TECHNICAL MEMORANDUM

To: Lake County Community Development Department

From: Annjanette Dodd, PhD, CA PE #77756

Date: Revised November 26, 2025

Subject: Seigler Springs North – UP 21-17– Revised Project Information and Response to Review of May 2023 Hydrology Report prepared for UP 21-17

REGISTERED PROFESSIONAL ENGINEER ANNJANETTE DODD No. 77756 CIVIL STATE OF CALIFORNIA

The purpose of this Technical Memorandum (TM) is to provide a summary of the revised project information as it relates to water and a response to the letter from Geosyntec Consultants, dated May 8, 2024, regarding the review of the May 19, 2023 Hydrology Report and Drought Management Plan (DMP) prepared by NorthPoint Consulting Group, Inc., for the subject project.

Revised Project Description

Since the preparation of the of the May 19, 2023 Hydrology Report and DMP, the project description, related to water, has been revised as follows (Attachment 1):

1) The total canopy has been reduced from 4.0 acres to 3.0 acres.
2) Cultivation season is approximately 150 days.
3) Proposed water storage is six (6) 5,000 gallon water tanks for irrigation and one (1) 5,000 gallon water tank dedicated for fire water storage.

In addition, the DMP has been revised and is included as Attachment 2. The revisions include groundwater monitoring, water conservation practices and drought risk reductions strategies, and the project proposes to reduce cultivation during a severe drought by 0.5 acres and by 1.0 acres during an extreme drought.

Revised Water Demand

The CalCannabis Environmental Impact Report 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. This value was used in the Hydrology Report prepared for the project, dated May 19, 2023.

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, based on plant size, is 1.2 to 14.7 gallons per plant canopy square foot per year (Ascent, 2017) which equates to 290-3,560 gpd per acre of total canopy. Using the upper end of this range, the estimated demand for a 150-day outdoor cultivation season for 3.0 acres of canopy is:

- Average Daily – 10,700 gallons per day (gpd)
- Maximum Daily (September/October) – 13,500 gpd
- Yearly Total – 4.9 acre-feet per year (AFY) (1,602,000 gallons per year)

The monthly irrigation demand is summarized in Table 1.

Table 1. Estimated projected total monthly irrigation.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Irrigation (1,000 gal)	0	0	0	0	0	256	265	265	405	411	0	0	1,602

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.).

RESPONSE TO COMMENTS

Responses to Geosyntec Consultants comments are summarized below.

Geosyntec Comment #1: The estimated water use may be low. The Northpoint report projects a water use of 6.6 to 7.8 AFY assuming about 500 plants per acre. However, in a report prepared by the Konocti Consulting Group (2024, Attachment 2), they state that a more realistic number of plants per acre would be 2,000. Using this value along with the numbers provided by Northpoint, the assessment should include the range of water use from 6.6 AFY to 31.2 AFY. Using the higher value of 31.2 AFY, the daily pumping rate for 180 days would be about 39 gpm, the approximate reported calculated yield of the well, 40 gpm (see comment #2 regarding calculation of yield). The hydrology report should evaluate the project using this range of water use.

> **Response:** Water use varies depending on location, season, cultivator, cultivation methodology, number of plants, and size of plants. The CalCannabis Environmental Impact Report uses an estimate of 6.0 gallons per day per plant as an estimated water demand for cannabis cultivation. The estimate of 6.0 gpd is a largely conservative estimate for a large outdoor plant, measured in the driest period of the season, using about 500 plants per acre with a diameter of about 10 ft per plant.
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> The denser the plants are per acre, the smaller the plants will be, and the demand will be quite lower than 6.0 gpd. 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, based on plant size, is 1.2 to 14.7 gallons per plant canopy square foot per year (Ascent, 2017) which equates to 290-3,560 gpd per acre of **total canopy**. Demand for the project (see above) was estimated using the upper end of this range, which totals 4.9 AFY
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> The cultivator for this project estimates about 5,000 plants per acre with an average diameter of about 2-3 ft per plant. The demand per plant will be much less than the demand of the plants reported CalCannabis Environmental Impact Report because the plants for the proposed project will be much smaller. The proposed demand per plant would be less than a gallon per day.
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> The water demand estimate provided in Geosyntec's comment, of 31.2 AFY for four acres of outdoor cannabis, is unrealistically high and not reflective of realistic cannabis irrigation demands of the proposed cultivation style.
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> The project anticipates a peak water demand of 13,500 gpd and enough water storage for 2.2 days of irrigation water during peak demand. Per the cultivator, watering would occur every two to three days, depending on the size of plants, stage of growth, and weather conditions. A 10 gpm deep solar pump could produce the peak anticipated daily demand for the proposed cultivation operation in

about 22.5 hours, and the average anticipated daily demand for the proposed cultivation operation in 17.8 hours. Due to the watering schedule and proposed storage, the well would have about two to five days to recover between irrigation days.

Geosyntec Comment #2: The method used to estimate the yield of the proposed well is incorrect. The estimated yield of 40 gpm for the proposed well was calculated based on a 2-hour pump test conducted during installation. As noted above, the well is completed within a fractured rock system that can have initial flows of higher value but within a short amount of time can be significantly reduced. The sustainable yield for a fractured bedrock well also has to take into account the drainage of fractures and amount of time to recharge the fractures.

Response: Since the preparation of the NorthPoint 2023 Hydrology Report, the applicant has conducted a well test to confirm the well yield (Attachment 3). The 6-hour well test was conducted by Jim's Pumps on June 24th, 2024. During the Well Test the onsite groundwater well was pumped at 25 gpm for 6-hours while the water level within the well was measured and recorded every 15 to 30 minutes. Prior to the start of the well test the static water level was measured at 227 feet below ground surface (bgs). The water level dropped to 232 feet bgs within 15 minutes after initiating pumping, where it stabilized for the entire duration of the 6-hour test. The water level within the onsite groundwater well recovered quickly, to 227 feet below ground surface within 15 minutes after cessation of pumping, confirming a yield of at least 25 gpm.

Geosyntec Comment #2 Continued: As outlined in California Code of Regulations, Title 22, Section 64554(g)(2), to determine sustained yield of a well drilled in a fractured system two pump tests methods can be used: a 72-hour test and a 10-day test. For each of these tests, if the well has not recovered within a length of time not exceeding the duration of the pumping time of the pumping test (72 hours or 10 days), to within two feet of the static water level measured at the beginning of the well capacity test or to a minimum of ninety-five percent of the total drawdown measured during the test, whichever is more stringent, the well capacity cannot be determined using the proposed pump discharge rate. If the pump test meets these requirements, then 25 percent of the pumping rate would be the representative well capacity for a 72-hour test and 50 percent of the pumping rate for a 10-day test. Although these methods are required for drinking water wells by the State Water Resources Control Board, Division of Drinking Water, Santa Rosa (Attachment 3), to ensure the proposed project well will not drain fractures within the aquifer system, a similar test should be conducted to establish the appropriate well capacity.

Response: The California Code of Regulations (CCR), Title 22, Section 64554(g)(2) does not apply to irrigation wells. Section 64554 of Title 22 covers new and existing source capacity determination for public water systems, where the purpose is to demonstrate an adequate water supply for the public water system and NOT to ensure the proposed project well will not drain fractures within the aquifer system. In addition, Lake County does not require this level of testing for cannabis projects, the standard has been a 4-hour pump test. This project conducted a 6-hour pump test, demonstrating a yield of 25 gpm.

Additionally, Article 27 Section 27.11 of the Lake County Zoning Ordinance requires commercial cannabis cultivators using water from a groundwater well to install a water level monitor on their water supply well, and to regularly record readings from the continuous water level monitor. The proposed project will use an ENO Scientific Well Watch 670 continuous water level monitor to monitor and record the water level of the onsite groundwater well 24 hours a day, 365 days a year (Attachment 2). The project will use water level data from the continuous water level monitor to ensure that the project is not overdrawing from the aquifer.

Geosyntec Comment #3: As discussed above, the aquifer storage was calculated by multiplying the area of volcanic rock unit (640 acres) by the thickness of the aquifer (calculated based on difference between static water levels and well depths) by the specific yield (approximate open spaces for water in rock unit estimated at 0.07). First, even if this was a porous media such as a sand unit, the calculation is wrong. As shown in Table 1, the aquifer system is confined, and the reported static water levels represent a pressure head that is above the aquifer system. As such, the actual aquifer thickness is at least 20 to 51 feet smaller than the 112 feet calculated for the project. Secondly, the specific yield within a porous media approximately represents the effective porosity of the material or open space that water can move through. Within a fractured rock system, this value is based on the nature of the fracture (e.g. open, closed, filled) and connection with other fractures and is almost certainly not the 0.07 value used for the calculation. In fractured rock systems as occurs at the site, only a small number of fractures may be filled with water.

To assess the amount of fractures that contain water, a test hole should be completed, and an acoustic televiewer (to assess number and orientation of fractures) and heat pulse flow meter conducted to assess which fractures transmit water. An example of both these methods are shown in Figures 3 (acoustic/optical televiewer) and 4 (heat pulse televiewer). As seen in these figures, although many fractures may be present, only a small amount are producing water. At the site these measurements were taken near Quincy California, recognition of these features was critical in protecting a supply well for a small hotel.

Based on the information provided above, the actual groundwater storage within the aquifer beneath the proposed project is significantly less than reported and possibly orders of magnitude lower. If this information is not assessed, significant impacts could occur through the drying up of fractures as is discussed further in Comments 4 and 5.

Response: The area of the aquifer was estimated as 670 acres. The thickness was estimated as the difference between the average well depth and average depth to static water level of the wells within the aquifer unit, which is a commonly used to estimate aquifer thickness and the specific yield represents the amount of water that can be released from an unconfined aquifer. To obtain the approximate storage, the NorthPoint 2023 Hydrology Report used a specific yield of 7% to represent volcanic aquifers, which was sourced from similar studies. To address this comment from Geosyntec, a range in values for the specific yield (effective porosity) was obtained from literature values for shale/stone, ranging between 0.09% to 0.9% (Heath, 1983 and Morris and Johnson 1967) and the project's total parcel area, 84.6 acres, was used to estimate the project's contributing storage capacity.

- Aquifer Area: 84.6 acres
- Aquifer Thickness: 40ft (Geosyntec) to 112 ft (NorthPoint)
- Specific Yield: 0.09% to 0.9%
- Average Approximate Storage Capacity: 32 AF

The annual water demand for the project is 4.9 AF, which is less than the estimated storage capacity of the portion of the aquifer beneath the project area. In addition, the project proposes continuous groundwater level monitoring to monitor the water availability and storage availability of the aquifer from which the well draws to avoid overdrawing from the aquifer.

Geosyntec Comment #4: The method used to calculate aquifer recharge is incorrect. Aquifer recharge was calculated by assuming that a portion of precipitation at the surface would migrate down to aquifer system. As discussed above, the aquifer system is a confined system and waters from the surface would have to migrate down through the over 300 feet of low permeability rock overlying the aquifer system. In addition, recharge water needs to be at locations where the open fractures are that are connected to the overall aquifer system. The recharge system for this unit is most likely miles away from the project site.

The appropriate way to estimate recharge to aquifer is through the pumping tests discussed under Comment 2. Through this test if water levels do not recover to the starting water levels before the pump test, then there is poor connection between fractures that would recharge the area in which case water levels would decline every time the pump is turned on resulting in continued drying of individual fractures. For the same reasons discussed above for Comment 3, the actual recharge to the aquifer beneath the proposed project is significantly less than reported.

> **Response:** Although Geosyntec provides an assertion that the recharge is less than reported, Geosyntec does not provide an alternative estimate to refute the estimate provided by the May 2023 Hydrology Report. The May 2023 Hydrology Report provides multiple estimates of recharge, one based on the assumption that recharge is primarily from precipitation percolating or infiltrating down from the ground surface within the recharge area. However, it is recognized that confined aquifers are generally recharged where the aquifer materials are exposed at the surface (e.g. rock outcrop areas), thus another method for estimating recharge was also used and is based on estimates determined by the USGS (USGS Fact Sheet 2007-3007). Over the project's parcel 84.6-acre area this would equate to 6.4 – 42.1 AFY during a dry year (precipitation = 9.1 inches) and 35.4 – 234 AFY during an average year (precipitation = 50.3 inches). To be conservative, the lowest recharge estimates for a dry and average year were used, which are 6.4 AFY to represent a drought year and 30.1 AFY to represent an average year. Assuming a drought year occurs on average every 5-years, the project's parcel contribution to the 5-year average annual recharge would be 25.4 AFY over the 84.6-acre parcel area. The lowest total precipitation over a 5-year period since 2000 occurred from 2011 through 2015; the estimated average annual recharge over this period, based on 10% of the precipitation and the project parcel area, is 26.3 AFY. Thus, there is sufficient recharge to meet the project's demand of 4.9 AF per year.

Geosyntec Comment #5: An adequate assessment of cumulative impacts to other water uses in the area was not provided. To provide an accurate assessment of cumulative impacts to the surrounding area, first the orientation and dip of the producing fractures must be known. This information can be obtained by use of the optical televiwer and heat pulse flow meter discussed for Comment 3. For example, if the producing fractures trend towards the northeast or southeast, then pumping on the proposed project well could have significant impact to the existing wells at the Mountain of Attention property.

> **Response:** A cumulative impacts assessment was provided for the project's well use. In addition, the project proposes continuous groundwater level monitoring to monitor the water availability and storage availability of the aquifer from which the well draws to avoid overdrawing from the aquifer.
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> Per Geosyntec's comment letter, The Mountain of Attention Sanctuary operated by the Adidam Holy Domains has multiple wells and the nearest well operated by the Mountain of Attention is located 2,921 feet to the west of the proposed project. The radius of influence of the project well was estimated using the Theis equation (Fetter, 2001). The Theis equation was developed to model the response of a confined aquifer to pumping. Using the Theis equation, the drawdown at a specific distance from each well can be estimated based on the project's maximum irrigation pumping

demand, 10 gpm, over a duration of 22 hours (Attachment 4). The radius of influence is the distance where the modeled cone of depression from groundwater extraction (drawdown) under these conditions is negligible (less than 6-inches), which is less than 200 feet from the project well (Figure 1), over 2,700 ft (0.5 miles) from the Mountain of Attention Sanctuary wells.

Geosyntec Comment #5 Continued: In addition, until assessments are made on what the actual well capacity and aquifer recharge values are, operation of this well could dry out fractures in the area also resulting in significant impacts to nearby groundwater wells. Anecdotal information already suggests that fractures may be drying out and not being recharged. Attachment 4 provides two reports from adjacent properties. The first report is a summary of operations of four existing wells at the Mountain of Attention (Figure 1). As indicated in this report, pumping conducted years ago on a specific well (date not specified), supplied 80 gpm, 24-hours a day, 7-days a week. For a test conducted in July 2021, this well only supplied water at 80 gpm 6-hours a day before the well went dry. The well did recharge so that it could be pumped the next day. The second report is a memo from Timothy Toye, a local real estate broker, who indicates knowledge of two wells in the area that have dried up. Both of these reports strongly suggest that the system is being over pumped and not allowing recharge to occur.

Response: Attachment 4 referenced by Geosyntec does provide enough information regarding the wells at Mountain of Attention and why they went dry. There are many reasons a well can go dry, construction issues, over pumping, maintenance, seasonal fluctuations, pump installation level, location, etc. Of the four existing wells at the Mountain of Attention, the report indicated that the other three wells are still working and providing water. Also, the wells are over 2,700 feet away from the project well. The information provided does not provide evidence that the project well would go dry. In addition, as discussed previously, the project proposes continuous groundwater level monitoring.

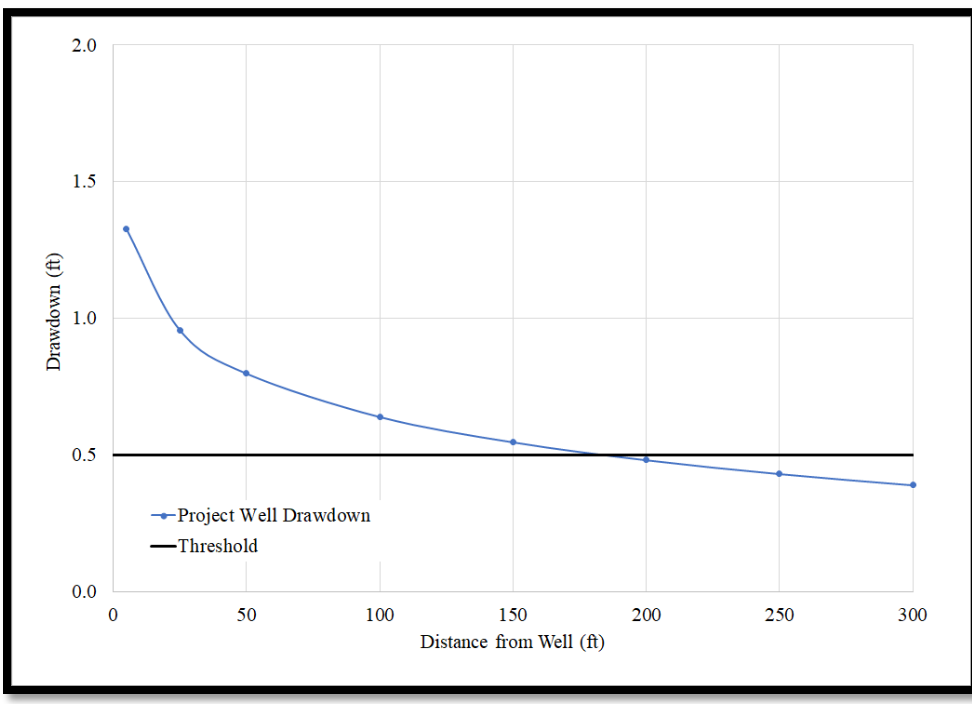

Figure 1. Estimated radius of influence (distance) associated with the project's well (Threshold = 6-inches).

Geosyntec Comment #5 Continued: The report also did not assess the presence of springs in the area that could be sourced from this aquifer system. A map showing where springs are located and study to assess potential impacts to these features needs to be completed and if impacts affect surface water flows. In addition, the geologic map provided in the Northpoint report indicates there are faults in the area including one that goes through the project area. The impact on water movement from these faults should be assessed for this project.

Response: The USGS topographic maps indicate a spring approximately 500 feet west of the well. The Biological Resources Assessment prepared by Natural Investigations (dated November 2020) for the project did not identify any springs on site and stated that, "a spring is indicated on the USGS topo map, but no spring could be found at the top of the watercourse". That being said, the location of the spring is located outside of the radius of influence of the well. The surface elevation of the spring is approximately 325 feet above the screened interval of the well, which starts at an elevation of approximately 2,310 ft and ends at an elevation of approximately 2,250 ft, well below the elevations of the ephemeral streams in the vicinity of the project parcels (Figure 2). The project well extracts water from a confined volcanic water bearing unit, well below surface water, and is a non-diversionary water source.

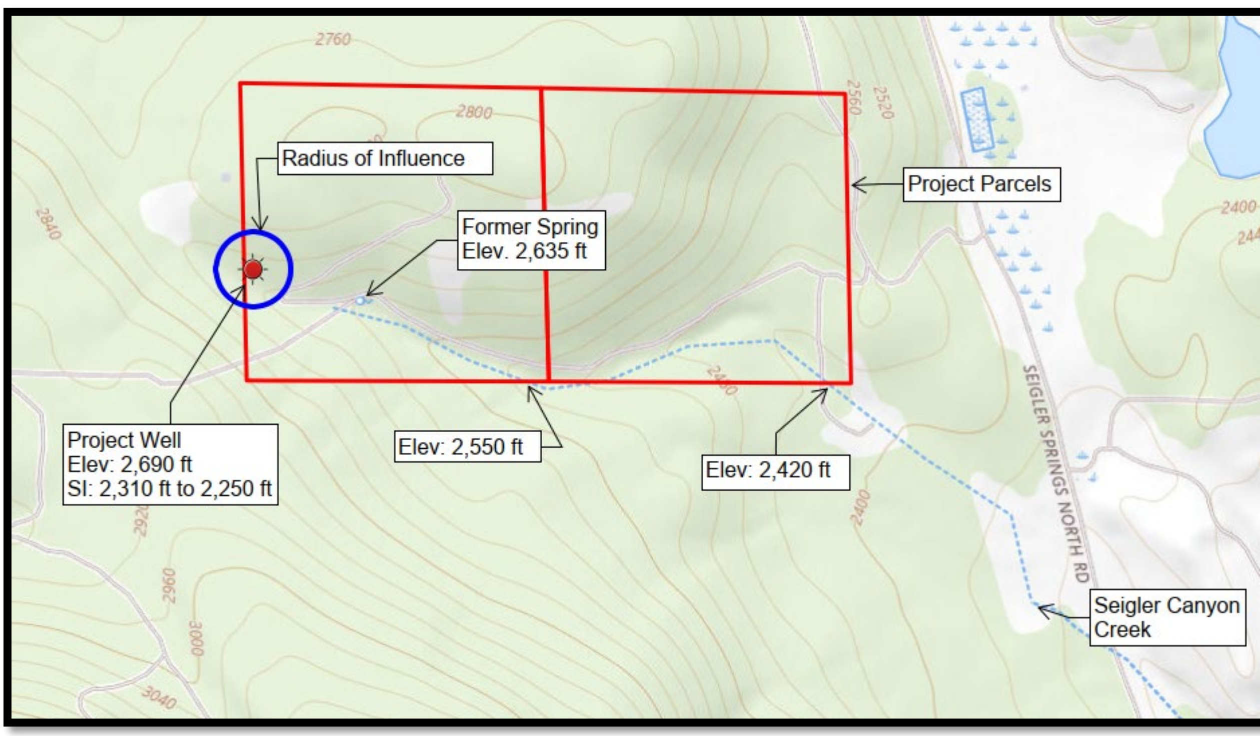

Figure 2. Screened well interval (SI) elevations and ground surface elevations.

Attachments

Attachment 1 – Revised Project Description
Attachment 2 – Revisions to Drought Management Plan
Attachment 3 – Well Capacity Test Results
Attachment 4 – Drawdown Calculations

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 over 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.

References

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ATTACHMENT 1 – REVISED PROJECT DESCRIPTION

PROJECT DESCRIPTION

Seigler Springs Holdings, LLC is seeking a Major Use Permit from the County of Lake for a proposed Commercial Cannabis Cultivation Operation at 11615 Seigler Springs North Road near Kelseyville, CA on Lake County APN 115-007-03 (Project Parcel). The proposed cultivation operation would be composed of three A-Type 3 "Medium Outdoor" cultivation areas, with a combined total canopy area of up to 130,680 ft^2 (3 acres) within a 4-acre outdoor cultivation area. Proposed ancillary facilities include six 5,000-gallon water storage tanks, two 320 ft^2 metal shipping/storage containers, an 800 ft^2 composting area, a 225 ft^2 trash enclosure, a 5,000-gallon metal or fiberglass fire water storage tank, and an ADA-compliant portable restroom. All water for the proposed cultivation operation would come from an existing onsite groundwater well located at Latitude: 38.88286° and Longitude: -122.70609°.

The Project Property is composed of two parcels totaling approximately 84.5 acres (Lake County APNs 115-007-03 & 06), both of which are owned by Seigler Springs Holdings, LLC. The Project Property is located approximately 4.5 miles southwest of the town of Lower Lake, CA and immediately north of Seigler Mountain. The Project Property is accessed via a private gravel and native soil surfaced access road off of Seigler Springs North Road. A metal gate controls access to the private gravel and native soil surfaced access road of the Project Property from Seigler Springs North Road. Pacific Gas & Electric high voltage overhead powerlines traverse the Project Property from southwest to northeast, passing within approximately 600 feet south of the proposed cultivation operation.

Topography of the Project Property is dominated by an east-west trending ridgeline, with elevations that range from approximately 2,450 to 2,815 feet above mean sea level. Seigler Canyon Creek, the only surface water body on the Project Property, flows from west to east through the southern half of the Project Property. The proposed cultivation operation will be located over 500 feet north of Seigler Canyon Creek.

Development of the proposed cultivation operation would result in the disturbance of approximately 4 acres of ponderosa pine and black oak habitat, including the removal of 76 mature black oak trees (+6" DBH). A +20-acre No Development Zone will be established in the southern half of the Project Property, to mitigate for the four acres of ponderosa pine and black oak habitat disturbed as a result of developing the proposed cultivation operation. Additionally, more than three hundred and twenty-seven (327) black oak saplings will be planted, cared for, and protected for seven years, in areas surrounding the proposed cultivation operation, to mitigate for the black oak trees lost as a result of project/site development.

The proposed outdoor cultivation area will be enclosed with 6-foot tall galvanized woven wire fences. Locking metal gates will control access to the proposed cultivation area, and the metal gates will be locked whenever cultivation personnel are not present. The growing medium of the proposed outdoor cultivation area will be an amended native soil mixture, with drip irrigation systems and mulch to conserve water resources. The total canopy area of the proposed cultivation operation will be reduced from 130,680 ft^2 (3 acres) to 87,120 ft^2 (2 acres) during periods of extreme/exceptional drought. A nitrogen-fixing cover crop would be planted in the proposed outdoor cultivation area each fall immediately following harvest. The nitrogen-fixing cover crop would be tilled into the native soil of the proposed outdoor cultivation area in June of each year, prior to planting.

Solid waste generated from the proposed cultivation operation will be transported weekly to the Eastlake Landfill and/or Lake County Transfer and Recycling Facility. All cannabis waste generated from the proposed cultivation operation will be chipped and composted onsite. Composted cannabis waste will be stored in the designated composting area, until it is incorporated into the growing medium of the outdoor cultivation area, as an organic soil amendment. All agricultural chemicals (fertilizers, amendments, pesticides, and petroleum products) will be stored within one of the two proposed metal shipping/storage containers (Pesticide & Agricultural Chemicals Storage Area). Only California Department of Food and Agriculture Registered Organic Input Material fertilizers and amendments will be used by the proposed cultivation operation. Only pesticides approved by the California Department of Pesticide Regulation for use on cannabis would be used.

The proposed cultivation operation will adhere to the inventory tracking and recording requirements of the California Cannabis Track-and-Trace (CCTT) system. All staff will be trained in the requirements of the CCTT system, and a member of the managerial staff will be the designated track-and-trace system administrator. The designated track-and-trace system administrator will complete an initial training provided by the California Department of Cannabis Control and will participate in ongoing training as required. All cannabis transfers/movement will be reported through the CCTT system, and a track-and-trace system administrator will supervise all tasks with high potential for diversion/theft.

Self-Distribution

Seigler Springs Holdings, LLC is also seeking to obtain a Type 13 Cannabis Distributor Transport Only, Self-Distribution license, so that the proposed cultivation operation could use an unmarked, registered, and insured vehicle to transport cannabis to licensed cannabis processing, distribution, and manufacturing facilities throughout the State of California. The distribution vehicle will only travel from the Project Property to the premises of licensed cannabis processing/distribution/ manufacturing facilities, and back to the Project Property. The vehicle will be locked and secured whenever it is not being loaded or unloaded, and it will never be left unattended while transporting cannabis. The reporting requirements of the California Cannabis Track-and-Trace system will be adhered to at all times, to record and report all cannabis transfers and movements.

Water Resources Protection

The cultivation season for the proposed cultivation operation would begin in June and end in October of each year (approximately 150 days). The applicant will tie the amount of canopy cultivated to the first USDA California Climate Hub Drought Monitor Map of June of each year. If the area of the Project Property is identified as under a Severe Drought on the first Drought Monitor Map of June, then only 108,900 ft^2 (2.5 acres) of canopy will be cultivated that year. If the area of the Project Property is identified as under an Extreme or Exceptional Drought on the first Drought Monitor Map of June, then only 87,120 ft^2 (2 acres) of canopy will be cultivated that year. The proposed cultivation operation is estimated to require between 3,000 and 3,560 gallons of water per day on average per acre of canopy. The table below outlines the anticipated water usage of the proposed cultivation operation during normal operations, as well as during drought years.

Anticipated Water Usage

	Acres Cultivated	June	July	August	September	October	Annual
		Water Usage (Gallons)					
Normal Operations	3	216,000 - 256,000	223,000 - 265,000	223,000 - 265,000	342,000 - 405,000	346,000 - 411,000	1,350,000 - 1,602,000
Severe Drought	2.5	180,000 - 214,000	186,000 - 221,000	186,000 - 221,000	284,000 - 337,000	289,000 - 342,000	1,125,000 - 1,335,000
Extreme/Exceptional Drought	2	144,000 - 171,000	149,000 - 177,000	149,000 - 177,000	227,000 - 269,000	231,000 - 274,000	900,000 - 1,068,000

Anticipate Annual Water Usage Calculations

Normal Operations

3 Acres X 3,000 Gallons per Day X 150 Days = 1,350,000 Gallons per Year

3 Acres X 3,560 Gallons per Day X 150 Days = 1,602,000 Gallons per Year

Severe Drought

2.5 Acres X 3,000 Gallons per Day X 150 Days = 1,125,000 Gallons per Year

2.5 Acres X 3,560 Gallons per Day X 150 Days = 1,335,000 Gallons per Year

Extreme/Exceptional Drought

2 Acres X 3,000 Gallons per Day X 150 Days = 900,000 Gallons per Year

2 Acres X 3,560 Gallons per Day X 150 Days = 1,068,000 Gallons per Year

Water Availability Analysis

A Well Test was performed of the onsite groundwater well by Jim's Pumps (License No. 993066) on June 24th, 2024. During the Well Test the onsite groundwater well was pumped at 25 gallons per minute for six hours while the water level within the well was measured and recorded every 15 to 30 minutes. Prior to the start of the Well Test the water level within the onsite groundwater well was 227 feet below ground surface. The water level dropped to 232 feet below ground surface within 15 minutes after pumping began, where it stabilized for the entire duration of the 6-hour Well Test. The water level within the onsite groundwater well rebounded to 227 feet below ground surface within 15 minutes following the 6-hour Well Test. Therefore, there is no doubt that the onsite groundwater well can produce at least 25 gallons per minute.

The peak anticipated water demand for the proposed cultivation operation during normal operations is approximately 13,500 gallons per day, and the average anticipated water demand during normal operations is approximately 10,700 gallons per day. At 25 gallons per minute, the onsite groundwater well could produce the peak anticipated daily demand for the proposed cultivation operation in 9 hours, and the average anticipated daily demand for the proposed cultivation operation in 7 hours and 8 minutes. Additionally, 30,000 gallons of water storage capacity are proposed on the Project Property for irrigation. The existing onsite groundwater well is a sufficient water supply source for the proposed cannabis cultivation operation.

ATTACHMENT 2 – REVISIONS TO DROUGHT MANAGEMENT PLAN

REVISED DROUGHT MANAGEMENT PLAN

SEIGLER SPRINGS NORTH CULTIVATION PROJECT
MAJOR USE PERMIT APPLICATION UP 21-17

11615 & 11625 Seigler Springs North Road
Kelseyville CA 95451
Lake County APNs 115-007-03 & 06

November 17th, 2025

The Urgency Ordinance approved by the Lake County Board of Supervisors on July 27th, 2021 (Ordinance No. 3106) requires applicants to provide a plan depicting how the applicants plan to reduce water use during a declared drought emergency. The proposed commercial cannabis cultivation operation would be composed of up to 130,680 ft^2 (3 acres) of combined cannabis canopy within a 4-acre outdoor cultivation area. All water for the proposed cultivation operation would come from an existing onsite groundwater well located at Latitude: 38.88286° and Longitude: -122.70609°.

A revised Ordinance 3106 Hydrology Report was prepared by Northpoint Consulting Group, Inc. in May of 2023, estimating that the proposed cultivation operation would have an annual water demand of 6.6 acre-feet (2,160,000 gallons). The water usage assumptions of the Ordinance 3106 Hydrology Report are based on 4 acres (174,240 ft^2) of outdoor canopy area over a 180-day cultivation season (April – October). However, this does not reflect the current cultivation plan of no more than 3 acres (130,680 ft^2) of outdoor cannabis canopy area over a 150-day cultivation season (June – October). As a result projected annual water usage for the current cultivation plan is expected to be significantly less than the stated yearly usage (supporting information and calculations are outlined in the Drought Emergency Response section of this document).

STATE & COUNTY WATER CONSERVATION AND MONITORING REQUIREMENTS

Per the Water Conservation and Use requirements outlined in the State Water Resources Control Board's Cannabis General Order, the Applicant shall implement the following Best Practical Treatment and Control (BPTC) measures to conserve water resources:

- Regularly inspect the entire water delivery system for leaks and immediately repair any leaky faucets, pipes, connectors, or other leaks;
- Apply weed-free mulch in cultivation areas that do not have ground cover to conserve soil moisture and minimize evaporative loss;
- Implement water conserving irrigation methods (drip or trickle and micro-spray irrigation);
- Maintain daily records of all water used for irrigation of cannabis. Daily records will be calculated by using a measuring device (inline water meter) installed on the main irrigation supply line between the water storage area and cultivation area(s);
- Install float valves on all water storage tanks to keep them from overflowing onto the ground.

With the Water Conservation and Use requirements outlined above, the proposed cultivation operation would efficiently use water resources at all times. Additionally, Article 27 Section 27.11 of the Lake County Zoning Ordinance requires commercial cannabis cultivators using water from a groundwater well to install a water level monitor on their water supply well, and to regularly record readings from the continuous water level monitor. Seigler Springs Holdings (SSH) will use an ENO Scientific Well Watch 670 continuous water level monitor to monitor and record the water level of the onsite groundwater well 24 hours a day, 365 days a year. SSH will use water level data from the continuous water level monitor to ensure that we are not overdrawing the aquifer, which would be catastrophic for the proposed cultivation operation.

ENO Scientific Well Watch 670 Continuous Water Level Monitor

DROUGHT MANAGEMENT STRATEGIES

Independent of meeting State of California and County of Lake regulatory requirements, SSH is committed to the long-term sustainability of our farm and our surrounding neighbors' water resources. SSH plans to implement drought management practices that reduce water waste, including limiting consumption and evaporation while minimizing runoff.

All employees will be trained in SSH's Standard Operating Procedures (SOPs) pertaining to drought management. These SOPs will be reviewed and updated annually, taking into account any regulatory compliance and amendments required by the State of California or County of Lake. In addition, SSH will review and assess both present and historical water data at the county and state levels, to make informed decisions about upcoming farming seasons. All employees will undergo ongoing training as the SOPs are updated at a minimum on an annual basis.

SSH will strategically plant seasonal drought-tolerant cover crops using organic soil amendments and composts to help the farm adapt to and recover from drought conditions. This process will significantly reduce water use in subsequent farming seasons due to a significant increase in soil organic matter, resulting in higher concentrations of water retention and overall soil health. SSH plans to build an organic farm that integrates cultural, biological, and mechanical means to conserve biodiversity, cycle its recourses and foster an ecological balance in all aspects of the farm.

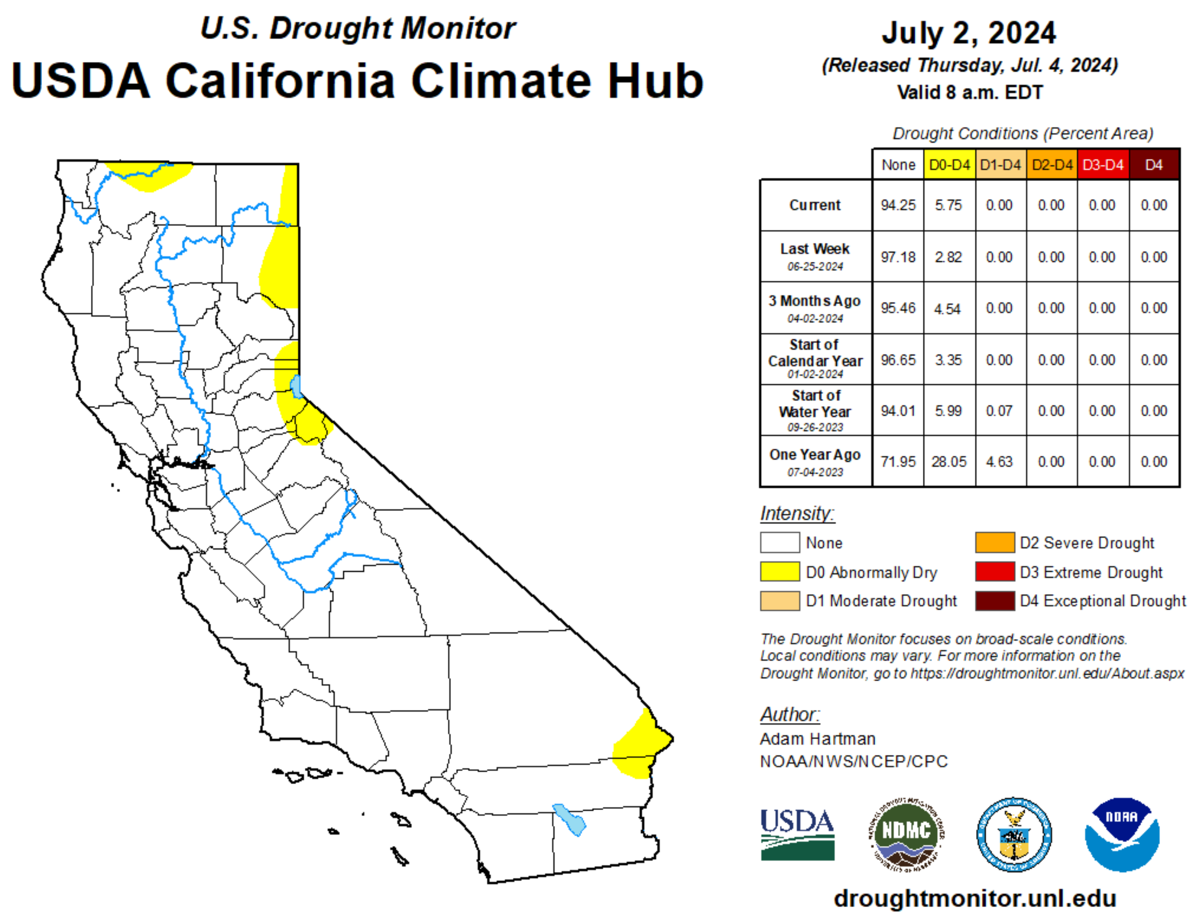
DROUGHT RISK REDUCTION STRATEGIES

SSH is dedicated to responsible water use on its farm. Part of this responsibility includes small but meaningful improvements to increase drought resilience and preparedness. The first strategy is to utilize forecasting tools via data from weather stations in the California Irrigation Management Information System (CIMIS) to make informed production decisions during and before the crop cycle. Additionally, SSH will invest in organic improvements and actions that enhance the soil's moisture retention capacity through a variety of management practices that increase soil organic matter while reducing soil-moisture loss, such as: no-till or reduced tillage farming systems, crop area mulching, and the use of seasonal drought-tolerant cover crops. Finally, only highly efficient drip irrigation systems will be used for all water that is applied to the amended native soils of the proposed canopy areas.

DROUGHT EMERGENCY RESPONSE

SSH will actively monitor the USDA California Climate Hub Drought Monitor Map prior to and throughout each cultivation season to take progressive action prior to the declaration of a drought emergency. The USDA California Climate Hub Drought Monitor Map identifies areas of the State in drought and labels them by intensity: D0 – Abnormally Dry, D1 – Moderate Drought, D2 – Severe Drought, D3 – Extreme Drought, and D4 – Exceptional Drought.

USDA California Climate Hub Drought Monitor Map for July 2, 2024



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	94.25	5.75	0.00	0.00	0.00	0.00
Last Week 06-25-2024	97.18	2.82	0.00	0.00	0.00	0.00
3 Months Ago 04-02-2024	95.46	4.54	0.00	0.00	0.00	0.00
Start of Calendar Year 01-02-2024	96.65	3.35	0.00	0.00	0.00	0.00
Start of Water Year 09-26-2023	94.01	5.99	0.07	0.00	0.00	0.00
One Year Ago 07-04-2023	71.95	28.05	4.63	0.00	0.00	0.00

Staff will be alerted to dry/drought conditions and provided additional education/training to ensure water conservation practices are adhered to when the area of the farm is identified as being under D0 – Abnormally Dry or D1 – Moderate Drought conditions.

When the area of the farm is identified as being under D2 – Severe Drought conditions on the first Drought Monitor Map of June, then only 108,900 ft^2 (2.5 acres) of canopy will be cultivated that year.

When the area of the farm is identified as being under D3 – Extreme Drought or D4 – Exceptional Drought on the first Drought Monitor Map of June, then only 87,120 ft^2 (2 acres) of canopy will be cultivated that year.

The voluntary canopy reductions outlined above, along with additional water conservation practices, will significantly reduce the farm's water use during periods of drought. An average water use requirement of 3,000 to 3,560 gallons per day per acre of canopy were used in the Hydrology Report and Technical Memorandum prepared for the proposed cultivation operation. The table and calculations below outline the anticipated water usage of the proposed cultivation operation during normal operations, as well as during drought years, at 3,000 to 3,560 gallons per day per acre of canopy for a 150-day cultivation season.

Anticipated Water Monthly and Annual Usage

	Acres Cultivated	June	July	August	September	October	Annual
		Water Usage (Gallons)					
Normal Operations	3	216,000 - 256,000	223,000 - 265,000	223,000 - 265,000	342,000 - 405,000	346,000 - 411,000	1,350,000 - 1,602,000
Severe Drought	2.5	180,000 - 214,000	186,000 - 221,000	186,000 - 221,000	284,000 - 337,000	289,000 - 342,000	1,125,000 - 1,335,000
Extreme/Exceptional Drought	2	144,000 - 171,000	149,000 - 177,000	149,000 - 177,000	227,000 - 269,000	231,000 - 274,000	900,000 - 1,068,000

<u>Normal Operations</u>

3 Acres X 3,000 Gallons per Day X 150 Days = 1,350,000 Gallons per Year

3 Acres X 3,560 Gallons per Day X 150 Days = 1,602,000 Gallons per Year

<u>Severe Drought</u>

2.5 Acres X 3,000 Gallons per Day X 150 Days = 1,125,000 Gallons per Year

2.5 Acres X 3,560 Gallons per Day X 150 Days = 1,335,000 Gallons per Year

<u>Extreme/Exceptional Drought</u>

2 Acres X 3,000 Gallons per Day X 150 Days = 900,000 Gallons per Year

2 Acres X 3,560 Gallons per Day X 150 Days = 1,068,000 Gallons per Year

ATTACHMENT 3 – WELL CAPACITY TEST RESULTS

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

WELL TEST REPORT

JOB Forest Nikola SIZE TURBINE 3 HP (Test Pump)
LOCATION 1615 Seigler Springs Rd Kelseyville Ca SETTING 302 ft
WELL DEPTH 440 ft CASING SIZE 4½ in STATIC LEVEL 227 ft
DATE STARTED 6-24-24 DATE COMPLETED 6-24-24

DATE	TIME A.M.	TIME P.M.	OPERATOR	G.P.M.	DRAWDOWN	WATER COLOR
6-24-24		12:00	Ben	25	227 ft	Clear
		12:15		25	232 ft	
		12:30		25	232 ft	
		12:45		25	232 ft	
		1:00		25	232 ft	
		1:30		25	232 ft	
		2:00		25	232 ft	
		2:30		25	232 ft	
		3:00		25	232 ft	
		3:30		25	232 ft	
		4:00		25	232 ft	
		4:30		25	232 ft	
		5:00		25	232 ft	
		5:30		25	232 ft	
		6:00	End Run Time	25	232 ft	
		6:00	Start Recovery	0	232 ft	
		6:01	End Recovery	0	227 ft	
			End Test			

COMMENTS: At this time we feel this well is capable of (25 Gpm). Note: All results are subject to change depending on time of year & weather conditions.

[signature]

ATTACHMENT 4 – DRAWDOWN CALCULATIONS

	Seigler Project Well								Notes:
Storativity	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	Storativity - Average of Minimum and Maximum in range (see below)
Well Drawdown (ft)	5	5	5	5	5	5	5	5	Drawdown during pump test
Yield Q (gpm)	25	25	25	25	25	25	25	25	Pump rate during pump test
SC Specific Capacity	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	Well Yield / Available Drawdown
T (gpd/ft)	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0	10000.0	Driscoll's (1968) Estimate for confined aquifer of T = 2000*SC
T (ft^2/day)	1336.8	1336.8	1336.8	1336.8	1336.8	1336.8	1336.8	1336.8	gallon = 0.133681 cubic foot
Project Q (gpm)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	Based on 24 hour storage refill rate during maximum daily demand
Q (ft^3/d)	1925	1925	1925	1925	1925	1925	1925	1925	conversion ft^3/d = 0.00519481 gpm
Time (days)	0.916666667	0.916666667	0.9166667	0.9166667	0.9166667	0.9166667	0.9166667	0.9166667	
r (ft)	5.0	25	50	100	150	200	250	300	
u	0.00001	0.00013	0.00053	0.00211	0.00476	0.00845	0.01321	0.01902	Fetter (2001) Equation 5.10
w(u)	11.5736	8.3549	6.9690	5.5843	4.7760	4.2043	3.7628	3.4039	Fetter (2001) Equation 5.11: W(u) ~ -0.5772-ln(u)+u-u^2/(2*fact2)
Drawdown [h-ho] (ft)	1.3	1.0	0.8	0.6	0.5	0.5	0.4	0.4	Fetter (2001) Equation 5.11
Drawdown [h-ho] (in)	15.9	11.5	9.6	7.7	6.6	5.8	5.2	4.7	

Sources: Applied Hydrogeology, Fourth Edition, C.W. Fetter. 2001
Groundwater Wells, Second Edition, F.G. Driscoll 1986. (https://sehydrogeology.com/using-specific-capacity-monitor-well-performance/#:~:text=The%20Specific%20Capacity%20of%20a,penetrated%20by%20the%20well%20screens.)

Storativity - Confined Aquifer (Sources)

	Minimum	Maximum	Average	
	0.00005	0.005	**0.0010**	Average of all six estimates of Storativity
Estimated Aquifer Thickness	0.00001	0.0001		
Based on Well log 20 ft	0.00002	Aquifer Thickness*0.000001		

Source: http://www.aqtesolv.com/aquifer-tests/aquifer_properties.htm

aquifer (or aquitard) thickness [L].

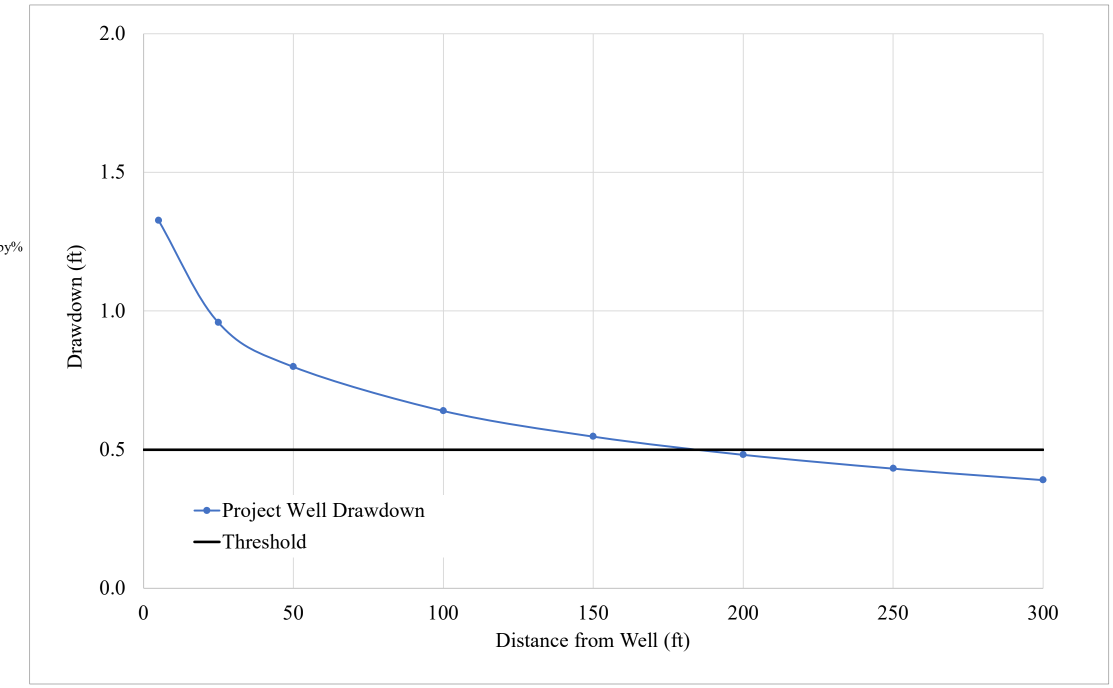
The typical storativity of a confined aquifer, which varies with specific storage and aquifer thickness, ranges from 5×10^{-5} to 5×10^{-3} (Todd 1980).

Specific storage is the volume of water that a unit volume of aquifer (or

Source: https://www.sciencedirect.com/topics/earth-and-planetary-sciences/transmissivity#:~:text=For%20confined%20aquifers%20the%20storativity,the%20aquifer%20thickness%20by%200.000001.

from the expansion of water and compaction of the aquifer, both of which are exceedingly small. For confined aquifers the storativity generally ranges between 0.0001 and 0.00001, and for leaky confined aquifers it is in the range of 0.001. One method to estimate storativity for confined aquifers is to multiply the aquifer thickness by 0.000001. The small storativity for confined aquifers means that to obtain a sufficient supply from a well there must be a large pressure change throughout a wide area. This is not the case with unconfined aquifers because the water derived is not related to expansion and compression but comes instead from gravity drainage and dewatering of the aquifer.

Radius of influence is distance from well where drawdown is negligable.



TECHNICAL MEMORANDUM

To: Lake County Community Development Department

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

Date: Revised May 19, 2023 (supersedes any Technical Memorandum prepared prior to this date)

Subject: Ordinance 3106 Hydrology Report and Drought Management Plan – UP 21-17, Seigler Springs North Cultivation Project 11615 and 11625 Seigler Springs North Road, Kelseyville CA 95451 (Cultivation APNs: 115-007-03, 115-007-06)

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 UP 21-17, Seigler Springs North Cultivation Project (project). 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 11615 and 11625 Seigler Springs North Road, Kelseyville CA 95451 (Cultivation APNs: 115-007-03 and 115-007-06). The site is accessed by private driveway off Seigler Springs North Road, approximately 11 miles southeast of Kelseyville, CA (Figure 1).

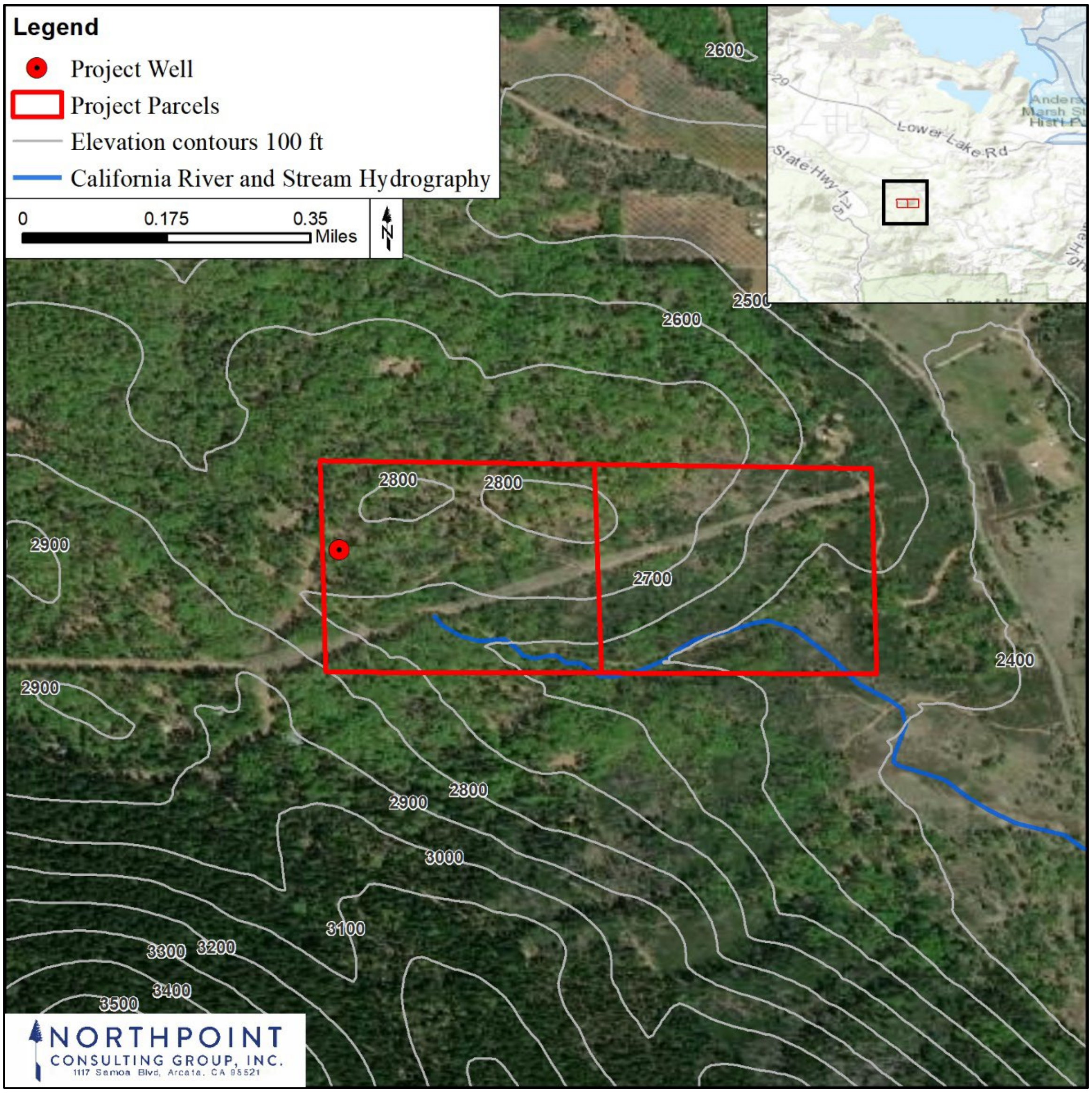


Figure 1: Property Location

Proposed Project

The proposed project is to permit commercial cannabis cultivation in accordance with the Lake County Zoning Ordinance (Article 27). The project property is 84.6 acres and is comprised of two APNs: 115-007-03 (42.5 acres) and 115-007-06 (42.1 acres). The proposal is for 4.0-acres of outdoor canopy area. The proposal is to cultivate in outdoor full sun or in temporary hoop houses using light deprivation with a cultivation period of approximately 150 to 180 days. The proposal also includes the development of onsite storage facilities appurtenant to cultivation, as well as appropriate irrigation infrastructure. (Figure 2)

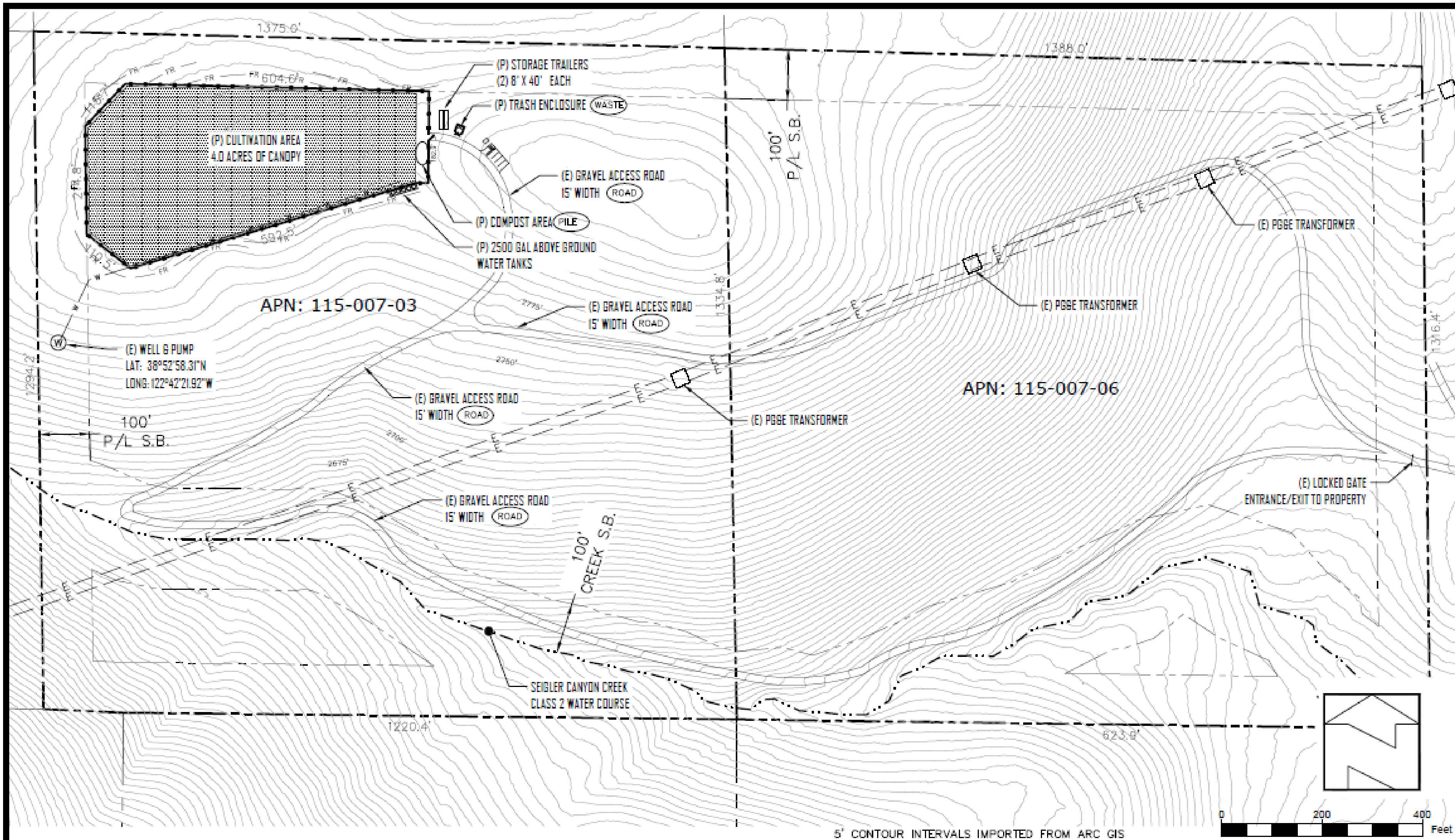


Figure 2: Proposed Project Site Map

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. el. (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; this use rate is consistent with the Estimated Water Use Section (Section 16.0) of the project's Property Management Plan. The total estimated irrigation water demand per development phase, is as follows:

- Demand for 4.0 acres of Outdoor Canopy
  - Average Daily: 12,000 gpd.
  - Annually (cultivation 180-days/year): 2,160,000 gallons, or 6.6-acre-feet per year (AFY).

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.). The monthly estimated irrigation water demand, accounting for seasonal variation, is summarized in Table 1. All landscaping aside from proposed cannabis cultivation would be drought-tolerant landscaping, which would require little- to no-water use. Accounting for higher demand during the peak part of the season, the peak daily demand is about 15,840 gallons during summer months.

Table 1: Monthly estimated water usage (units are 1,000 gallons).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Irrigation	0	0	0	86	194	313	400	454	475	238	0	0	**2,160**

WATER SOURCE AND SUPPLY

There is an existing well on APN 115-007-03 (Lat/Long: 38.88359, -122.70566, Attachment 1), drilled on January 20, 2021 by Will Peterson Well Drilling, that will be used to meet project water demand. The well was drilled to a depth of 440 ft below ground surface (BGS) into various layers of Clear Lake Volcanics. At the time of drilling, the depth to static groundwater was 360 ft BGS, and the well yield was estimated at 40 gpm via a 2-hour air-lift well yield test.

IRRIGATION METHOD AND WATER STORAGE

Irrigation water for proposed cannabis cultivation will be supplied by the existing groundwater well. Irrigation water will be pumped from the well via PVC plumbing to five (5) 2,500-gallon water storage tanks with a total storage capacity of 12,500 gallons. The storage provided represents approximately 0.8 to 1-days of the water demand, depending on the cultivation month. Water from the storage tanks will be plumbed to drip irrigation systems in individual gardens. 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.

The rate of pumping from the well will be limited by the type of pump installed on the well. Water will be pumped from the well to the water storage tanks with a solar powered pump. Solar deep well pumps powered by small solar power systems can pump a maximum rate of about 8 gpm. At this rate, it would take just over a day to fill up the 12,500 gallons of water storage.

GROUNDWATER BASIN INFORMATION AND HYDROGEOLOGY

The project is located on Seigler Mountain, situated between the towns of Kelseyville, Lower Lake, and Middletown in Lake County, CA (Figure 1). The project is located within the headwaters of the Seigler Springs Creek watershed. Seigler Springs Creek flows about 7.4 miles east and northeast and eventually into Cache Creek, which is a tributary to Clear Lake.

Seigler Mountain has an elevation of approximately 3,680 ft, is located within the Mayacamas Mountains of the Northern California Coast Range and corresponds to regional volcanism in the Clear Lake area. Water-bearing units at the project property correspond with Quaternary Volcanic aquifers. The Project parcel area was mapped by Hearn et al. (1995) as geologic unit '*asf*', described as "*flows of ilmenite-bearing andesite…with a maximum thickness of 250 m*" (Figure 3), suggesting a relatively deep depositional layer of andesitic volcanics. Underlying the *asf* unit is the mapped *rbp* unit, described as '*Pyroclastic deposits – White pumiceous tuff, lapilli tuff, and locally, coarse, pyroclastic breccia…Many deposits of airfall, locally onto quiet water and, in places, reqorked by water…*', suggesting geologic heterogeneity, variable degrees of tuffaceous welding, and pockets that likely serve as distinct or interconnected groundwater aquifers (Figure 3 and Figure 4).

Clear Lake Volcanics can consist of basalt, andesite, rhyolite, and other volcanic rocks in complex sequence. Groundwater aquifers associated with Clear Lake Volcanics occur primarily in fractures, joints, and within interlayer weathering zones between eruption events (CDM, 2006). Groundwater production rates in Clear Lake Volcanic aquifers vary according to factors such as the density, size, and interconnectedness of fractures and joints in the locale of a well. In Tuffaceous volcanic deposits, aquifer productivity can vary with the degree of welding that occurred at the time of deposition (Christensen, 2003). According to the Lake County California Statewide Groundwater Elevation Monitoring System (CASGEM), dated March 2012, 64,701 acres (7.6%) of Lake County land area is comprised of Clear Lake Volcanic geology. From these areas, an estimated 8.1% of Lake County groundwater demand is supplied from volcanic aquifers. Basement rock underlying Clear Lake Volcanic units is generally comprised of marine sedimentary or metasedimentary origin (e.g., Franciscan Formation). In the project area, basement rock unit is mapped as '*Jsp'* – interpreted as Jurassic-aged (or older) Serpentinized mafic and ultramafic rocks, some of which have locally intruded along major fault zones (Figure 4).

A review of Well Completion Report (WCR) Geologic Logs and Well test metrics from the Statewide Well Completion Report Map Application (Well Completion Report Map Application (arcgis.com)) revealed four Public Land Survey System (PLSS) sections with substantial overlap with the mapped *asf* geologic unit: PLSS Sections M12N08W13, -14, and -23, and -24. Most wells, including multiple high yielding wells with yields in excess of 100 gpm, were drilled in the vicinity and into volcanic aquifers similar to that of the project well. According to the Well Completion Report Section statistics, there are a total of 47 wells in the four PLSS Sections; however, these Sections -23 and – 24 extend beyond the mapped *asf* geologic unit. According to Section statistics for wells drilled in the four sections that overlap with the mapped *asf* geologic unit, the average and maximum well depths are 314 ft BGS and 760 ft BGS, respectively (Attachment 4).

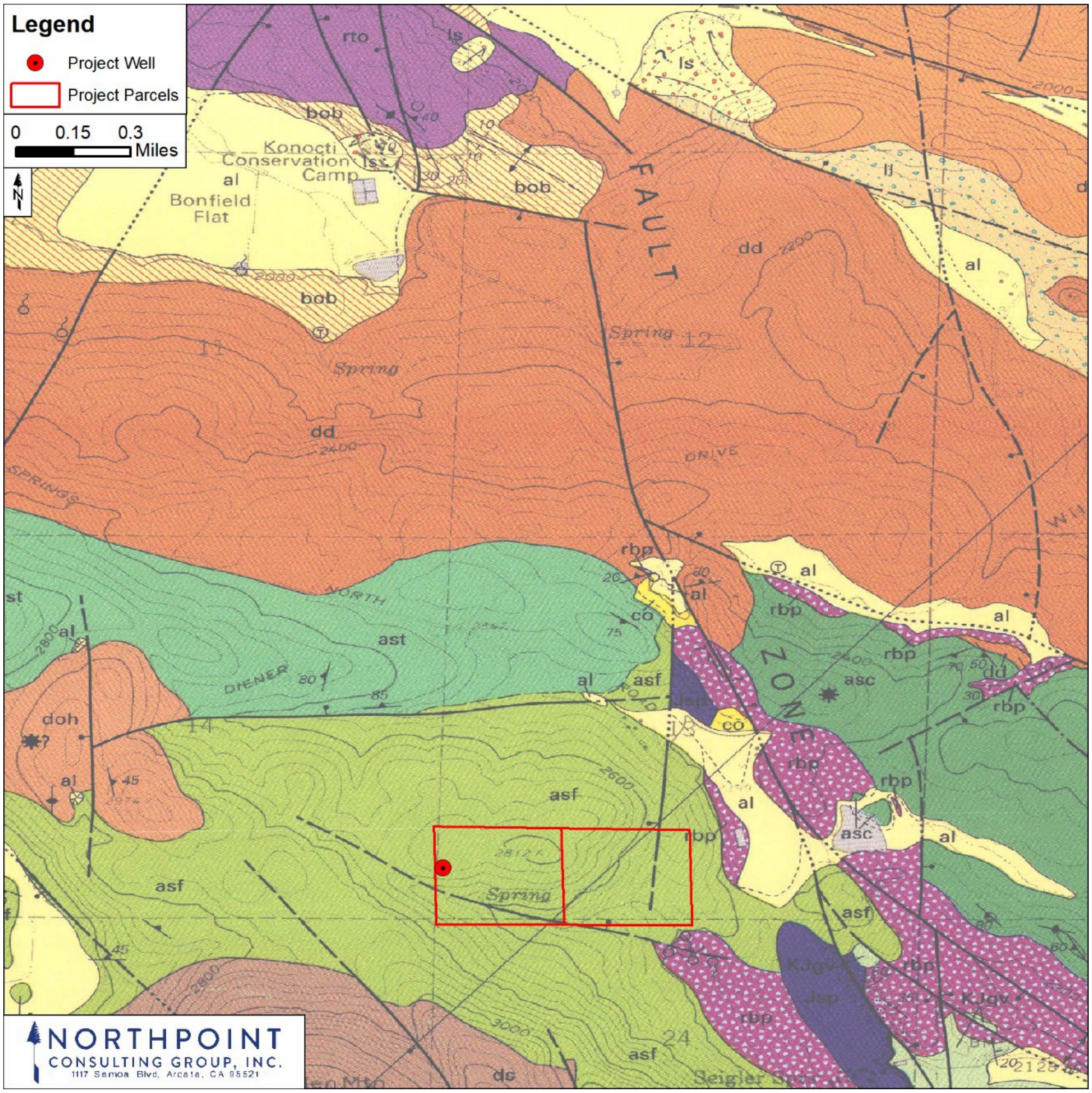


Figure 3: USGS 7.5-Minute Geologic Map of the Lower Lake area (Hearn et al., 1995) with the project parcels and well locations. The geologic units on which the parcels are mapped as 'asf' interpreted as 'flows of ilmenite-bearing andesite…with a maximum thickness of 250 m'.

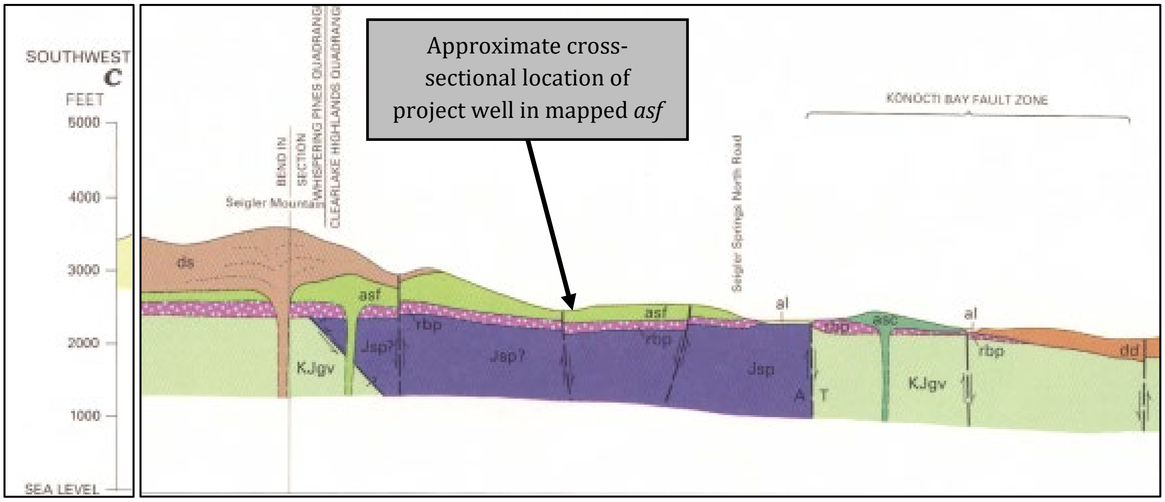


Figure 4: Approximate cross-sectional location of Project Well along Hearn et al. (1995) Cross Section C-C'

According to Hearn et al. (1995), the mapped extent of the water-bearing *asf* unit is approximately 670 acres. The aquifer storage capacity of the *asf* and underlying *rbp* volcanic geologic units can be estimated by multiplying the volume of the aquifer by the specific yield of the volcanic aquifer. The aquifer thickness is estimated as the difference between the average depth of wells from reviewed WCRs (within the *asf* unit) and the average depth to static groundwater table (Attachment 4). A specific yield value of 7% for volcanic aquifers was used, based on similar calculations for the estimation of groundwater storage in nearby volcanic aquifers (CDWR, 2003; EBA, 2016). The estimated storage capacity of the *asf* geologic unit is approximately 5,250 AF and was determined as follows:

Volcanic Aquifer of Geologic Unit 'asf'

• Aquifer Area (Hearn et al, 1995):	670 acres
• Average Depth of Wells:	314 ft BGS
• Average Depth to Static Water Level:	202 ft BGS
• Average Aquifer Thickness:	112 ft
• Specific Yield:	7%
• Estimated Groundwater Storage:	5,250 AF

The project is not located within a delineated California Bulletin 118 groundwater basin. The nearest mapped groundwater basins are Lower Lake Basin (#5-30) and the Big Valley Basin (#5-15), located approximately 3.7 miles northeast and 5.4 miles northwest, respectively. The groundwater storage in these two basins is largely derived from unconsolidated Quaternary alluvium - water-bearing units distinct from the depositional volcanic and Quaternary Volcanic geologic units mapped in the region of the project property.

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 with 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 conditions. 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. In this analysis the recharge area over the project parcels (84.56 acres) and the recharge area draining to the project location determined using the delineation tool from USGS StreamStats (StreamStats (usgs.gov), 129.7 acres) were both assessed. To be conservative, the more conservative estimate of recharge over the parcel area was used. The entire 84.56 acres of project parcel land area is pervious as observed on aerial imagery (Figure 1, Figure 5).

Soils are classified into four HSGs ("A", "B", "C", and "D") according to the expected infiltration rate of each of the mapped soil units; where HSG "A" has the greatest infiltration rate and HSG "D" has the lowest infiltration rate. 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 project parcel recharge area of 84.56 acres is comprised of HSG "C" - indicating a moderately high runoff potential (Figure 5, Attachment 2). The land use was classified as brush, or a shrubland, in fair condition. The CN for the recharge area is 70.

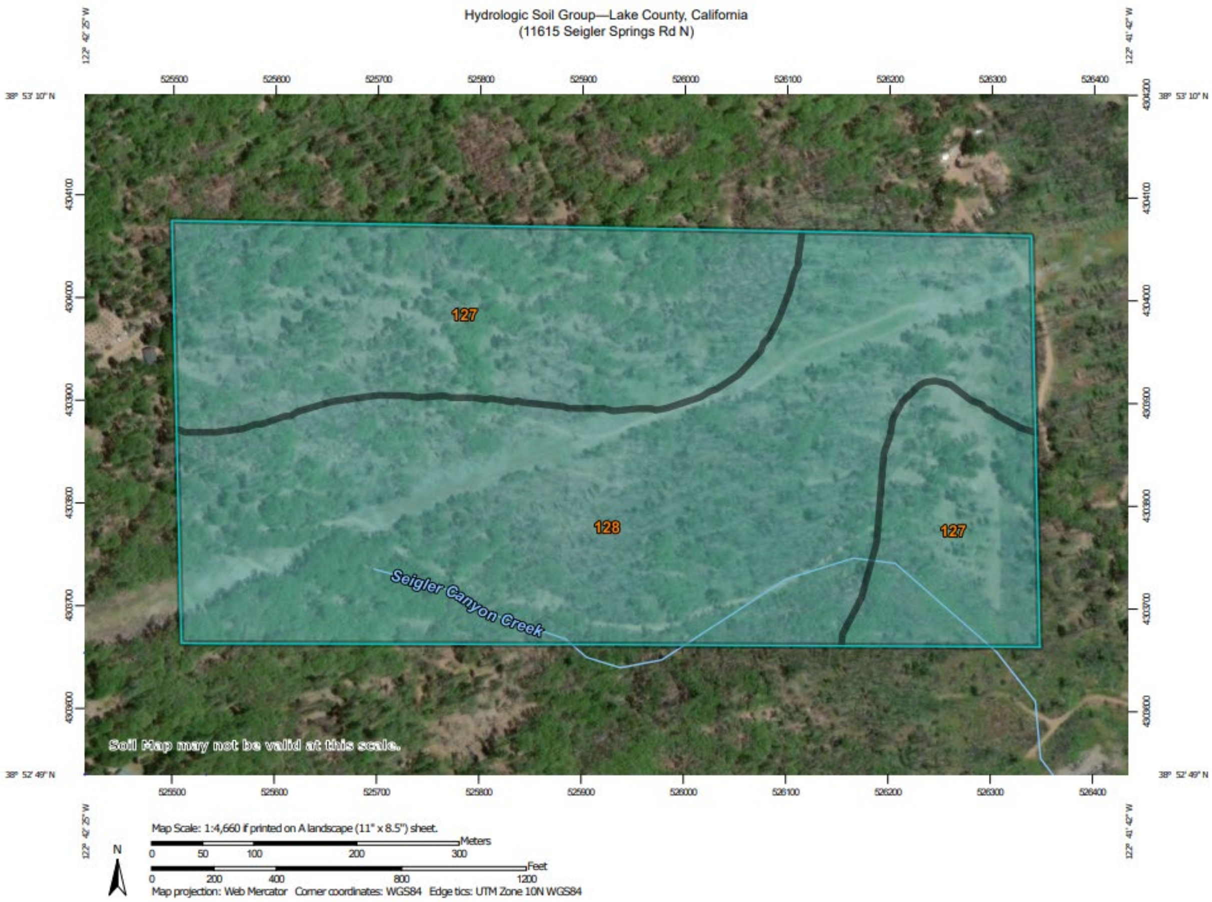


Figure 5: The 84.56-acre project parcel and recharge area (APNs: 115-007-03 and 115-007-06).

The PRISM Climate Group gathers climate observations from a wide range of monitoring networks and provides time series values of precipitation for individual locations (https://prism.oregonstate.edu/explorer/). Using the annual precipitation from 1895 to 2020, as predicted by PRISM, the annual average precipitation over this period is 50.3-inches and the minimum precipitation over this period is 9.1-inches.

Using the above information, and assuming that 100% of the initial abstractions result in evapotranspiration, the estimated annual recharge over the recharge area of 84.56 acres is 30.1 AFY during an average year and 22.3 AFY during a dry year (Table 2).

Table 2. 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)
84.56	9.1	70	4.3	0.86	5.4	3.2	22.3
84.56	50.3	70	4.3	0.86	45.5	4.4	30.1

CUMULATIVE IMPACT TO SURROUNDING AREAS

The annual water demand of the proposed project is estimated to be 6.6 AFY. The estimated an annual recharge over the project area is approximately 30.1 AFY and 22.3 AFY during average and dry years, respectively, indicating sufficient recharge to meet the project's water demand. Although determined for humid basins in the east, the USGS estimated long-term average recharge to be between 10 and 66 percent of precipitation (USGS Fact Sheet 2007-3007). Over the project parcel's 84.56-acre recharge area, this would equate to 6.4 – 42.1 AFY annual recharge during a dry year and 35.4 – 234.0 AFY annual recharge during an average year. The estimates in Table 2 fall within these ranges for a dry year and below the lower end for an average year. To be conservative, using a recharge value of 6.4 AFY to represent a drought year and 35.4 AFY to represent an average year, assuming a drought year occurs on average every 5-years, the 5-year average annual recharge would be 29.4 AFY over the 84.56-acre recharge area – which is sufficient to meet the project's demand.

According to the Lake County Water Inventory and Analysis (2006), the countywide annual groundwater demand from Clear Lake Volcanics is estimated at 3,860 AF. The proposed project represents less than 0.1% of this demand. The estimated groundwater storage in the *asf* andesitic geologic unit from which the project well sources groundwater, as mapped by Hearn et al. (1995), as 5,250 AF. These estimates are supported by numerous high-yielding wells drilled into similar Clear Lake Volcanics in PLSS Sections M12N08W-13, -14, and -23, and -24. The average well yield reported in well WCRs in the four sections is 53 gpm.

Assessment of potential impacts to nearby domestic water wells was conducted by review of adjacent parcel development or buildings that are likely to be served by a well, and location and review of available WCRs. The parameters noted from the WCRs associated with the nearest wells, as observed using the most recent Google Earth aerial imagery are summarized in Table 3. Although there is not a WCR associated with APN 115-007-05, it was assumed there is a well over 2,500 ft east of the project well.

Table 3: Nearby APNs with buildings likely served by domestic wells.

Assessor Parcel Number (APN)	Distance to Nearest Likely Well (ft)	PLSS Section/# Domestic Wells in PLSS Section	Date Drilled	PLSS Section Average Domestic Well Depth (ft)	Depth to Water Table (ft bgs)	WCR Geologic Log Water-Bearing Rock Unit	Estimated Well Discharge (gal/min)
Project Well, 115-007-03	0	M12N08W13/ 14	2/1/2022	253	360	Black Volcanic Rock	40
115-005-02	320 ft NW	M12N08W14/ 14	12/1/1987	297	350	Lava Rock	10
115-007-01	1,200 ft N	M12N08W13/ 14	5/11/2007	253	325	Broken Black Volcanic Rock	40
114-031-08	1,200 ft S	M12N08W24/ 18	8/29/1991	346	550	Very hard gray rock with green volcanic traces	120
115-007-05	2,530 ft E	M12N08W13/ 14	NA	253	NA	NA	NA

The well nearest to the project well is on APN 115-005-02, the located approximately 320 ft northwest of the project well. WCRs for numerous nearby wells drilled into similar volcanic rock units have been shown to be highly productive. Due to the distance from the nearest well, recharge estimates which substantially exceed the water use for the proposed project, the high productivity of groundwater wells drilled in local volcanic rock units, and the maximum pumping rate of 8.0 gpm, the proposed project is unlikely to have a significant cumulative impact on surrounding wells.

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 Management section of the project's Property Management Plan. The Water Use Management Plan should include 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:

<u>Seasonal Static Water Level Monitoring:</u> 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.

<u>Water Level Monitoring During Extraction:</u> 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 as determined through seasonal and operational groundwater monitoring;
- Early crop harvest, if water becomes limited;
- Install additional storage and/or implement a rainwater catchment system; 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, there is sufficient groundwater storage in the Clear Lake Volcanics, the project is situated in an area of low population and well densities, and with the implementation of water monitoring, reporting, conservation measures, and drought management the proposed project water use would not have a cumulative impact on the surrounding area.

Qualifications of Authors

Dr. Dodd has a PhD in Water Resources Engineering. In addition, Dr. Dodd is 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.

Mr. Wunderlich has a MS in Environmental Systems – Geology, and a BS in Ecology and Evolutionary Biology – Plant Sciences. Mr. Wunderlich has more than 5 years of experience conducting data-driven empirical and modeling assessments of hydrogeologic systems.

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. Well Information
2. NRCS Soil Survey Results
3. PRISM Climate Precipitation 1895 to 2020
4. Well Completion Report Summary for PLSS Sections

REFERENCES

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:
Well Information

*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

State of California

Well Completion Report

Refer to Instruction Pamphlet

No. XXXXXXX

Owner's Well Number 1

Date Work Began 1-20-21 Date Work Ended 2-1-22

Local Permit Agency LAKE County Environmental Health

Permit Number WE-5743 Permit Date 10-9-21

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	Red & Tan Clay
20	60	Volcanic Ash & Red Volcanic Rock
60	240	Volcanic Ash & Black Volcanic Rock
240	440	Black Volcanic Rock

Total Depth of Boring 440' Feet

Total Depth of Completed Well 440' Feet

Well Owner

Name Seigler Springs Holding LLC

Mailing Address 637 Lindaro St. STE 204

City San Rafael State CA Zip 94901

Well Location

Address 11615 Seigler Springs N. Rd

City Kelseyville County Lake

Latitude 115 007 03 (Deg. Min. Sec.) N Longitude ___ W

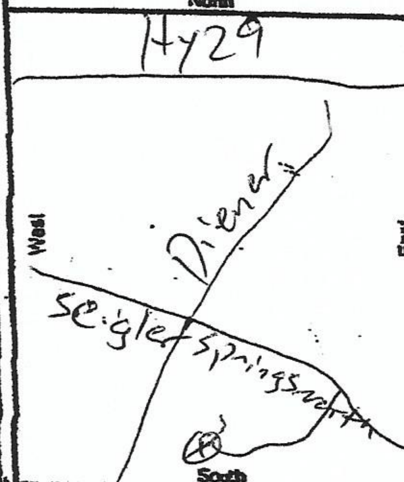
Datum ___ Dec. Lat. ___ Dec. Long. ___

APN Book 115 Page 007 Parcel 03

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 380 (Feet below surface)

Depth to Static Water Level 360 (Feet) Date Measured 1-31-22

Estimated Yield* 40 (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	380	9"	F480	PVC	1/4	4.5	Blank	
380	440	9"	F480	PVC	1/4	4.5	Perf	.032

Annular Material

Depth from Surface Feet	to Feet	Fill	Description
0	1	Seal	Concrete
1	20	Seal	Bentonite
20	440	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 Will Peterson Well Drilling (Person, Firm or Corporation)

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

Signed [signature] C-57 Licensed Water Well Contractor

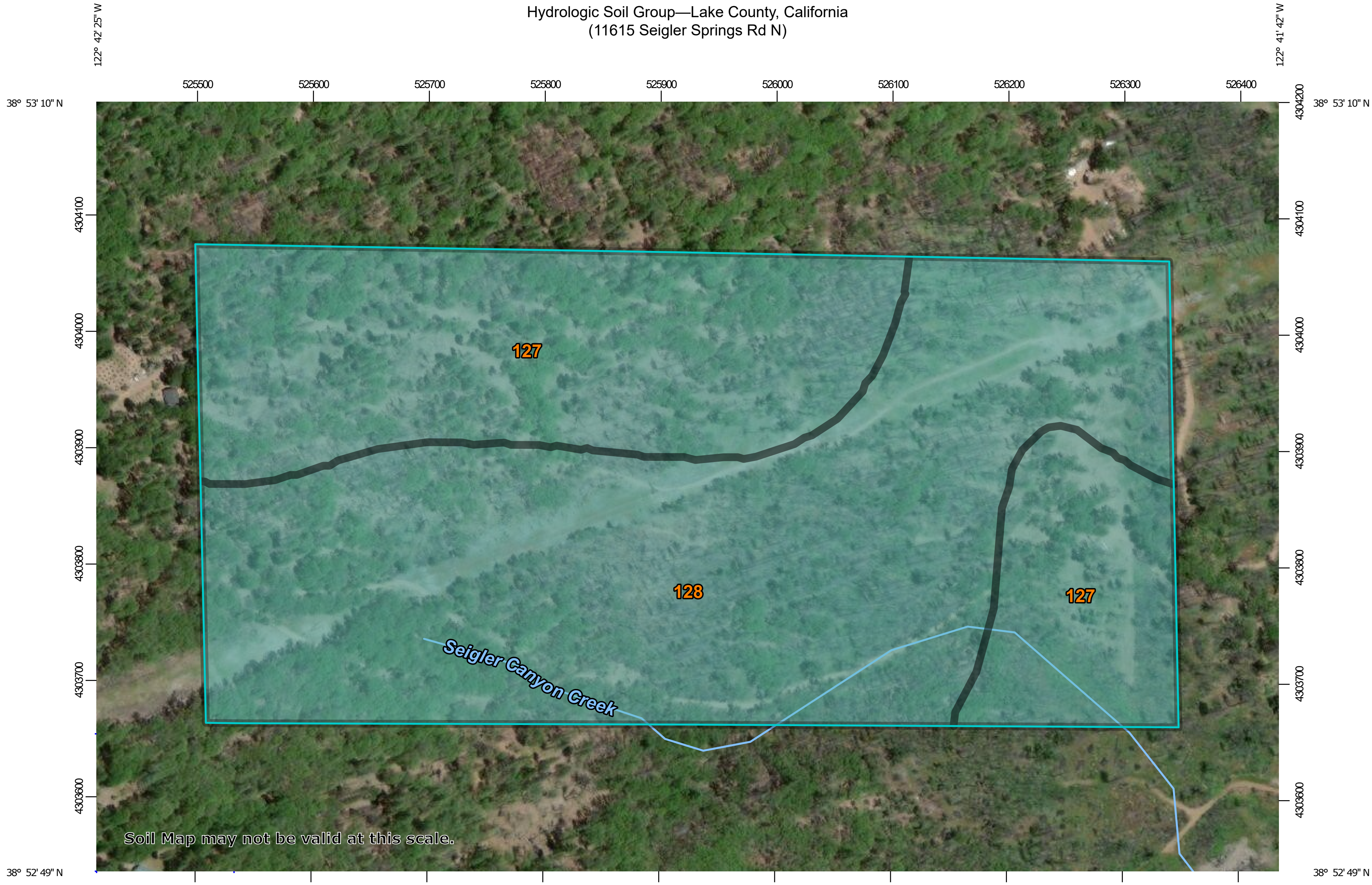
Date Signed 2-1-22 C-57 License Number 1009053

DWR 188 REV 1/2006

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Attachment 2:
NRCS Soil Survey Results

Hydrologic Soil Group—Lake County, California
(11615 Seigler Springs Rd N)



Map Scale: 1:4,660 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 50, 100, 200, 300

Feet: 0, 200, 400, 800, 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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.

> Warning: Soil Map may not be valid at this scale.
>
> Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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 18, Sep 6, 2021

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

Date(s) aerial images were photographed: Sep 18, 2016—Nov 4, 2017

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
127	Collayomi-Aiken-Whispering complex, 5 to 30 percent slopes	C	35.0	41.4%
128	Collayomi-Aiken-Whispering complex, 30 to 50 percent slopes	C	49.6	58.6%
Totals for Area of Interest			**84.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Attachment 3:
PRISM Climate Precipitation
1895 to 2020

	A	B	C	D	E	F	G
1	PRISM Time Series Data						
2	Location: Lat: 38.8833 Lon: -122.7035 Elev: 2697ft						
3	Climate variable: ppt						
4	Spatial resolution: 4km						
5	Period: 1895 - 2020						
6	Dataset: AN81m						
7	PRISM day definition: 24 hours ending at 1200 UTC on the day shown						
8	Grid Cell Interpolation: On						
9	Time series generated: 2022-Feb-03						
10	Details: http://www.prism.oregonstate.edu/documents/PRISM_datasets.pdf						
11	Date	ppt (inches)					
12	1895	63.11		**Average**	**50.3**		
13	1896	70.99		**Min**	**9.05**		
14	1897	43.9					
15	1898	31.85					
16	1899	65.54					
17	1900	43.18					
18	1901	46.11					
19	1902	74.21					
20	1903	47.21					
21	1904	84.38					
22	1905	41.73					
23	1906	69.16					
24	1907	65.04					
25	1908	35.16					
26	1909	79.96					
27	1910	31.75					
28	1911	50.48					
29	1912	40.65					
30	1913	51.91					
31	1914	58.41					
32	1915	74.86					
33	1916	50.95					
34	1917	28.66					
35	1918	36.97					
36	1919	44.18					
37	1920	55.52					
38	1921	44.2					
39	1922	44.63					
40	1923	24.57					
41	1924	36.95					
42	1925	50.63					
43	1926	59.76					
44	1927	54.91					
45	1928	39.09					
46	1929	31.36					

	A	B	C	D	E	F	G
47	1930	27.05					
48	1931	43.95					
49	1932	24.16					
50	1933	43.04					
51	1934	34.59					
52	1935	43.63					
53	1936	41.61					
54	1937	62.12					
55	1938	55.9					
56	1939	27.61					
57	1940	89					
58	1941	86.95					
59	1942	62.88					
60	1943	39.6					
61	1944	49.6					
62	1945	54.33					
63	1946	25.18					
64	1947	31.44					
65	1948	41.34					
66	1949	33.48					
67	1950	57.12					
68	1951	54.26					
69	1952	59.42					
70	1953	40.85					
71	1954	58.42					
72	1955	52.3					
73	1956	51.51					
74	1957	65.93					
75	1958	67.27					
76	1959	42.56					
77	1960	59.27					
78	1961	40.03					
79	1962	52.5					
80	1963	55.89					
81	1964	53.2					
82	1965	49.08					
83	1966	48.86					
84	1967	51.57					
85	1968	51.47					
86	1969	66.08					
87	1970	73.05					
88	1971	33.41					
89	1972	33.82					
90	1973	77.59					
91	1974	49.99					
92	1975	53.31					

	A	B	C	D	E	F	G
93	1976	19.29					
94	1977	39.13					
95	1978	52.95					
96	1979	63.61					
97	1980	50.69					
98	1981	69.69					
99	1982	75.18					
100	1983	111.46					
101	1984	35.82					
102	1985	33.78					
103	1986	58.46					
104	1987	48.61					
105	1988	32.86					
106	1989	33.07					
107	1990	29.5					
108	1991	40.98					
109	1992	52.39					
110	1993	54.9					
111	1994	36.45					
112	1995	85.52					
113	1996	76.45					
114	1997	43.88					
115	1998	75.28					
116	1999	46.43					
117	2000	47.48					
118	2001	55.68					
119	2002	49.67					
120	2003	50.89					
121	2004	45.92					
122	2005	66.37					
123	2006	54.52					
124	2007	33.36					
125	2008	38.61					
126	2009	34.56					
127	2010	69.34					
128	2011	37.31					
129	2012	58.28					
130	2013	9.05					
131	2014	51.13					
132	2015	30.5					
133	2016	61.84					
134	2017	64.54					
135	2018	38.05					
136	2019	70.41					
137	2020	15.81					

Attachment 4:
Well Completion Report
Summary for PLSS Sections

	A	B	C	D	E
1	**Section and WCR Document**	**Well Depth**	**Depth to Static Water Level**	**Geologic Material**	**Estimated Discharge (gpm)**
2	12N08W13_1089145.pdf	360	279	Variable color Volcanic Rock.	40
3	12N08W13_135270.pdf	130	20	Volcanics.	30
4	12N08W13_WCR2021-002884.pdf	505	420	Shale, serpentinite, and volcanics.	12
5	12N08W13_405494.pdf	305	88	Volcanics.	50
6	12N08W13_1093128.pdf	160	36	"Rock with Clay"	100
7	12N08W13_493677.pdf	200	NA	Serpentinite.	NA
8	12N08W13_51823.pdf	400	140	Grey rock and white chalk like rock.	NA
9	12N08W13_1093116.pdf	410	279	Volcanics.	6.5
10	12N08W13_0950538.pdf	345	189	Volcanics.	26
11	12N08W13_405501.pdf	245	100	Volcanics and Sandstone.	100
12	12N08W13_116553Y.pdf	404	180	Clay, hard grey rock, Volcanics.	19
13	12N08W13_445146.pdf	190	105	Volcanics	400
14	12N08W13_405490.pdf	140	15	Sands and clays.	100
15	12N08W14_11453.pdf	150	60	Volcanics.	29
16	12N08W14_713384.pdf	210	125	Volcanics.	150
17	12N08W14_349828.pdf	200	85	Volcanics.	12
18	12N08W14_E0274148.pdf	500	302	Volcanics.	60
19	12N08W14_245347.pdf	348	318	Volcanics.	10
20	12N08W14_406867.pdf	160	NA	NA	NA
21	12N08W14_713304.pdf	300	160	Volcanics.	275
22	12N08W14_713834.pdf	420	300	Volcanics.	50
23	12N08W14_E0242689.pdf	440	320	Volcanics.	75
24	12N08W14_756196.pdf	470	330	Volcanics.	50
25	12N08W14_210938.pdf	260	218	Volcanics.	17
26	12N08W14_713836.pdf	240	NA	NA	NA
27	12N08W14_263679.pdf	365	100	Volcanics.	10
28	12N08W14_406862.pdf	140	100	Volcanics.	20
29	12N08W14_264348.pdf	180	40	Volcanics.	2
30	12N08W24_105203.pdf	135	10	Volcanics.	30
31	12N08W23_84543.pdf	550	480	Volcanics.	15
32	12N08W23_135260.pdf	538	480	Volcanics.	37
33	12N08W23_211540.pdf	760	550	Volcanics.	120
34	12N08W23_94232.pdf	113	33	Volcanics.	60
35	12N08W23_65491.pdf	104	50	Volcanics.	80
36	12N08W23_134452.pdf	150	95	Volcanics.	10
37	12N08W23_228047.pdf	410	290	Volcanics.	50
38	12N08W23_177932.pdf	660	590	Volcanics.	15

	A	B	C	D	E
39	12N08W23_147884.pdf	120	90	Volcanics.	NA.
40	12N08W23_91756.pdf	123	19	Volcanics.	28
41	12N08W23_1093068.pdf	220	150	Volcanics.	10
42	12N08W23_134452.pdf	150	95	Volcanics.	10
43	12N08W23_302067.pdf	270	200	Volcanics.	30
44	12N08W23_705621.pdf	340	275	Volcanics.	20
45	12N08W23_84518.pdf	345	275	Volcanics.	20
46	12N08W23_236826.pdf	295	200	Volcanics.	25
47	12N08W23_302021.pdf	340	270	Volcanics.	20
48	12N08W23_211566.pdf	580	480	Volcanics.	60
49	12N08W23_367362.pdf	345	170	Clays, sands, and boulders.	7
50	**AVERAGES**	**314**	**202**		**53**