NORTHPOINT
CONSULTING GROUP, INC.

TECHNICAL MEMORANDUM

To: Lake County Community Development Department

From: Annjanette Dodd, PhD, CA PE #77756 Exp. 6/30/2025

Date: November 6, 2023

Subject: Poverty Flats Ranch
Ordinance 3106 Hydrology Report and Drought Management Plan
10535 High Valley Road, Clearlake Oaks, CA 95423 (APN: 006-004-22)

INTRODUCTION AND PURPOSE

On July 27, 2021, the Lake County Board of Supervisors passed an Urgency Ordinance (Ordinance 3106) requiring land use applicants to provide enhanced water analysis during a declared drought emergency. Ordinance 3106 requires all projects that require a CEQA analysis of water use include the following items in a Hydrology Report prepared by a licensed professional experienced in water resources:

- Approximate amount of water available for the project's identified water source,
- Approximate recharge rate for the project's identified water source, and
- Cumulative impact of water use to surrounding areas due to the project.

The purpose of this Technical Memorandum (TM) is to provide the information required by Ordinance 3106 for Osprey Farm. Ordinance 3106 also requires a Drought Management Plan depicting how the applicant proposes to reduce water use during a declared drought emergency, this plan is included as part of this TM.

PROJECT LOCATION

The project is located at 10535 High Valley Road, Clearlake Oaks, CA 95423 (APN: 006-004-22). The property area amounts to 196.7 acres, as per the Lake County Parcel Viewer web application. The cultivation area is located approximately 2.8 miles north of Clearlake Oaks and is accessed via High Valley Road, off SR 20. (Attachment 1)

PROPOSED PROJECT

The applicant, Poverty Flats Ranch, proposes to permit commercial cannabis cultivation in accordance with the Lake County Zoning Ordinance (Article 27). The proposal is for five (5) A-Type 3 outdoor licenses, three (3) A-Type 2 outdoor licenses, for a total of 247,800 sq. ft. (5.68 acres) of outdoor canopy area and 8,700 sq. ft. (0.20 acres) of ancillary greenhouse nurseries, and a Type 13 self-distribution license. The proposal includes the development of facilities appurtenant to cultivation, storage sheds, the appropriate water storage and irrigation infrastructure.

WATER SOURCE AND SUPPLY

The irrigation water source is an existing groundwater well (Lat/Long: 39.064783, -122.722353). The well was drilled in August 2022 (Attachment 2), to a depth of 400 ft below ground surface (bgs) through 23 ft brown shale and clay, 20 ft to 200 ft bgs of black shale, and 200 ft to 400 ft bgs of sandstone. Depth to first water was noted in the geologic log at 200 ft bgs, static water level was not recorded. A two hour well production test (air-lift test) at the time the well was drilled yielded 40 gpm.

IRRIGATION METHOD AND WATER STORAGE

The project proposes to use the existing groundwater well to fill twenty-five (25) 3,000-gallon water tanks and one (1) 4,000-gallon water storage tank adjacent to the proposed cultivation areas, amounting to a total of 79,000-gallons of storage (Attachment 1). Water from the storage tanks will be piped to drip irrigation systems at the cultivation areas. Drip lines will be sized to irrigate the cultivation areas at a slow rate to maximize absorption and prevent runoff. Drip irrigation systems, when implemented properly, conserve water compared to other irrigation techniques.

PROJECT WATER DEMAND

The CalCannabis Environmental Impact Report (CDFA, 2017) uses 6.0 gallons per day per plant as an estimated water demand for cannabis cultivation. This is 1.0 gallon (gpd) per plant more than reported by Bauer et. al. (2015), who reported up to 5.0 (gpd) per plant (18.9 Liters/day/plant). Using the more conservative estimate of 6.0 gpd (CDFA, 2017), the demand is 3,000 gpd (2.1 gallons per minute [gpm]) per acre of canopy. The estimate of 6.0 gpd is a largely conservative estimate for a large outdoor plant, measured in the driest period of the season. Another estimate that is used for outdoor cultivation 1.2 to 14.7 gallons per canopy square foot per year (Ascent, 2017) which equates to 290-3,560 gpd per acre of canopy over a 180-day cultivation season. Annual demand is estimated here using the most conservative estimate of 3,560 gpd per acre of canopy.

This is an average daily demand over the cultivation period which is lower during seedling/vegetative states and higher during the flowering period. Assuming 65% of the time the cultivation is in the vegetative state and 35% it is in the flowering state and the water use during the flowering period is about 1.7 times the water used during the vegetative state, the total estimated irrigation water demand, for 5.69 acres of cannabis canopy is as follows:

- Average Daily – 20,280 gpd
- Maximum Daily (Flowering Period) – 27,850 gpd
- Yearly (assuming up to 180-day outdoor season):
    - 11.2 acre-feet per year (AFY) or 3,650,000 gallons per year

Table 1. Estimated projected monthly water use based on vegetative (65% or 117 days) and flowering (35% or 117 days) periods.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Irrigation (1,000 gal)	0	0	0	243	502	486	502	747	835	334	0	0	3,650

The estimated irrigation water demand reported above is an average daily rate over the course of the growing season; however, seasonal water demand likely varies in response to temporal and environmental variables (e.g., temperature, relative humidity, wind, plant age and size, etc.).

GROUNDWATER BASIN INFORMATION AND HYDROGEOLOGY

The well is located on a ridge in an undefined groundwater basin within the Franciscan Formation. The ridge is located above the High Valley Groundwater Basin (Basin #5-16) located approximately 0.5-miles to the southeast and the Long Valley Groundwater Basin (Basin #5-31) located approximately 2-miles to the northeast (Figure 1). The project well is located on a ridge within an area that drains towards both basins, but is much closer to the High Valley Groundwater Basin.

The High Valley Groundwater Basin is within the Schindler Creek Watershed and includes High Valley, a small valley about 3-miles long and 1-mile wide. The contact between the Jurassic-Cretaceous Franciscan Formation bounding the valley alluvium generally defines the basin boundary to the north, west, and south. Quaternary Holocene volcanics border the basin to the east. The valley is drained by Schindler Creek, flowing east and south, and eventually into Clearlake. There are two water bearing formations in the High Valley Basin, an unconfined aquifer within the Quaternary Alluvium, approximately 100-feet deep, and a confined aquifer within the Holocene Volcanics, below the alluvium. According to the Lake County Groundwater Management Plan, the average-year agricultural groundwater demand in the High Valley basin is approximately 36 AF per year. However, a recent report presented to the Lake County Planning Commission (Kimley-Horn, 2021) estimated the demand to be about ten times this amount. Wells in the valley range in depth between 25-feet and 650-feet. Surface topography in the valley ranges between 1,920-feet and 1,720-feet. (CDM 2006 and California DWR 2003, 2021)

The High Valley Groundwater Basin has not been identified by the California Department of Water Resources (DWR) as critically overdrafted basin. Critically overdrafted is defined by DWR as, “A basin subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." In addition, as part of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, DWR created the CASGEM Groundwater Basin Prioritization statewide ranking system to prioritize California groundwater basins in order to help identify, evaluate, and determine the need for additional groundwater level monitoring. California’s groundwater basins were classified into one of four categories high-, medium-, low-, or very low-priority. The High Valley Groundwater Basin is ranked as a very low-priority basin by the CASGEM ranking system. (DWR, 2021)

The geologic log from the project’s WCR reported varying layers of sandstone and shale from 20 ft bgs to 400 ft bgs. Per the Geologic Map of California, the area is mapped within the Jurassic-Cretaceous Franciscan Formation (Figure 2), consistent with the description of sandstone described in the WCR.

The project site is in a sparsely populated area. According to the California Department of Water Resources (DWR) Well Completion Reports (WCR) Map Application, the project’s well is located at the boundary between Public Land System Survey (PLSS) Sections M14N08W14 and M14N08W15 in the northern portion the sections. There are a total of six (6) wells listed by the WCR Map within these two PLSS Sections, however, they are all mapped incorrectly and not actually located in these Sections. See summary provided below.

- Section M14N08W15
    - There is one well logged by the WCR Map Application in this section (WCR1961-001319), a domestic well, that is incorrectly logged and mapped as the log says it is located 6 miles north of Clearlake Oaks.
- Section M14N08W14 – There are five wells logged by the WCR Map Application, however, they are mapped in correctly and not actually located in this section.
    - WCR 1979-004378: Domestic well that is incorrectly mapped, it is not located in this section.
    - WCR's 2006-008044 through 008047: Monitoring wells that are incorrectly mapped, it is not located in this section.

There is another well (Attachment 2) that is not logged on the WCR Map Application located on APN 006-004-19 and associated with UP 20-21, approximately 1,500 feet northeast of the project parcel. This well is drilled to a depth of 320 ft bgs into shale and sandstone with a recorded yield of over 100 gpm. The well geologic log is similar to the project's well log.

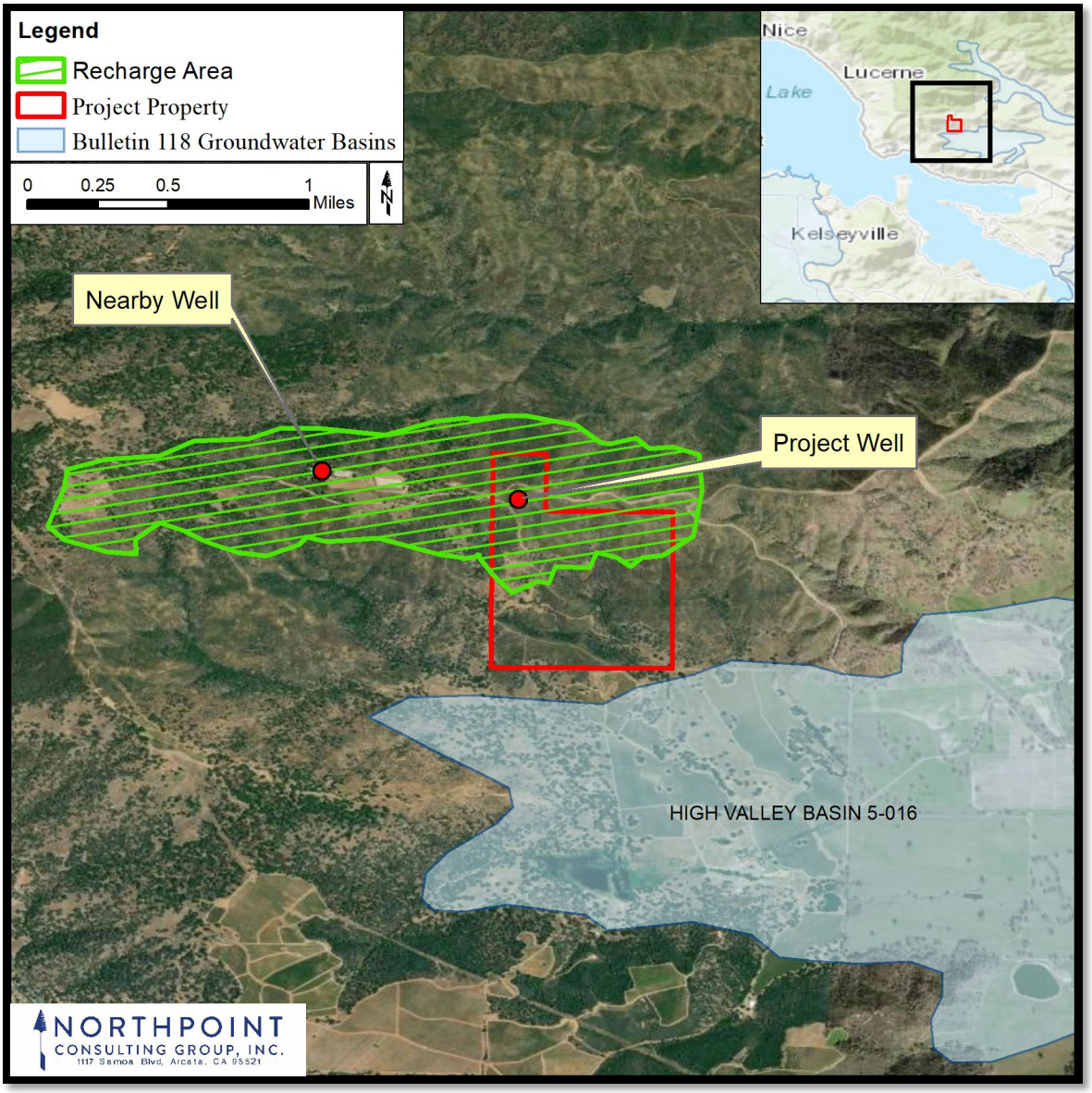

Figure 1: Project Parcel and nearby California Bulletin 118 mapped groundwater basins, stream hydrography, project well location, and recharge area. The inset map shows the project location in relation to Clearlake and Lower Lake. The extent of the larger map is depicted by the black box in the inset map.

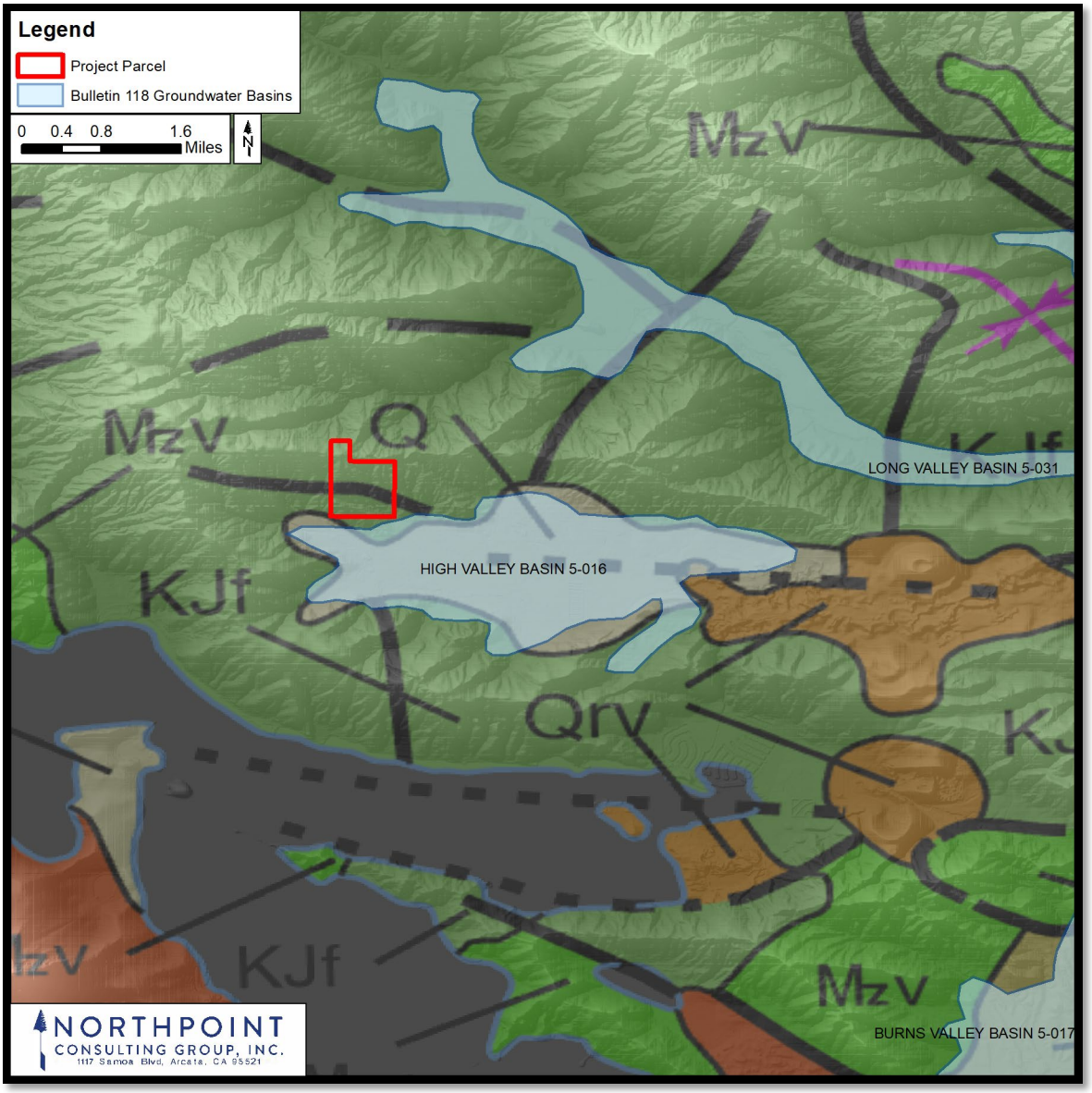

Figure 2: Geologic Map of California with the project parcel outlined in red. 'KJf' = Upper Cretaceous shale, sandstone, and conglomerate, consistent with the geologic log of the well completion report.

GROUNDWATER SOURCE RECHARGE RATE

Annual groundwater recharge can be estimated using a water balance equation, where recharge is equal to precipitation (P) less runoff (Q) and abstractions that do not contribute to infiltration (e.g., evapotranspiration). A simple tool that can be used to estimate runoff and abstractions, that uses readily available data, is the Natural Resources Conservation Service (NRCS) Curve Number (CN) Method (NRCS, 1986). The CN is an empirical parameter used to predict runoff or infiltration from excess rainfall. Determination of the CN depends on the watershed's soil and cover conditions, cover type, treatment, and hydrologic condition. The CN Method runoff equation is

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

Where,

Q = runoff (inches)
P = rainfall (inches)
S = potential maximum retention after runoff begins (inches) and
I_a = initial abstraction (inches)

The initial abstraction (I_a) represents all losses before runoff begins, including initial infiltration, surface depression storage, evapotranspiration, and other factors. The initial abstraction is estimated as $I_a = 0.2S$. S is related to soil and cover conditions of the watershed through the CN, determined as $S = 1000/CN - 10$. Using these relations, the runoff equation becomes:

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

The CN is estimated based on hydrologic soil group (HSG), cover type, condition, and land use over the area of recharge, which is estimated as the recharge area contributing to the well. The depth of the completed well is 400 ft bgs and is at an elevation of approximately 2,260 ft MSL. The approximate recharge area is estimated as the area delineated using the bottom elevation of the well, or 462 acres (Figure 1).

Soils are classified into four HSGs (A, B, C, and D) according to the soils ability to infiltrate water; where HSG A has the highest infiltration potential and HSG D has the lowest infiltration potential. HSGs are based on soil type and are determined from the NRCS Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm).

The recharge area is comprised of two HSGs: HSG C (227-acres or 49%), and HSG D (235-acres or 51%) (Attachment 3). The cover type is mainly shrubland/brush in fair condition. The CNs and areas are summarized in Table 2.

Table 2. Land Use and Curve Numbers.

Land Use Type	HSG	Condition	CN	Area (acres)	Weighted CN
Brush	C	Fair	70	227	73.5
Brush	D		77	235	

The PRISM Climate Group gathers climate observations from a wide range of monitoring networks and provides time series values of precipitation for individual locations from 1895 to 2020 (https://prism.oregonstate.edu/explorer/), however, to represent the more recent time period, the annual precipitation from 2000 to 2022, as predicted by PRISM, was used. The annual average precipitation over this period is 33.0 inches and the minimum precipitation over this period (and the entire period of record) is 8.1 inches (Attachment 4).

Using the above information, and assuming that 100% of the initial abstraction is evapotranspiration, the estimated annual recharge over the recharge area of 462 acres is summarized in (Table 3). Also included in Table 3 is the amount of recharge contributed by the project parcel.

Table 3. Estimated annual recharge over the recharge area of the project's well.

Recharge Area (acres)	P (inches)	CN	S (inches)	I_a (inches)	Q (inches)	Recharge = $P - Q - *I_a$ (inches)	Recharge (AF)
462	8.1	73.5	3.601	0.72	5.0	2.8	107
462	33.0	73.5	3.601	0.72	29.0	3.6	139
196.7	8.1	73.5	3.601	0.72	5.0	2.8	46
196.7	33.0	73.5	3.601	0.72	3.6	3.6	59

CUMULATIVE IMPACT TO SURROUNDING AREAS

The maximum annual water demand of the proposed cannabis project is estimated to be approximately 11.2 AFY. The recharge area, approximately 462 acres, was estimated using the bottom elevation of the well in which water is drawn. The estimated recharge over the 462-acre recharge area is 107 AFY and 139 AFY during a dry and average year, respectively. If only the parcel area is used to estimate the project parcel's contribution to recharge, the parcel's contribution to recharge is approximately 46 AFY and 59 AFY during a dry and average year, respectively.

Although determined for humid basins in the east, the USGS (USGS Fact Sheet 2007-3007) estimated long-term average recharge to be between 10 and 66 percent of precipitation. Over the 462-acre recharge area this would equate to 31.3 – 206.3 AFY during a dry year and 127 – 838 AFY during an average year. The recharge estimates in Table 3 fall within these ranges for a dry year and on the lower end for an average year. The estimated long-term average associated with the project parcel's contribution to recharge would equate to 13.3 – 87.9 AFY during a dry year and 54.1 – 256.8 AFY during an average year. To be conservative, using a recharge value of 13.3 AFY to represent a drought year and 54.1 AFY to represent an average year, over the 196.7-acre parcel area, there is sufficient recharge to meet the project's irrigation demand, even during drought years.

There is an existing outdoor cannabis cultivation project, UP 20-21, on APN 006-004-19, located on the same ridge, approximately 1,500 feet to the northwest. The irrigation source for this project is a groundwater well within the same recharge area as the project's well. UP 20-21 is permitted to cultivate up to 4 acres of outdoor cannabis canopy. Annual demand, using 3,000 gpd/acre, is approximately 12,000 gpd or 6.6 AFY over a 180-day cultivation season. The neighboring operator was also interviewed about their onsite well used for irrigation. According to the operator, the well has been able to supply their irrigation needs without any problems.

The cumulative water demand in the recharge area is 16 AFY. The lowest estimate of recharge over the recharge area during a drought year is 31.3 AFY. Therefore, there is sufficient recharge to meet both project's demands, even during drought years.

The project proposes 79,000-gallons of water storage, representing approximately 3 to 4 days of water storage for the cannabis operation. Assuming daily irrigation for outdoor cultivation is conducted in up to 4 hours, the project's well would have 20 hours to recover and/or fill the water storage tanks during the 20-hours when irrigation is not occurring. At a rate of 20 gpm, the tanks would recover approximately 24,000 gallons in 20-hours, which is sufficient to meet the average daily and maximum daily demand. The existing 5 Horsepower, solar well pump has the capacity to pump 20 gpm.

Even though it appears there is sufficient groundwater recharge and supply to meet the project's demand,

since the project's water source is in a water-bearing formation with little background information and the recharge rate is an estimate determined using an approximation of the recharge area and the *in-situ* characteristics of the water source; it is recommended that the project applicant monitor water levels in the wells. The purpose of the monitoring is to evaluate the functionality of the well to meet the long-term water demand of the proposed project and validate the annual recharge of the water-bearing formation. Water level monitoring is required by the Lake County Zoning Ordinance. Ordinance Article 27 Section 27.11(at) 3.v.e. requires the well to have a water level monitor. Recommendations for well water level monitoring are provided below.

OPERATIONAL WATER MONITORING, CONSERVATION MEASURES, DROUGHT MANAGEMENT

Standard Operational Measures

Standard operational procedures are recommended, regardless of whether the project is in an area experiencing drought conditions, including ongoing water monitoring and conservation measures that would reduce the overall use of water. These measures should be incorporated into the Water Use section (Section 9) of the project's Property Management Plan. Water Use includes information on water sources and metering, estimated water use, water conservation, and the irrigation system. Recommended on-going water conservation measures include, but may not be limited to, the following:

- No surface water diversion;
- Selection of plant varieties that are suitable for the climate of the region;
- The use of drip irrigation (instead of spray irrigation);
- Cover drip lines with straw mulch or similar to reduce evaporation;
- Water application rates modified from data from soil moisture meters and weather monitoring;
- Shutoff valves on hoses and water pipes;
- Daily visual inspections of irrigation systems;
- Immediate repair of leaking or malfunctioning equipment; and
- Water use metering and budgeting – a water budget will be created every year and water use efficiency from the previous year will be analyzed.

In addition to water use metering, water level monitoring is also required by the Lake County Zoning Ordinance. Ordinance Article 27 Section 27.11(at) 3.v.e. requires the wells to have a meter to measure the amount of water pumped as well as a water level monitor. In addition to the above measures, well water level monitoring and reporting shall be performed as follows:

Seasonal Static Water Level Monitoring: The purpose of seasonal monitoring of the water level in the wells is to provide information regarding long-term groundwater elevation trends. It is recommended that the water level in the wells be measured and recorded once in the Spring (March/April), before cultivation activities begin, and once in the fall (October) after cultivation is complete. (note: The California Statewide Groundwater Monitoring Program (CASGEM) monitors semi-annually around April 15 and October 15). Records shall be kept, and elevations reported to the County as part of the project's annual reporting requirements. Reporting shall include a hydrograph plot of all seasonal water level measurements to-date, beginning with the initial measurement. Seasonal water level trends will aid in the evaluation of the recharge rate of the well. For example, if the water level measured during the Spring remains relatively constant from year to year, then the water source is recharging each year.

Water Level Monitoring During Extraction: The purpose of monitoring the water level in the Project Well during extraction is to evaluate the performance of the wells to determine the effect of the pumping rate on the water source during each cultivation season. This information shall be used to determine the capacity and yield of the well to aid the cultivators in determining pump rates and the need for water storage. The frequency of water level monitoring will depend on the source, the source's capacity, and the pumping rate. It is recommended that initially the water level be monitored twice per week or more, and that the frequency be adjusted as needed depending on the impact the pumping rate has on well water levels. Records shall be kept, and elevations reported to the County as part of the project's annual reporting requirements. Reporting shall include a hydrograph plot of the water level measurements during the cultivation season and compared to prior seasons.

Measuring a water level in a well can be difficult and the level of difficulty will depend on site-specific conditions. As part of the well monitoring program, the well owner/operator shall work with a well expert to determine the appropriate methodology and equipment to measure the water level in their well(s) as well as who will conduct the monitoring and recording of the well level data. The methodology of the well monitoring program shall be described and provided in the project's annual report to the County.

The groundwater level monitoring protocol is recommended to provide a framework for the early detection and response if there is groundwater depletion or inadequate recharge. Thus, in addition to monitoring and reporting, an analysis of the water level monitoring data shall be provided and included in the project's annual report, demonstrating whether use of the well is causing significant drawdown and/or impacts to the surrounding area and what measures were taken to reduce impacts. If there are impacts, a revised Water Management Plan, including a revised water budget, shall be prepared and submitted to the County, for review and approval, demonstrating how the project will operate and mitigate the impacts in the future, including changes in operation, if necessary.

Drought Management Plan / Drought Emergency Water Conservation Measures

Drought can reduce both water availability and water quality necessary for productive farming, ranches, and grazing lands, resulting in significant negative direct and indirect economic impacts to the farm. As discussed above, recommended project monitoring will help detect if seasonal groundwater depletion is occurring, which is especially important during periods of drought. In addition, project reporting requires a revised Water Management Plan that demonstrates how the project will operate to address groundwater depletion.

To plan and prepare for drought conditions, the project will follow recommendations for monitoring, planning, and preparedness provided by the National Integrated Drought Information System - https://www.drought.gov/sectors/agriculture.

In addition to the above ongoing conservation measures, water metering, and reporting, during times of drought emergencies or water scarcity, the project will implement the following additional measures, as needed or appropriate to the site, to reduce water use and ensure both success and decreased impacts to surrounding areas:

- Install additional water storage and/or implement a rainwater catchment system;
- Install moisture meters to monitor how much water is in the soil at the root level and reduce watering to only what is needed to avoid excess;
- Cover the soil and drip-lines with removable plastic covers or similar to reduce evaporation;

- Irrigate only in the early morning hours or before sunset;
- Cover plants with shaded meshes during peak summer heat to reduce plant water needs; and/or
- Use a growing medium that retains water in a way to conserve water and aid plant growth. Organic soil ingredients like peat moss, coco coir, compost and other substances like perlite and vermiculite retain water and provide a good environment for cannabis to grow.

In the event the well cannot supply the water needed for the project, the following measures may be taken:

- Reduce the amount of cultivation and/or length of cultivation season;
    - The amount of cultivation would be determined based on available water
    - Early crop harvest, if water becomes limited
- Install additional storage and/or implement a rainwater catchment system, installation of a rainwater catchment pond could provide additional storage and catchment area if the existing groundwater source becomes depleted; and/or
- If possible, develop an alternative, legal, water source that meets the requirements of Lake County Codes and Ordinances.

CONCLUSION

Since there is sufficient groundwater supply and annual recharge to meet the project's demand during average and dry years, the project is situated in an area of extremely low population and well densities, there is little impact to surrounding wells – with the implementation of water monitoring, reporting, conservation measures, and drought management practices, the proposed project water use would not have a cumulative impact on the surrounding area.

QUALIFICATIONS OF AUTHOR

Dr. Dodd has a PhD in Water Resources Engineering. In addition, Dr. Dodd is a registered Professional Engineer with the State of California with 30-years of experience practicing and teaching Water Resources Engineering, including over 15 years of teaching, practicing, and modeling surface and groundwater hydrology.

LIMITATIONS

The study of groundwater hydrology is very complex and often relies on limited data, especially in rural areas. Recommendations and conclusions provided herein are based on professional judgment made using information of the groundwater systems and geology in Lake County, which is limited and allows only for a general assessment of groundwater aquifer conditions and recharge. NorthPoint Consulting Group, Inc. is making analyses, recommendations, and conclusions based on readily available data, including studies and reports conducted by other professionals, Lake County, the State of California, and other consultants hired by the project proponent to prepare technical studies for the proposed project. If additional information or data becomes available for the project area, the recommendations and conclusions presented herein may be subject to change. 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.

ATTACHMENTS:

1. Site Map
2. Well Completion Reports
3. NRCS Soil Survey Results
4. PRISM Climate Precipitation 2000 to 2020

REFERENCES

Ascent. 2017. Draft Environmental Impact Report for the Amendments to Humboldt County Code Regulating Commercial Cannabis Activities. SCH# 2017042022 Commercial-Cannabis-Draft-EIR-20mb-PDF (humboldtgov.org)

Bauer S, Olson J, Cockrill A, van Hattem M, Miller L, Tauzer M, et al. (2015). Impacts of Surface Water Diversions for Marijuana Cultivation on Aquatic Habitat in Four Northwestern California Watersheds. PLoS ONE 10(9): e0137935. https://doi.org/10.1371/journal.pone.0137935

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Attachment 1:
Site Map

POVERTY FLATS RANCH

MAJOR USE PERMIT

APN: 006-004-22

VICINITY MAP
NOT TO SCALE

DIRECTIONS TO SITE:

FROM CLEARLAKE OAKS, CA

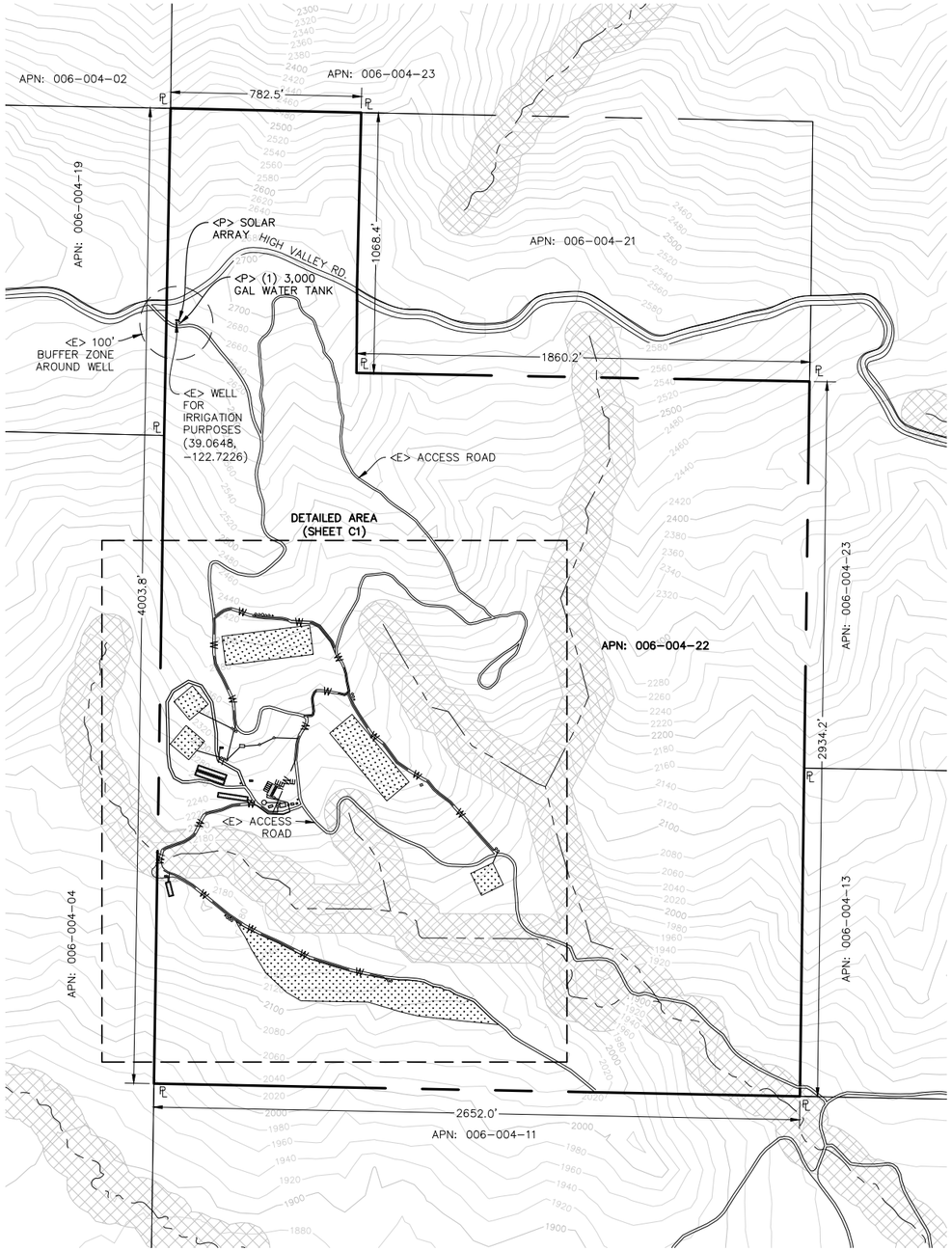
-NORTHEAST ON SR-20E (0.3 MILES) TOWARDS LAKE STREET/LAKELAND STREET
-TURN LEFT AND TAKE HIGH VALLEY ROAD (5.4 MILES)
-THE PRIVATE DRIVEWAY FOR 10535 HIGH VALLEY ROAD WILL BE ON THE LEFT

PROJECT DESCRIPTION:

POVERTY FLATS RANCH IS PROPOSING TO PERMIT COMMERCIAL CANNABIS IN ACCORDANCE WITH THE LAKE COUNTY USE ORDINANCE (ARTICLE 27). THE PROPOSAL IS FOR FIVE (5) A-TYPE 3 OUTDOOR LICENSES, THREE (3) A-TYPE 2 OUTDOOR LICENSES, FOR A TOTAL OF 247,800 SQ. FT. (5.68 ACRES) OF OUTDOOR CANOPY AREA, AND A TYPE 13 SELF-DISTRIBUTION LICENSE. THE PROPOSAL ALSO INCLUDES THE DEVELOPMENT OF FACILITIES APPURTENANT TO CULTIVATION, INCLUDING HOOP HOUSES, FACILITIES FOR DRYING AND CURING OF HARVESTED CANNABIS, STORAGE SHEDS AND IRRIGATION INFRASTRUCTURE.

GENERAL NOTES:

1. DRAWING SCALE AS NOTED. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
2. THIS IS NOT A BOUNDARY SURVEY. BOUNDARY INFORMATION DEPICTED HAS BEEN OBTAINED FROM LAKE COUNTY 2015 GIS DATA. NORTHPOINT CONSULTING GROUP, INC. HAS NOT VERIFIED THIS PROPERTY BOUNDARY.
3. THERE ARE NO NEARBY SCHOOLS, SCHOOL BUS STOPS, PLACES OF WORSHIP, PUBLIC PARKS OR TRIBAL RESOURCES WITHIN 1,000 FEET OF THE PROPOSED CULTIVATION AREA.
4. THERE ARE NO RESIDENCES ON ADJOINING PARCELS WITHIN 200 FEET OF THE PROPOSED CULTIVATION AREAS.
5. ANY EXISTING DEVELOPMENT CONSTRUCTED WITHOUT THE BENEFIT OF COUNTY REVIEW WILL BE SUBJECT TO THE LAKE COUNTY BUILDING DEPARTMENT UPON APPROVAL OF THE USE PERMIT.



PLOT PLAN

22x34 SHEET: 1"=300'
11x17 SHEET: 1"=600'
0 150 300 600

PROJECT INFORMATION:

APPLICANT:
KURT "RUSTY" BARTHEL
24760 E BRIGHT AVE.
WELCHES, OR 97067

PROPERTY OWNER:
KURT R BARTHEL AND TRUSTEES
24760 E BRIGHT AVE.
WELCHES, OR 97067

APPLICANTS AGENT:
NORTHPOINT CONSULTING GROUP, INC
1117 SAMOA BLVD.
ARCATA, CA 95521
(707) 798-6438

SITE ADDRESS:
APN: 006-004-22
10535 HIGH VALLEY RD
CLEARLAKE OAKS, CA 95423

ZONING = RL

OUTDOOR CANOPY AREA = 247,800 SF

WATER	= PRIVATE
SEWER	= PRIVATE
PROPERTY SIZE	
APN: 006-004-22	= ±196.70 ACRES
GRADING	= REFER TO PRELIMINARY GRADING PLAN

SHEET INDEX:

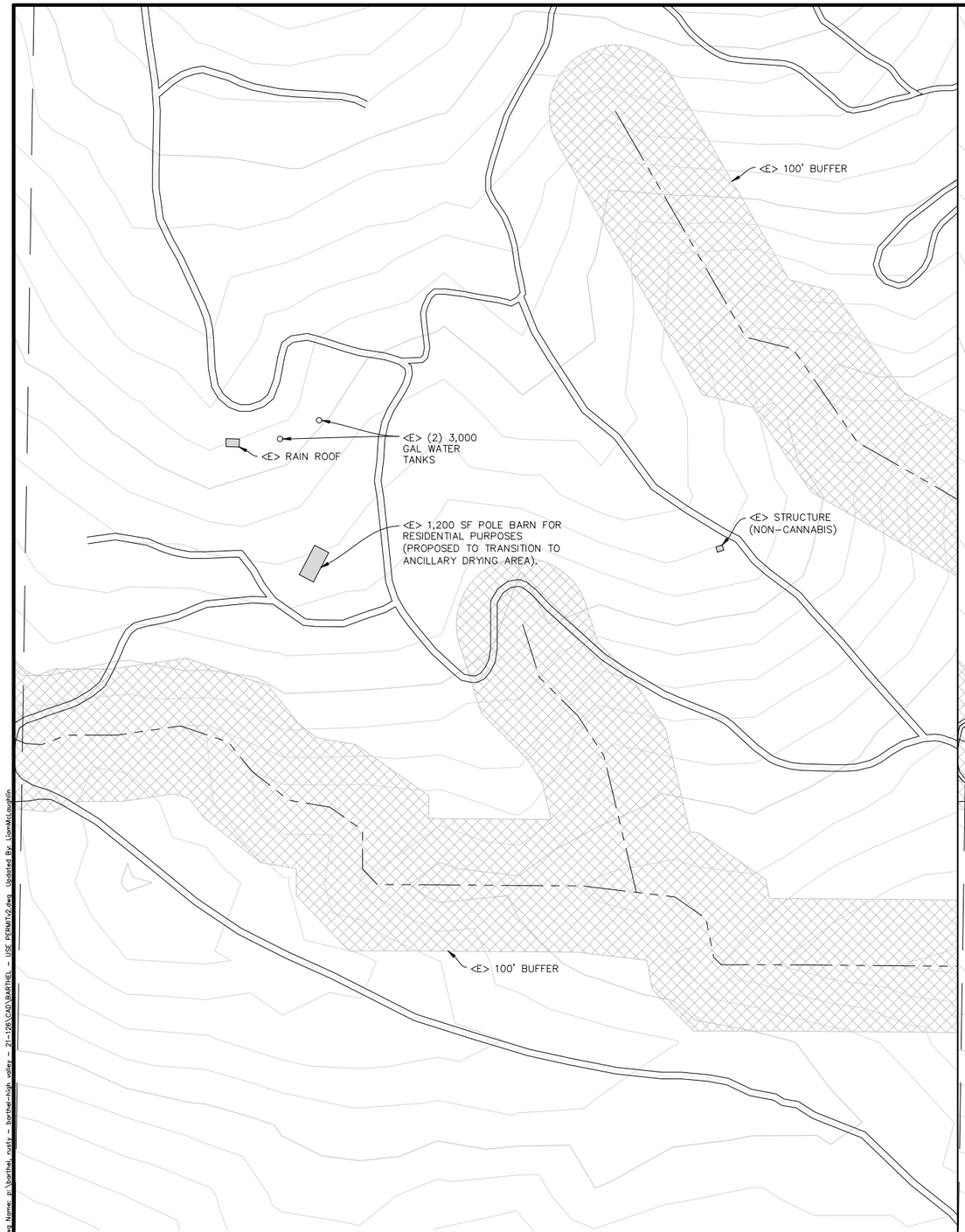
DRAWN BY | REVISIONS | DATE

NORTHPOINT CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

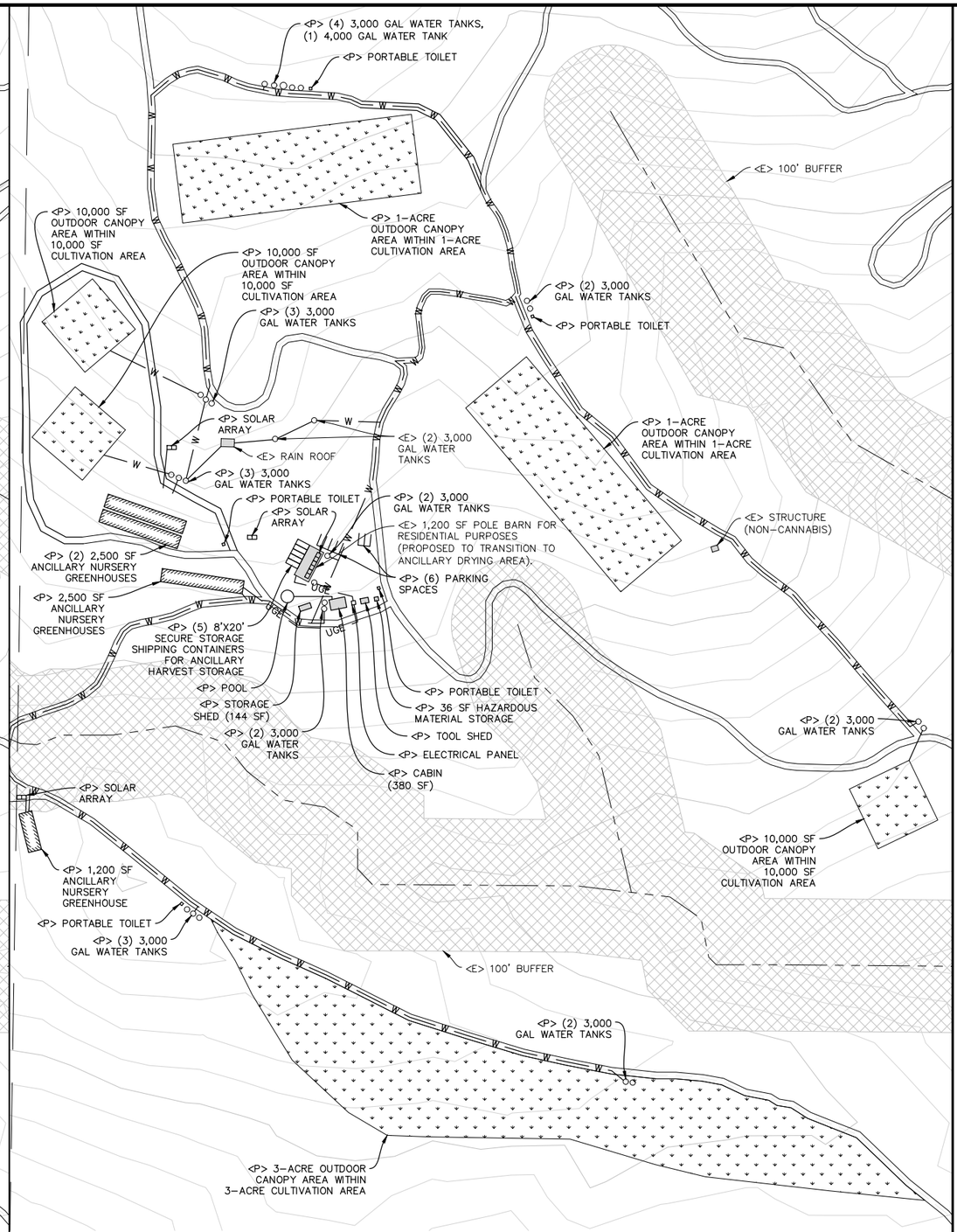
POVERTY FLATS RANCH - MAJOR USE PERMIT
10535 HIGH BALLEY RD. CLEARLAKE OAKS, CA 95423
PLOT PLAN, VICINITY MAP, & PROJECT NOTES

PROJ. MGR.: AD
DRAWN BY: CJG
DATE: 10/24/23
SCALE: AS SHOWN

SHEET
C0
21-126



EXISTING SITE PLAN



PROPOSED SITE PLAN

22x34 SHEET: 1"=100'
11x17 SHEET: 1"=200'

0 75 150 200

N

LEGEND:

W – WATER LINE

UGE – UNDERGROUND ELECTRICAL LINE

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NORTHPOINT
CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

POVERTY FLATS RANCH - MAJOR USE PERMIT

10535 HIGH BALLEY RD. CLEARLAKE OAKS, CA 95423

EXISTING AND PROPOSED SITE PLAN

PROJ. MGR.:	AD
DRAWN BY:	CJG
DATE:	10/24/23
SCALE:	AS SHOWN

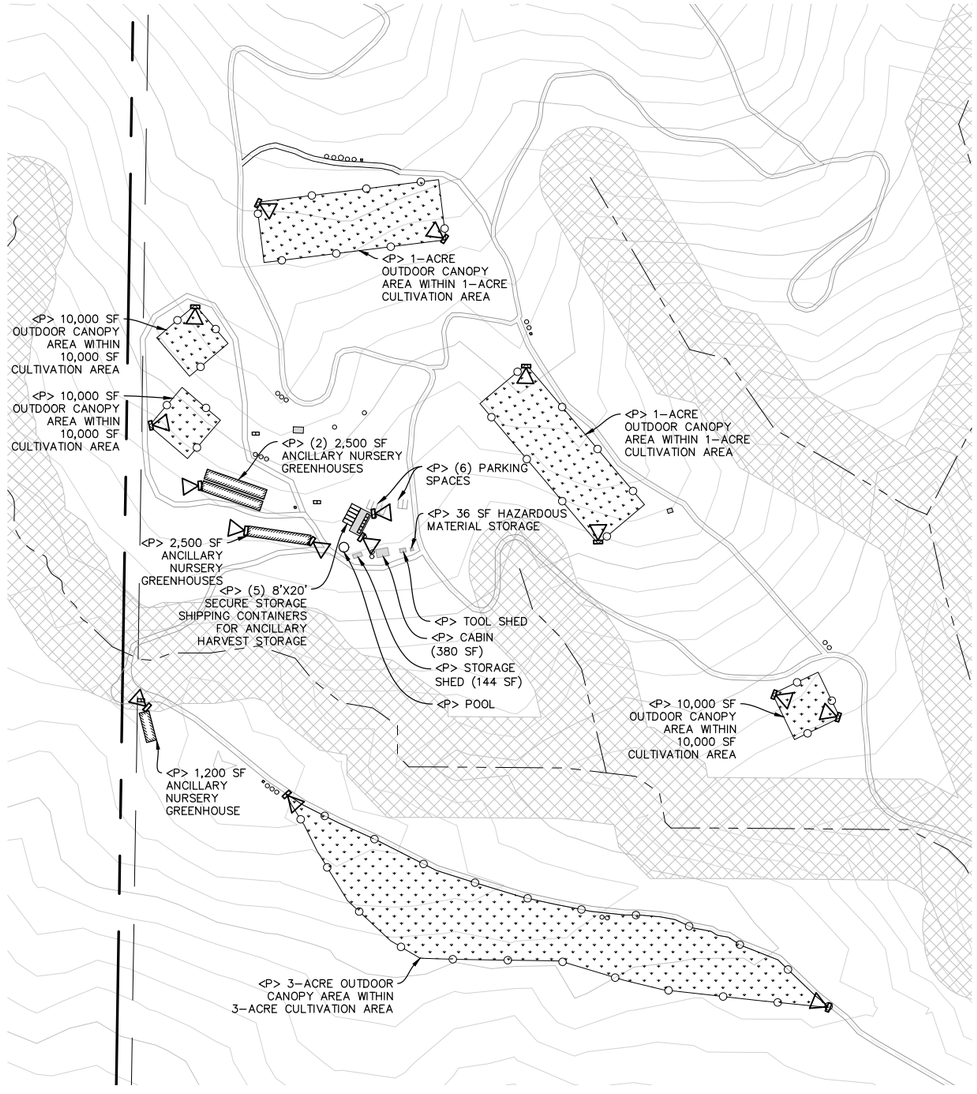
SHEET
C1
21-126

October 24, 2023 - 14:11 Dwg Name: p:\bartlet-rusty - bartlet-high valley - 21-126\CAD\BARTHEL - USE PERMIT v2.dwg Updated By: LianaMcLaughlin

POVERTY FLATS RANCH

MAJOR USE PERMIT

APN: 006-004-22



SECURITY LEGEND:

– MOTION SENSOR, LIGHTING AND SECURITY CAMERA

—o— – FENCE

PROPOSED SECURITY PLAN

22x34 SHEET: 1"=150'
11x17 SHEET: 1"=300'

0 75 150 300

N

DRAWN BY | REVISIONS | DATE

NORTHPOINT CONSULTING GROUP, INC.
1117 Samoa Blvd., Arcata, CA 95521

POVERTY FLATS RANCH - MAJOR USE PERMIT
10535 HIGH BALLEY RD. CLEARLAKE OAKS, CA 95423
PROPOSED SECURITY PLAN

PROJ. MGR.: AD
DRAWN BY: CJG
DATE: 10/24/23
SCALE: AS SHOWN

SHEET
C2
21-126

Attachment 2:
Well Completion Reports

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

Project Well Report

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. xxxxxx

Page 1 of 1

Owner's Well Number 1

Date Work Began 8/8/22 Date Work Ended 8/12/22

Local Permit Agency Lake County Environmental Health

Permit Number WC-5814-99 Permit Date 5/22/22

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Air Rotary Drilling Fluid

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	20	Brown Shale & Brown clay
20	200	Black Shale
200	240	Sand Stone & Black Shale
240	260	Sand Stone & Green Stone
260	400	Sand Stone

Total Depth of Boring 400 Feet

Total Depth of Completed Well 395 Feet

Well Owner

Name Robert Barthel

Mailing Address 24760 E. Bright Ave

City Welches State OR Zip 97067

Well Location

Address 10535 Highvalley Rd

City Clearlake Oaks County Lake

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

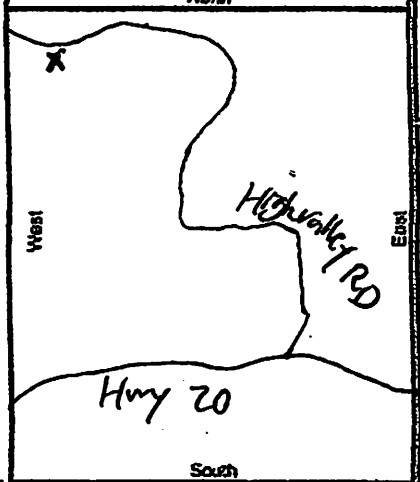
Datum Dec. Lat. Dec. Long.

APN Book 006 Page 004 Parcel 720

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

● New Well
○ Modification/Repair
○ Deepen
○ Other
○ Destroy
Describe procedures and materials under "CONSTRUCTION"

Planned Uses

● Water Supply
Domestic ☐ Public
■ Irrigation ☐ Industrial
○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water 200 (Feet below surface)

Depth to Static Water Level (Feet) Date Measured 8/12/22

Estimated Yield* 40 (GPM) Test Type Air Lift

Test Length 2hrs (Hours) Total Drawdown (Feet)

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

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size If Any (Inches)
0	200	9.0	FH80	PVC	1/4	4.5	Blank	
200	280	9.0	FH80	PVC	1/4	4.5	Perf	.032
200	300	9.0	FH80	PVC	1/4	4.5	Blank	
300	400	9.0	FH80	PVC	1/4	4.5	Perf	.032

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	1	Seal	Concrete
1	21	Seal	Bentonite
21	400	Filter	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 Willpeterson Well Drilling

P.O. Box 695 Icelesville CA 95451

Signed [signature] 8-11-22

C-57 Licensed Water Well Contractor Date Signed C-57 License Number 1009053

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

Neighbor Well Report

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. XXXXXXX

Page 1 of 1

Owner's Well Number 2

Date Work Began 3-9-20 Date Work Ended 3-13-20

Local Permit Agency Lake County Environmental Health

Permit Number WE 5285 Permit Date 1-21-20

DWR Use Only – Do Not Fill In

State Well Number/Site Number

Latitude N Longitude W

APN/TRS/Other

Geologic Log

Orientation ● Vertical ○ Horizontal ○ Angle Specify

Drilling Method Air Rotary/Mud Rotary Drilling Fluid Bentonite

Depth from Surface Feet	to Feet	Description Describe material, grain size, color, etc
0	20	Brown Clay
20	50	Brown Clay with sandstone
50	60	Brown Shale
60	120	Black Shale
120	320	Black Shale/sandstone/ Calsite

Total Depth of Boring 325 Feet

Total Depth of Completed Well 320 Feet

Well Owner

Name Tim Wrinkler

Mailing Address 245 Paula Ln

City Petaluma State CA Zip 94952

Well Location

Address 9850 High Valley Rd.

City Clearlake Oaks County LAKE

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

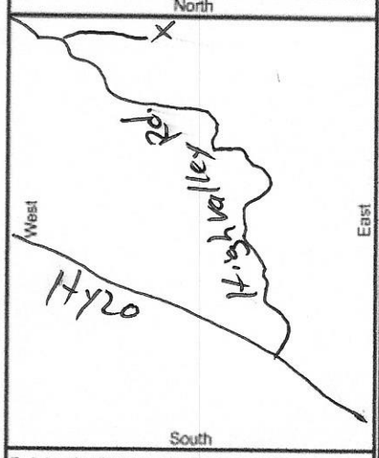
Datum Dec. Lat. Dec. Long.

APN Book 006 Page 004 Parcel 19

Township Range Section

Location Sketch

(Sketch must be drawn by hand after form is printed.)



Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

Activity

● New Well

○ Modification/Repair
- ○ Deepen
- ○ Other

○ Destroy

Describe procedures and materials under "GEOLOGIC LOG"

Planned Uses

● Water Supply
- ■ Domestic ☐ Public
- ■ Irrigation ☐ Industrial

○ Cathodic Protection
○ Dewatering
○ Heat Exchange
○ Injection
○ Monitoring
○ Remediation
○ Sparging
○ Test Well
○ Vapor Extraction
○ Other

Water Level and Yield of Completed Well

Depth to first water 120' (Feet below surface)

Depth to Static Water Level 120' (Feet) Date Measured 3-12-20

Estimated Yield * 100+ (GPM) Test Type Air lift

Test Length 2 HRS (Hours) Total Drawdown (Feet)

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

Casings

Depth from Surface Feet	to Feet	Borehole Diameter (Inches)	Type	Material	Wall Thickness (Inches)	Outside Diameter (Inches)	Screen Type	Slot Size if Any (Inches)
0	260	9"	F480	PVC	1/4"	5"	Blank	—
260	320	9"	F480	PVC	1/4"	5"	Perfs	.035

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	1	Concrete	SEAL
1	24	Bentonite	
24	320	#16 Pea	Gravel Pack

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 Will Peterson Well Drilling (Person, Firm or Corporation)

P.O. Box 695 (Address) Kelseyville (City) CA (State) 95451 (Zip)

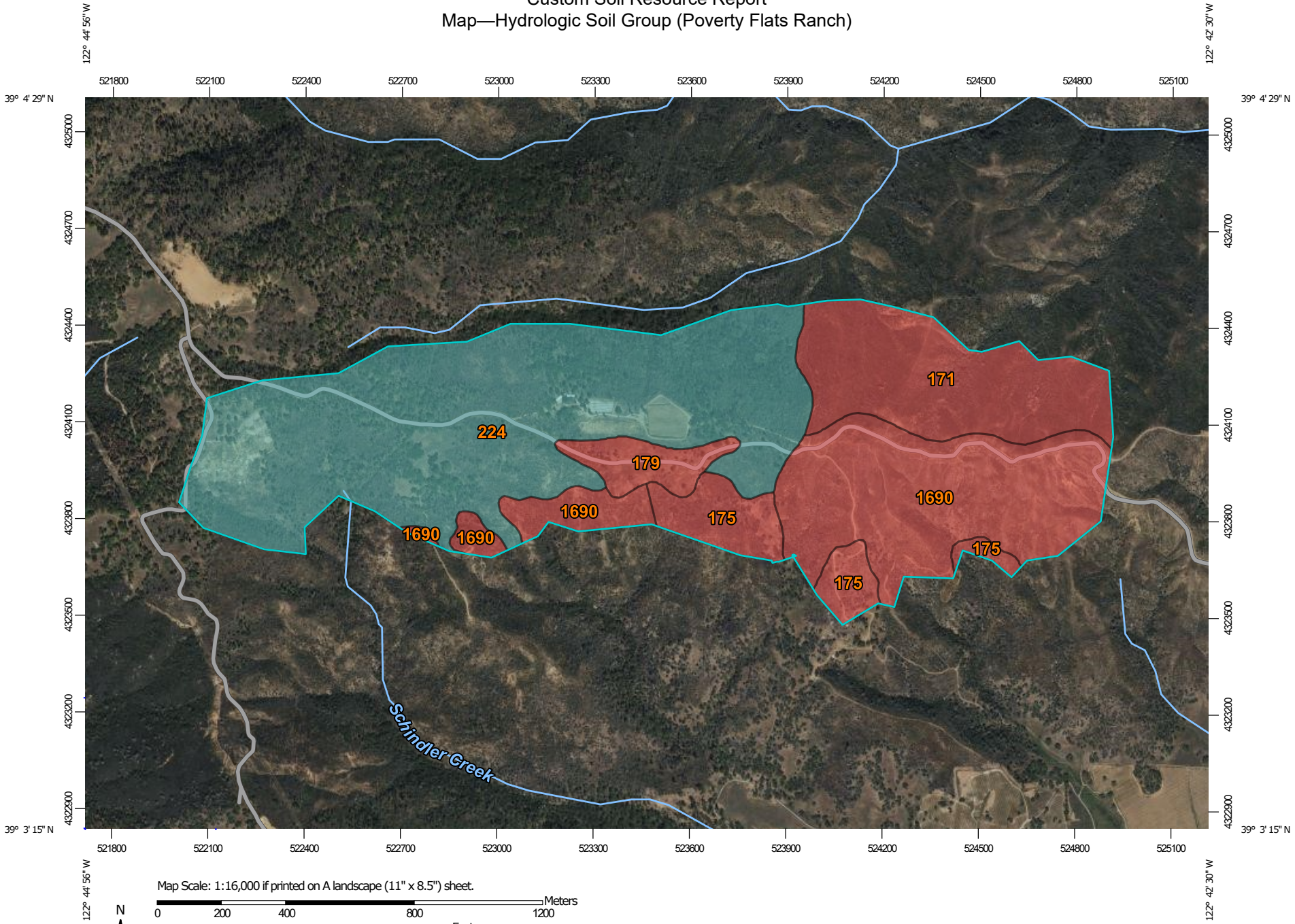
Signed (C-57 Licensed Water Well Contractor) 3-16-20 (Date Signed) 1009053 (C-57 License Number)

DWR 188 REV. 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Attachment 3:
NRCS Soil Survey Results

Custom Soil Resource Report
Map—Hydrologic Soil Group (Poverty Flats Ranch)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lake County, California
Survey Area Data: Version 20, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 7, 2022—May 31, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (Poverty Flats Ranch)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
171	Maymen-Hopland-Etsel association, 15 to 50 percent slopes	D	74.2	16.1%
175	Maymen-Millsholm-Bressa complex, 30 to 50 percent slopes	D	29.2	6.3%
179	Millsholm-Ashokawna-Pomo complex, 30 to 50 percent slopes	D	15.3	3.3%
224	Speaker-Marpa-Sanhedrin gravelly loams, 30 to 50 percent slopes	C	227.2	49.2%
1690	Maymen-Etsel-Snook complex, 30 to 75 percent slopes, low ffd	D	115.9	25.1%
Totals for Area of Interest			**461.8**	**100.0%**

Rating Options—Hydrologic Soil Group (Poverty Flats Ranch)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Attachment 4:
PRISM Climate Precipitation 2000-2020

PRISM Time Series Data
Location: Lat: 39.0589 Lon: -122.7211 Elev: 2077ft
Climate variable: ppt
Spatial resolution: 4km
Period: 2000 - 2022
Dataset: AN81m
PRISM day definition: 24 hours ending at 1200 UTC on the day shown
Grid Cell Interpolation: On
Time series generated: 2023-Oct-20
Details: http://www.prism.oregonstate.edu/documents/PRISM_datasets.pdf

Date	ppt (inches)		Precip (in)
2000	34.06	Average	33.0
2001	40.77	Minimum	8.1
2002	35.57		
2003	39.88		
2004	36.43		
2005	47.15		
2006	41.94		
2007	20.5		
2008	25.17		
2009	23.23		
2010	46.28		
2011	28.92		
2012	40.13		
2013	8.12		
2014	37.52		
2015	22.53		
2016	44.35		
2017	47.45		
2018	27.71		
2019	49.21		
2020	13.16		
2021	29.43		
2022	19.02		