAL ENGINEER
STEVEN J. LAFRANCHI
No. 49302
CIVIL
STATE OF CALIFORNIA

REVISIONS	BY

CONTEXT PLAN

LANDS OF LPL INVESTMENTS, LLC
4825 BODEGA AVE APN 021-110-070
PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
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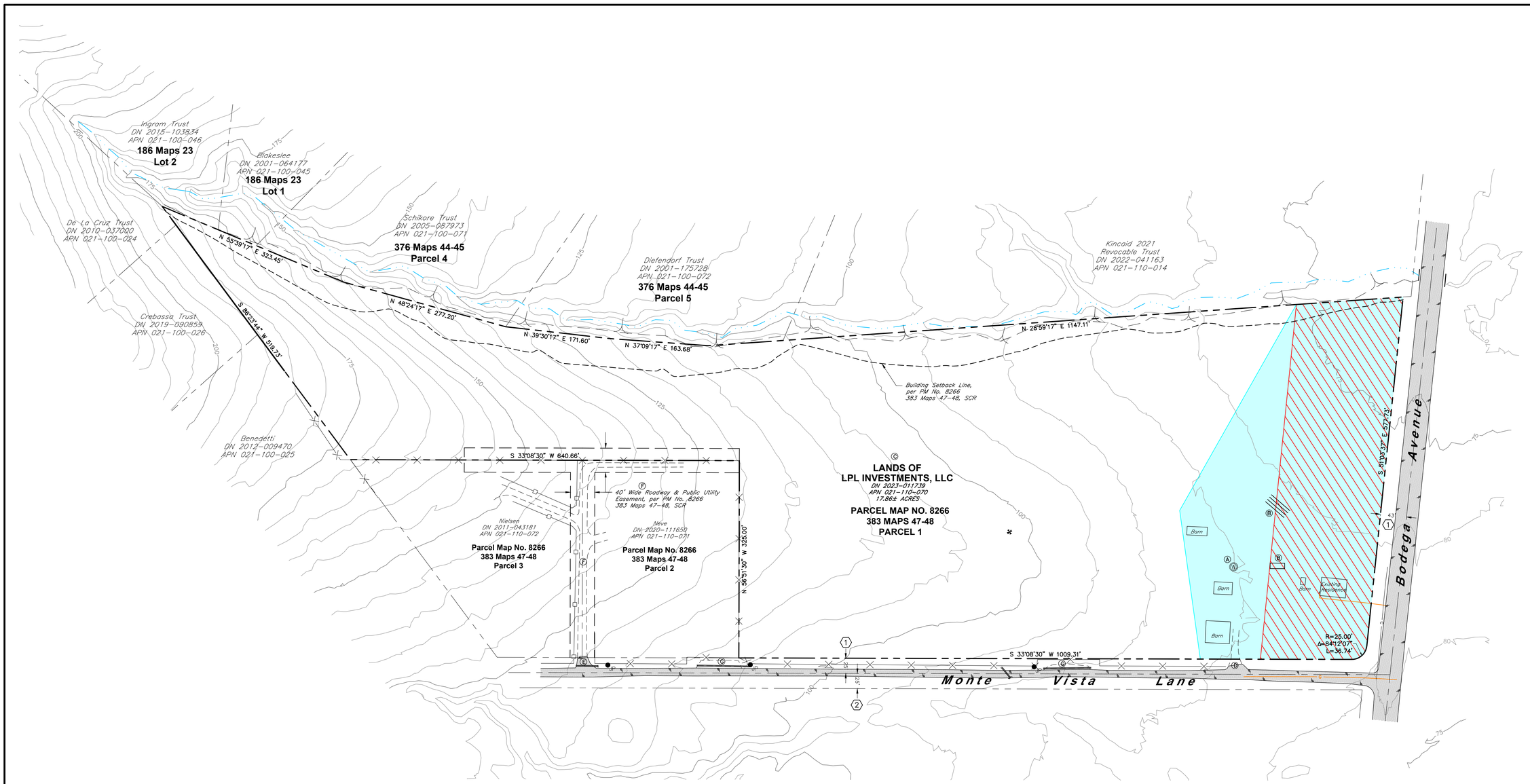
DATE: 1.23.2024
SCALE: 1"=250'
DESIGN: SJL
DRAWN: DKD, DJB
CHECK: SJL
JOB: Young Bodega
JOB No: 232372
SHEET

TM-2

OF 4 SHEETS



NOTES

1. TOPOGRAPHIC INFORMATION SHOWN HEREON, EXCEPT FOR THE CONTOUR DATA, IS BASED UPON A FIELD SURVEY PERFORMED BY STEVEN J. LAFRANCHI & ASSOCIATES, INC. IN APRIL 2023. CONTOUR DATA SHOWN HEREON IS DERIVED FROM THE SONOMA COUNTY VEGETATION MAPPING PROJECT, DATED SEPT–NOV. 2013 AND IS FOR PLANNING PURPOSES ONLY.
2. VERTICAL DATUM: NAVD 1988, PER A GNSS STATIC SURVEY PERFORMED BY STEVEN J. LAFRANCHI & ASSOCIATES, INC. IN APRIL 2023, AND POST–PROCESSED BY THE NATIONAL GEODETIC SOURVEY'S ONLINE POSITIONING USER SERVICE (OPUS). JOB BENCHMARK: SET ½" REBAR & RED CAP, STAMPED "SJLA CONTROL POINT", ELEVATION = 101.56 NAVD 1988 DATUM.
3. BOUNDARY INFORMATION SHOWN HEREON IS PER A BOUNDARY RETRACEMENT SURVEY PERFORMED BY STEVEN J. LAFRANCHI & ASSOCIATES, INC. IN APRIL 2023, WHICH HELD THE BOUNDARY PER PARCEL MAP NO. 8266.
4. THE PRELIMINARY TITLE REPORT PREPARED BY FIRST AMERICAN TITLE COMPANY UNDER ORDER NUMBER 0812022944–JJ, DATED JAN 4, 2024, WAS REVIEWED IN CONJUNCTION WITH THIS MAPPING.
5. UNDERGROUND UTILITIES WERE PLOTTED USING SURFACE EVIDENCE. UNDERGROUND UTILITIES MAY EXIST THAT ARE NOT SHOWN HEREON. UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATION AND MAY NOT BE LOCATED AS SHOWN HEREON. IT IS RECOMMENDED THAT AN UNDERGROUND UTILITY LOCATION COMPANY MARKS THE UTILITIES PRIOR TO ANY CONSTRUCTION. ONLY BY POTHOLING FOR EXISTING UTILITIES CAN THEIR LOCATION BE KNOWN.

ABBREVIATIONS

APN	ASSESSORS PARCEL NUMBER
DN	DOCUMENT NUMBER
JBM	JOB BENCHMARK
NTS	NOT TO SCALE
SCR	SONOMA COUNTY RECORDS

DOCUMENT REFERENCES

R1 PARCEL MAP NO. 8266, FILED IN BOOK 383 OF MAPS, AT PAGES 47–48, SONOMA COUNTY RECORDS.

LEGEND

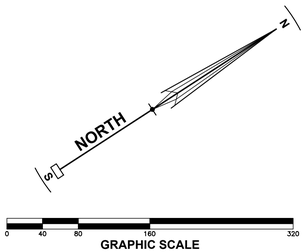
- EXISTING WELL
- JOB BENCHMARK, SEE NOTE '2'
- BOUNDARY LINE
- ADJACENT PARCEL LINE
- CENTERLINE
- EDGE GRAVEL TRAVELED WAY
- APPROXIMATE THREAD OF UN–NAMED SEASONAL CREEK
- TOP OF STREAM BANK (APPROXIMATE, PER SONOMA COUNTY VEG MAP)
- EDGE OF PAVEMENT
- BARBED WIRE FENCE
- WOOD BOARD FENCE
- EXISTING CONTOURS
- 18" CORRUGATED METAL PIPE
- STRIP OF LAND GRANTED TO THE COUNTY OF SONOMA, PER DN 1986–027020, SCR
- STRIP OF LAND GRANTED TO THE COUNTY OF SONOMA, PER DN 1980–026728, SCR

PRMD ZONING AND LAND USE DESIGNATIONS:

- PRIORITY GROUNDWATER BASIN (GSAs) ZONE 1
- SCENIC RESOURCE

KEYNOTES

- (A) EXISTING WELL
- (B) EXISTING SEPTIC AREA (TANK & FIELD) FOR A THREE BEDROOM RESIDENCE. REFER TO SEPTIC BINDER FOR ADDITIONAL INFORMATION AS PART OF THE APPLICATION SUBMITTAL PACKAGE.
- (C) COMPREHENSIVE SEPTIC TESTING HAS BEEN CONDUCTED ON THE SITE BY BC ENGINEERING GROUP, INC. REFER TO TM–4 TENTATIVE PARCEL MAP & THE SEPTIC BINDER FOR ADDITIONAL INFORMATION AS PART OF THE APPLICATION SUBMITTAL PACKAGE.
- (D) EXISTING DRIVEWAY APPROACH TO EXISTING RESIDENCE.
- (E) EXISTING DRIVEWAY APPROACH APN 0210–110–071 AND –072 AND THE SOUTHERLY PORTION OF THE SUBJECT PROPERTY.
- (F) EXISTING 15–FOOT WIDE PRIVATE DRIVE WITHIN A 40–FOOT WIDE ROADWAY EASEMENT BENEFITING THE SUBJECT PROPERTY CONSTRUCTED IN COMPLIANCE WITH THE CONDITIONS FOR PARCEL MAP NO. 8266.
- (G) EXISTING TURNOUT CONSTRUCTED IN COMPLIANCE WITH THE CONDITIONS FOR PARCEL MAP NO. 8266.



REVISIONS	BY

EXISTING CONDITIONS EXHIBIT

LANDS OF LPL INVESTMENTS, LLC
4825 BODEGA AVE APN 021-110-070
PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
CIVIL ENGINEERS ~ LAND SURVEYORS
LAND PLANNERS ~ LANDSCAPE ARCHITECTS
PETALUMA THEATRE SQUARE
140 SECOND STREET, SUITE 312
PETALUMA, CALIFORNIA 94952
(707) 762-3122 FAX (707) 762-3239

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NO. 6368
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
STEVEN J. LAFRANCHI
No. 49302
CIVIL
STATE OF CALIFORNIA

DATE:	1.23.2024
SCALE:	1"=80'
DESIGN:	SJL
DRAWN:	DKD, DJB
CHECK:	SJL
JOB:	Young Bodega
JOB No:	232372
SHEET	TM-3
OF	4 SHEETS

TENTATIVE PARCEL MAP KEY NOTES

Ⓐ EXISTING WELL ON DESIGNATED REMAINDER TO REMAIN. THE DESIGNATED REMAINDER IS LOCATED IN ZONE 1 MAJOR GROUNDWATER BASIN.

Ⓑ EXISTING SEPTIC AREA (TANK & FIELD) FOR A THREE BEDROOM RESIDENCE. REFER TO SEPTIC BINDER FOR ADDITIONAL INFORMATION AS PART OF THE APPLICATION SUBMITTAL PACKAGE.

Ⓒ APPROXIMATE LOCATION OF PROPOSED PRIVATE ON-SITE WASTEWATER DISPOSAL SYSTEM AS PREPARED BY BC ENGINEERING GROUP, INC AND AS SHOWN IN THE GRAPHICS INCLUDED WITHIN THE SEPTIC BINDER PROVIDING COMPREHENSIVE INFORMATION AS PART OF THE APPLICATION SUBMITTAL PACKAGE.
PARCEL 1: 9 BEDROOMS
PARCEL 2: 8 BEDROOMS
PARCEL 3: 8 BEDROOMS
PARCEL 4: 7 BEDROOMS

Ⓓ PROPOSED WELL LOCATION TO BE DETERMINED. PROPOSED PARCEL IS LOCATED IN ZONE 2 MAJOR NATURAL RECHARGE AREA.

Ⓔ EXISTING DRIVEWAY ENTRANCE TO PROPOSED PARCEL 1. THE DRIVEWAY ENTRANCE SHALL BE RECONSTRUCTED TO CONFORM TO AASHTO AND COUNTY OF SONOMA STANDARDS. THE PROPOSED WORK IS WITHIN THE PUBLIC RIGHT OF WAY OF MONTE VISTA LANE AND WILL REQUIRE REVIEW, APPROVAL AND CONSTRUCTION UNDER ENCROACHMENT PERMIT PROCESS.

Ⓕ THE EXISTING PRIVATE DRIVEWAY SERVING TWO EXISTING PROPERTIES (APN 021-110-071 & -072) WAS IMPROVED AND CONSTRUCTED IN CONJUNCTION WITH PARCEL MAP NO. 8266. NO IMPROVEMENTS ARE PROPOSED AS A PART OF THE LAND DIVISION AS THE EXISTING CONDITIONS HAVE BEEN CONSTRUCTED TO MEET COUNTY STANDARDS.

Ⓖ LOCATION OF A DRIVEWAY ENTRANCE FOR PROPOSED PARCELS 2, 3 & 4 SHALL BE DETERMINED AT THE TIME OF THE PARCEL SPECIFIC DEVELOPMENT AND BE INCLUDED AS PART OF THAT FUTURE PERMIT TO ALLOW THE MAXIMUM FLEXIBILITY TO DETERMINE A FUTURE RESIDENCE LOCATION ON THE SITE. NO DESIGN AND/OR CONSTRUCTION IS PROPOSED AS PART OF THE LAND DIVISION.

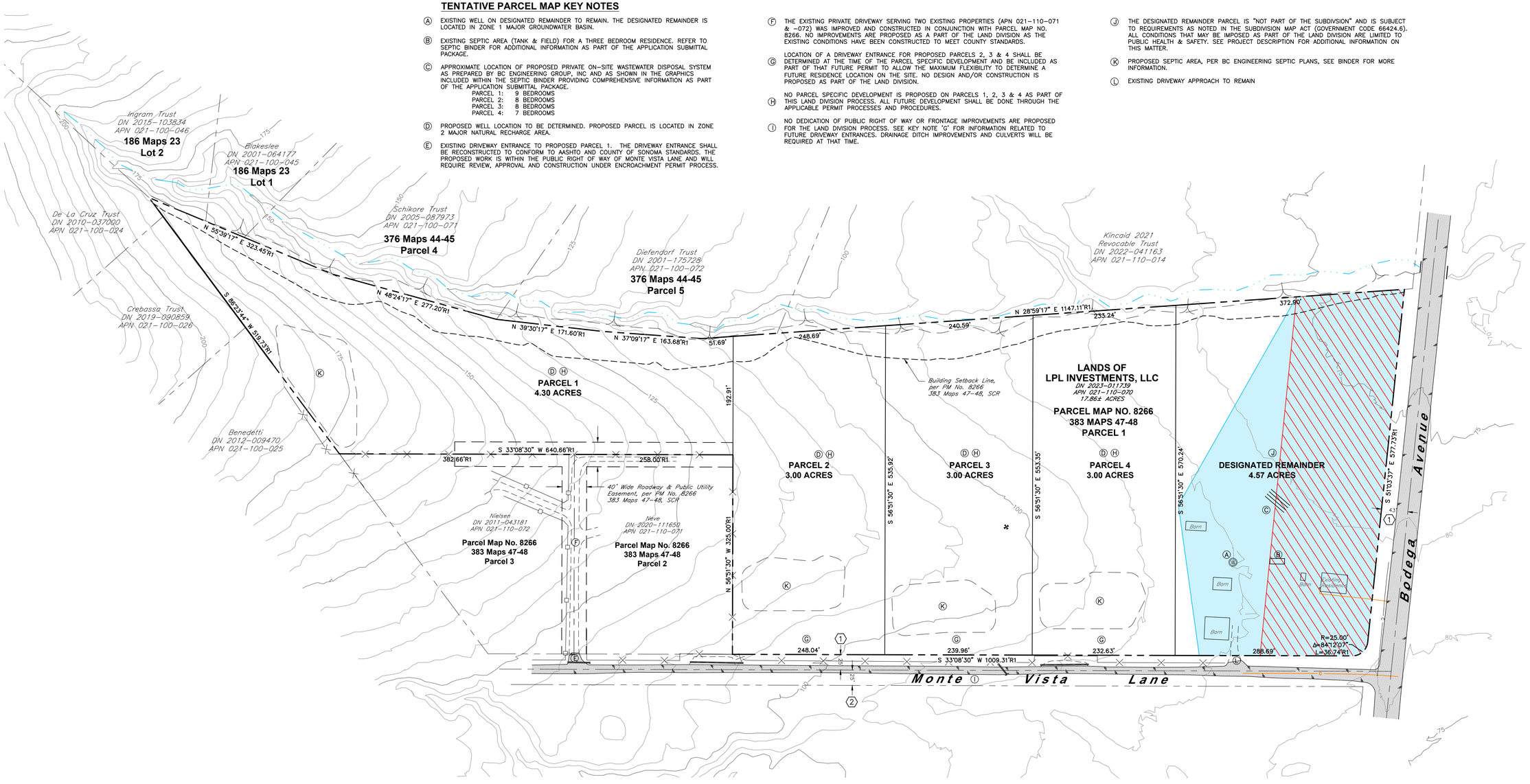
Ⓗ NO PARCEL SPECIFIC DEVELOPMENT IS PROPOSED ON PARCELS 1, 2, 3 & 4 AS PART OF THIS LAND DIVISION PROCESS. ALL FUTURE DEVELOPMENT SHALL BE DONE THROUGH THE APPLICABLE PERMIT PROCESSES AND PROCEDURES.

Ⓘ NO DEDICATION OF PUBLIC RIGHT OF WAY OR FRONTAGE IMPROVEMENTS ARE PROPOSED FOR THE LAND DIVISION PROCESS. SEE KEY NOTE 'G' FOR INFORMATION RELATED TO FUTURE DRIVEWAY ENTRANCES. DRAINAGE DITCH IMPROVEMENTS AND CULVERTS WILL BE REQUIRED AT THAT TIME.

Ⓙ THE DESIGNATED REMAINDER PARCEL IS "NOT PART OF THE SUBDIVISION" AND IS SUBJECT TO REQUIREMENTS AS NOTED IN THE SUBDIVISION MAP ACT (GOVERNMENT CODE 66424.6). ALL CONDITIONS THAT MAY BE IMPOSED AS PART OF THE LAND DIVISION ARE LIMITED TO PUBLIC HEALTH & SAFETY. SEE PROJECT DESCRIPTION FOR ADDITIONAL INFORMATION ON THIS MATTER.

Ⓚ PROPOSED SEPTIC AREA, PER BC ENGINEERING SEPTIC PLANS, SEE BINDER FOR MORE INFORMATION.

Ⓛ EXISTING DRIVEWAY APPROACH TO REMAIN



LEGEND

Ⓦ	EXISTING WELL
*	JOB BENCHMARK, SEE NOTE '2'
	BOUNDARY LINE
	ADJACENT PARCEL LINE
	CENTERLINE
	EDGE GRAVEL TRAVELED WAY
	APPROXIMATE THREAD OF UN-NAMED SEASONAL CREEK
	TOP OF STREAM BANK (APPROXIMATE, PER SONOMA COUNTY VEG MAP)
	EDGE OF PAVEMENT
	BARBED WIRE FENCE
	WOOD BOARD FENCE
160	EXISTING CONTOURS
	18" CORRUGATED METAL PIPE
①	STRIP OF LAND GRANTED TO THE COUNTY OF SONOMA, PER DN 1986-027020, SCR
②	STRIP OF LAND GRANTED TO THE COUNTY OF SONOMA, PER DN 1980-026728, SCR
	PRMD ZONING AND LAND USE DESIGNATIONS:
	PRIORITY GROUNDWATER BASIN (GSAs) ZONE 1
	SCENIC RESOURCE

NOTES

1. INFORMATION SHOWN ON THIS EXHIBIT/MAP IS FOR PLANNING PURPOSES ONLY IN SUPPORT OF A TENTATIVE PARCEL MAP APPLICATION. REFER TO PROJECT DESCRIPTION & SUPPORTING BINDERS FOR ADDITIONAL INFORMATION.
2. SEE TM-3 EXISTING CONDITIONS EXHIBIT FOR ADDITIONAL INFORMATION.

ABBREVIATIONS

APN	ASSESSORS PARCEL NUMBER
DN	DOCUMENT NUMBER
JBM	JOB BENCHMARK
NTS	NOT TO SCALE
SCR	SONOMA COUNTY RECORDS

DOCUMENT REFERENCES

R1 PARCEL MAP NO. 8266, FILED IN BOOK 383 OF MAPS, AT PAGES 47-48, SONOMA COUNTY RECORDS.

NORTH

GRAPHIC SCALE
0 40 80 160 320

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STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
STEVEN J. LAFRANCHI
No. 49302
CIVIL
STATE OF CALIFORNIA

REVISIONS	BY

TENTATIVE PARCEL MAP

LANDS OF LPL INVESTMENTS, LLC
4825 BODEGA AVE APN 021-110-070
PETALUMA CALIFORNIA

STEVEN J. LAFRANCHI & ASSOCIATES, INC.
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LAND PLANNERS - LANDSCAPE ARCHITECTS
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140 KENTUCKY STREET, SUITE J-2
PETALUMA, CALIFORNIA 94952
(707) 762-3122 FAX (707) 762-3239

DATE: 1.23.2024
SCALE:
DESIGN: SJL
DRAWN: DKD, DJB
CHECK: SJL
JOB: Young Bodega
JOB No: 232372
SHEET

TM-4

OF 4 SHEETS

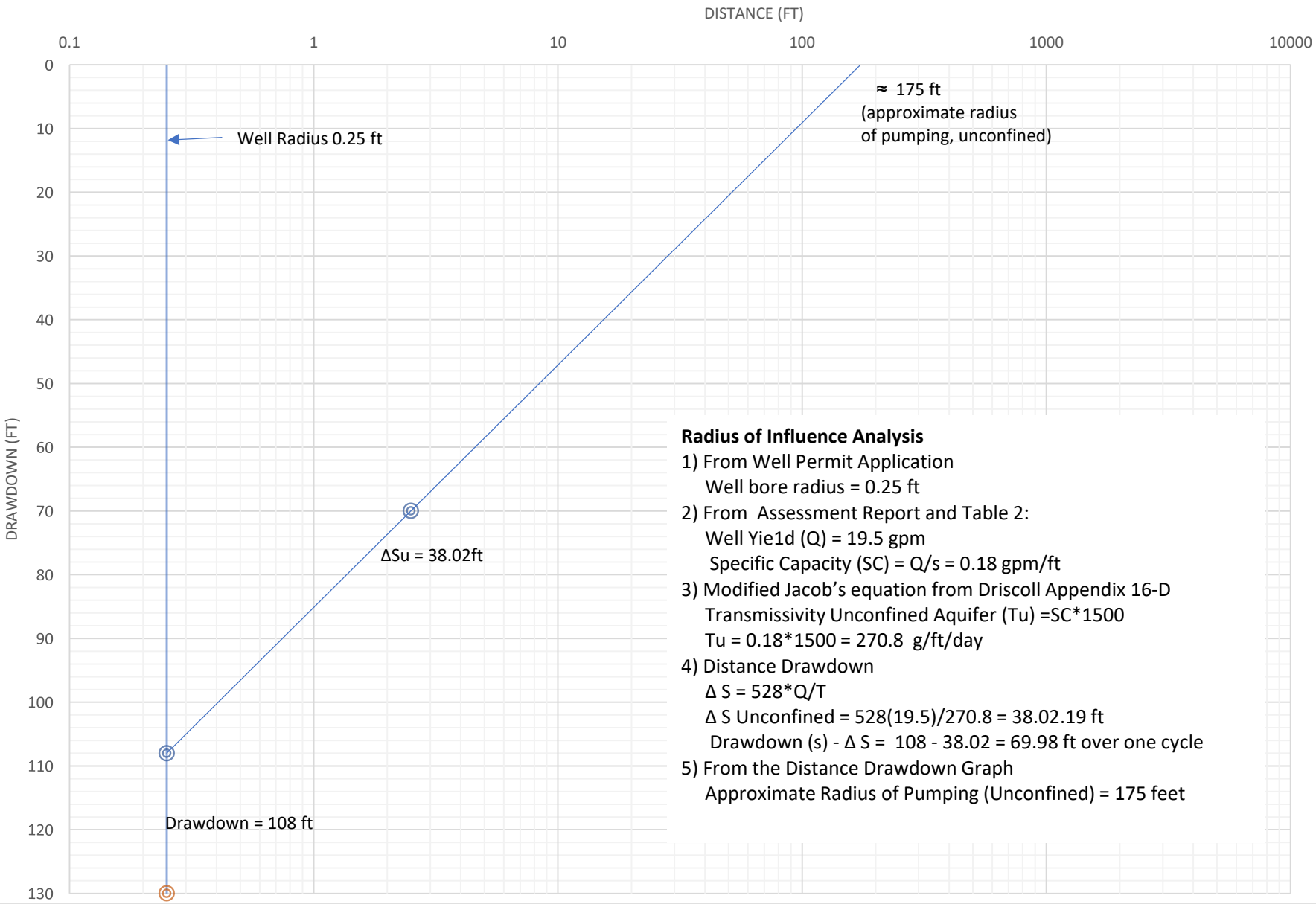
APPENDIX C
WELL COMPLETION LOGS

Well Completion Logs are on file with Permit Sonoma.
Please contact the Project Planner, Mark Shurvinton, for more information

APPENDIX D
RADIUS OF PUMPING INFLUENCE

Appendix C- Radius of Pumping Influence

4825 Bodega Avenue, Petaluma, CA
APN 021-110-070



Radius of Influence Analysis

1) From Well Permit Application
   Well bore radius = 0.25 ft
2) From Assessment Report and Table 2:
   Well Yie1d (Q) = 19.5 gpm
   Specific Capacity (SC) = Q/s = 0.18 gpm/ft
3) Modified Jacob's equation from Driscoll Appendix 16-D
   Transmissivity Unconfined Aquifer (Tu) =SC*1500
   Tu = 0.18*1500 = 270.8 g/ft/day
4) Distance Drawdown
   Δ S = 528*Q/T
   Δ S Unconfined = 528(19.5)/270.8 = 38.02.19 ft
   Drawdown (s) - Δ S = 108 - 38.02 = 69.98 ft over one cycle
5) From the Distance Drawdown Graph
   Approximate Radius of Pumping (Unconfined) = 175 feet