Attachment 5

REALM
Engineering
1767 Market Street, Suite C, Redding, CA 96001

HYDROLOGY REPORT

22004 MORGAN VALLEY ROAD, LOWER LAKE, CA

MARCH 24, 2022

Contents

INTRODUCTION

The purpose of this Hydrology Study/Report is to provide adequate information regarding the water usage for a proposed cannabis cultivation operation and its impacts to surrounding areas. This report was written to meet the requirements of an Urgency Ordinance requiring land use applicants to provide enhanced water analysis during a declared drought emergency, approved by the Lake County Board of Supervisors on July 27th, 2021 **(Attachment A – Urgency Ordinance No. 3106)**.

PROJECT DESCRIPTION

Blackwell Capital Management, LLC (BCM) is seeking a Major Use Permit from the County of Lake for a proposed commercial cannabis cultivation operation at 22004 Morgan Valley Road near Lower Lake, CA on Lake County APN 012-069-25 (Project Parcel/Property). The proposed cultivation operation would contain up to 51,060 ft^2 of Outdoor Cultivation/Canopy Area, two 320 ft^2 Harvest Storage Areas, and a 120 ft^2 Pesticides & Agricultural Chemical Storage Area **(Attachment B: Existing and Proposed Conditions Site Plans)**. All water for the proposed cannabis cultivation operation would come from an existing onsite groundwater well located at Latitude 38.89675° and Longitude -122.50089°.

The 37.8-acre APZ-zoned Project Parcel is located within the Soda Creek watershed (HUC12), and approximately 4.5 miles east of Lower Lake, CA. The Project Parcel is accessed via a private gravel access road off of a shared private gravel access road that connects to Morgan Valley Road approximately one-half mile southeast of the Project Parcel. Locking metal gates across the private gravel access road control access to the Project Parcel. Historical land uses of the Project Parcel include extensive agriculture (animal grazing), collective cannabis cultivation, as well as a rural residential estate. The property was severely burned in the Rocky Fire of 2015.

Topography of the Project Parcel is moderately sloped from east to west, with elevations that range from approximately 2,130 to 2,480 feet above mean sea level. An unnamed intermittent Class II watercourse and tributary of Soda Creek (NHD/DFG Water ID: 130949887) flows from north to south through the western third of the Project Parcel. Multiple ephemeral Class III watercourses form on or just east of the Project Parcel and flow west towards the unnamed intermittent Class II watercourse. No cannabis cultivation activities nor agricultural chemicals storage would occur within 100 feet of any surface waterbody.

Soils of the Project Parcel are identified as Skyhigh-Millsholm loams by the NRCS Web Soil Survey, and characterized as clay loam residuum from sedimentary rock. The United States Geological Survey Map of the Santa Rosa Quadrangle defines the area in the vicinity of the Project Parcel as the Lower Cretaceous-Upper Jurassic Great Valley Sequence, composed mostly of marine mudstones, siltstones, sandstones, and conglomerate. The Project Property is not located within any of the 13 groundwater basins/source areas identified in the 2006 Lake County Groundwater Management Plan[1].

The cultivation season for the proposed outdoor cannabis cultivation operation would begin on or after May 15th of each year (depending on climactic conditions) and end on or before November 15th of each year. The proposed outdoor cultivation/canopy areas would be enclosed with 6-foot tall galvanized woven wire fencing, covered with privacy screen/mesh where necessary to screen the cultivation/canopy area from public view. Locking metal gates would be used to control access to the proposed outdoor cultivation/canopy areas. The growing medium of the proposed outdoor cultivation/canopy areas would be an amended native soil mixture at or below grade, composed of native soil and compost. All cannabis waste generated from the proposed cultivation operation would be chipped and composted onsite. Composted cannabis waste would be stored in a designated composting area, until it is incorporated into the growing medium of the cultivation areas, as an organic soil amendment. All agricultural chemicals (fertilizers, amendments, pesticides, and petroleum products) will be stored within a proposed 120 ft^2 wooden shed (Pesticide & Agricultural Chemicals Storage Area).

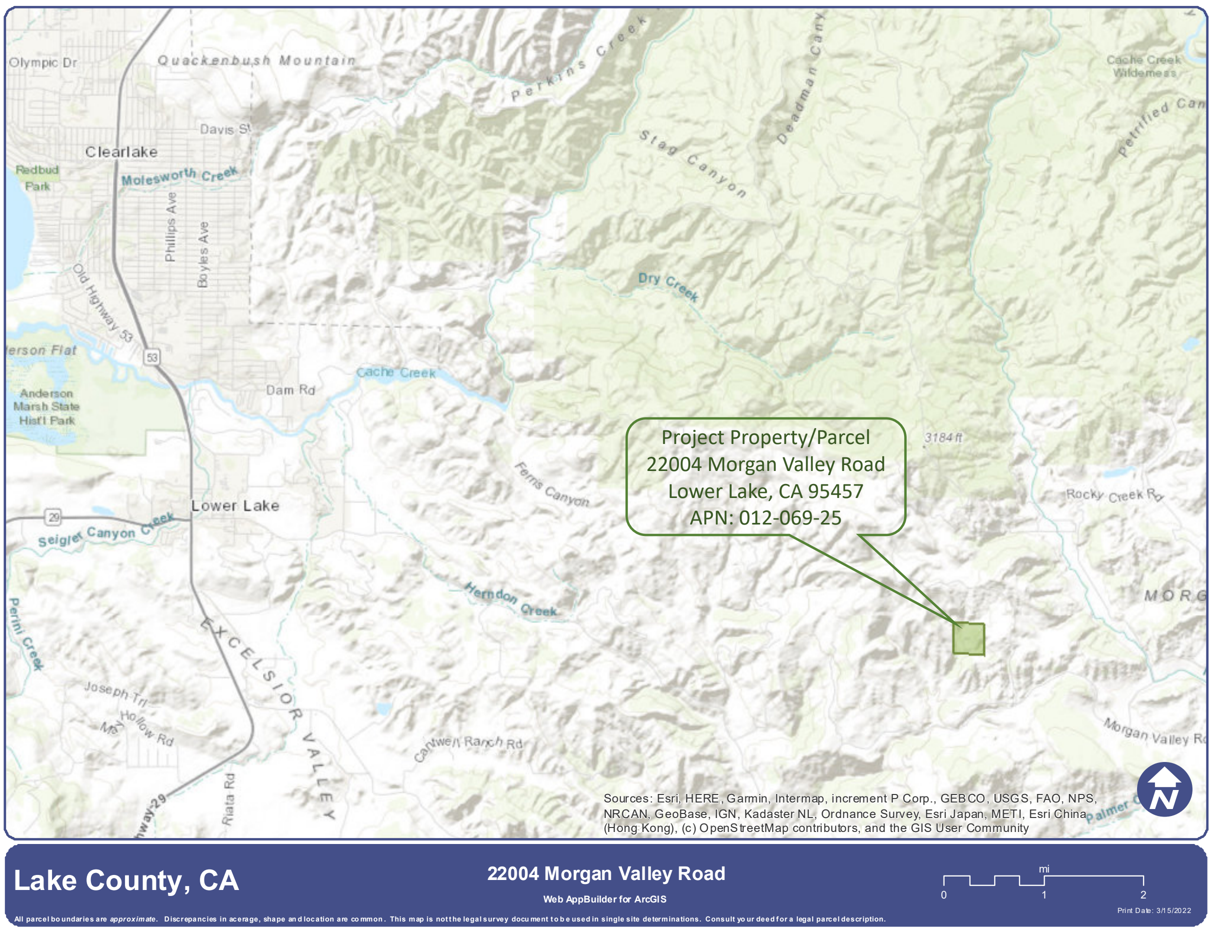

Figure 1 – Site Location Map

WATER USAGE

Cannabis has often been characterized as a high-water-use plant. Bauer et al. (2015)[2] and Carah et al (2015)[3] estimate that cannabis plants can consume up to approximately 6 gallons per plant per day, whereas grapes consume approximately 3.5 gallons per plant per day in the North Coast region of California. Other authors, however, have reported that water use requirement for cannabis plants are similar to those of other agricultural crops, such as corn and hops, with an estimated water use requirement of 25-35 inches per year (Hammon et al. 2015[4]). According to a recent study published in the Journal of Environmental Management (Dillis et al. 2020[5]), outdoor and mixed-light cannabis cultivation uses the most water during the month of August, with an estimated water use of approximately 58,704 gallons per acre during the month of August.

The total proposed outdoor cannabis cultivation/canopy area is 51,060 ft^2. According to BCM's Property Management Plan, cannabis cultivation would occur between May 15th and November 15th of each year (~180-day Cultivation Season). Based on our experience, we estimate that the annual water use requirement for the proposed cultivation operation would be approximately 2.5 acre-feet or 815,000 gallons (~2 acre-feet per acre of inground outdoor cultivation area). The following table presents the expected water use requirement of the proposed cultivation operation in gallons by month during the cultivation season (May through November).

May	June	July	August	September	October	November
33,000	98,000	163,000	196,000	163,000	130,000	32,000

Table 1 – Estimated Monthly Water Use

Based on the water use estimates above, we estimate that the proposed cultivation operation would have a maximum water use requirement of approximately 6,540 gallons per day, with an average water demand of approximately 4,530 gallons per day during the cultivation season.

WATER AVAILABILITY

All water for the proposed cultivation operation would come from the existing onsite groundwater well located at Latitude: 38.89675° and Longitude: -122.50089°. This groundwater well was drilled to a depth of 185 feet below ground surface (bgs) in December of 2020, through brown dirt, gravel, and clay (0-70 feet bgs) and shale with some sandstone (70-185 feet bgs). The onsite groundwater well was completed at a depth of 127 feet bgs. This well had an estimated yield of 18 gallons per minute (gpm) at the time it was drilled **(Attachment C: Onsite Well Completion and Performance Test Reports)**. On November 15th, 2021 JAK Drilling & Pump (License No. 1013957) conducted a 6-hour well performance test of the onsite groundwater well. During the well performance test, the water level in the onsite groundwater well was monitored while it was pumped at 10 to 11 gpm. The static water level in the onsite groundwater well was 25 feet bgs prior to the start of the well performance test. During the well performance test, the water level in the onsite groundwater well dropped to 103 feet bgs, where it stabilized for the last 4.5 hours of the 6-hour well performance test (**Attachment C: Onsite Well Completion Report and Well Test)**. The water level within the well recovered to 31 feet bgs within 40 minutes after the pumping ceased (+92% recovery). A Specific Capacity of 0.13 gpm/foot of drawdown (i.e., 10 gpm / 78 feet) was calculated from the well performance test data.

The well yield test data indicates that the onsite groundwater well can produce approximately 0.13 gpm for every foot of drawdown, and at least 10 gpm. The well recovery observations demonstrate that the well may be able to produce this water without causing overdraft conditions. The maximum estimated daily demand for water of the proposed cultivation operation is 6,540 gallons per day, which the onsite groundwater well could produce in 10 hours and 54 minutes when pumped at 10 gpm. Additionally, BCM proposes to establish 30,000 gallons of water storage capacity on the Project Property, which is over four times the peak anticipated daily water demand of the proposed cultivation operation, and could be used to reduce the amount of water that has to be pumped during the peak irrigation water use periods. Based on the estimated water usage rates, the measured pumping rates, the well recovery rate, and the proposed water storage capacity, the site appears to have the water necessary to meet the irrigation water demands of the proposed cultivation operation without creating aquifer overdraft.

AQUIFER/GROUNDWATER RECHARGE

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

To estimate the groundwater recharge at the site, we first must assume that the recharge to the aquifer is primarily through rainfall across the 37.8-acre Project Parcel. Therefore, the annual precipitation available for recharge onsite can initially be estimated using the following data and equation.

> 37.8 acres x 2.75 feet (Average Annual Precipitation for Clearlake, CA) = 104 acre-feet
> <u>Estimated Annual Precipitation Onsite = 104 acre-feet/year</u>

However, this estimate does not account for surface run-off, stream underflow, and evapotranspiration that occurs in all watersheds. According to the USGS, the long-term average precipitation that recharges groundwater in the northern California region is approximately 15 percent, but can be as low as 1.67 percent. Since the Project Parcel is mountainous, but covered in well drained clay loam soils and vegetation, we estimate that the long-term average precipitation that recharges groundwater within the entire site to be approximately 10%. With this data and the precipitation data presented above, we can estimate the groundwater recharge of the Project Parcel by using the following equation.

> 104 acre-feet/year (annual precipitation onsite) x 0.1 (long term average recharge) =
> <u>Estimated Groundwater Recharge = 10.4 acre-feet/year</u>

Based on the estimated average annual recharge to the aquifer(s) of the Project Parcel (10.4 acre-feet/year) and the estimated annual water usage of the proposed cannabis cultivation operation (2.5 acre-feet), it appears that proposed cultivation operation would have enough water to meet its demands without causing overdraft conditions.

However, the estimates above do not account for severe drought conditions, as we have seen over the last decade. The California Department of Water Resources ranked Water Year 2021 (October 1st, 2020 through September 30th, 2021) as the State's fourth driest on record. During Water Year 2021, less than 10 inches (approximately 9.5 inches) of precipitation fell on the USGS Cache Creek Precipitation Gage near Lower Lake, CA (closest USGS Precipitation Gage to the Project Property). If we rerun the calculations above using this precipitation data, we can obtain the following estimate for groundwater recharge during Water Year 2021.

> 37.8 acres x 0.8 feet (Water Year 2021 Precipitation for Lower Lake, CA) = 30 acre-feet
> 30 acre-feet (Water Year 2021 Onsite Precip) x 0.10 (long term average recharge) =
> Estimated Severe Drought Value for Groundwater Recharge = 3 acre-feet

The estimated amount of water available to recharge the aquifer under the Project Parcel during a severe drought year (~3 acre-feet) is still greater than the estimated annual water usage of the proposed cultivation operation (2.5 acre-feet).

POTENTIAL IMPACTS TO STREAMS & NEIGHBORING WELLS

Urgency Ordinance 3106 requires analysis of the "Cumulative impact of water use to surrounding areas due to project" implementation. To do this, we must first identify surrounding areas and uses that could be impacted from the project's well pumping/water usage. As outlined in previous sections of this report, all water for the proposed cultivation operation would come from an existing onsite groundwater well located at Latitude: 38.89675° and Longitude: -122.50089°, and the proposed cultivation operation would have an annual water use requirement of approximately 2.5 acre-feet or 815,000 gallons.

To evaluate potential well pumping impacts to surrounding areas and uses, the potential lateral extent of pumping from the onsite groundwater well was estimated. Using general relationships discussed in Groundwater and Wells, Second Edition (Driscoll 1986[6]), we estimated the lateral pumping influence using information from the onsite groundwater well's Well Completion Report and the November 15th, 2021 6-hour Well Performance Test **(Attachment C: Onsite Well Completion and Performance Test Reports)**. An approximate relationship between specific capacity calculated from the well yield test and aquifer transmissivity was used to obtain aquifer characteristics and estimate a potential radius of pumping influence. Transmissivity was estimated for a unconfined aquifer, using the relationship of specific capacity (yield/drawdown) multiplied by the coefficient of 1,500 (unconfined aquifer). To develop the slope of the drawdown curve from the pumping well, the value of Δs (drawdown over on log graph cycle) was calculated for a distance-drawdown relationship, where $T = 528Q/\Delta s$ (Driscoll 1986, equation 9.11[6]). The analysis is shown on the attached semi-log plots (**Attachment D – Radius of Influence Analysis)**.

The specific capacity for the onsite groundwater well was calculated to be 0.13 gpm/foot drawdown (10 gpm / 78 feet drawdown) from the 6-hour Well Performance Test. Using this data and the general relationships outlined above, we calculated a zone of pumping influence extending approximately 200 feet from the onsite groundwater well, assuming an unconfined aquifer. The estimated area of influence does not extend beyond the boundaries of the Project Parcel **(Figure 2 – Area of Influence Diagram)**, therefore we do not anticipate any impacts to neighboring wells.

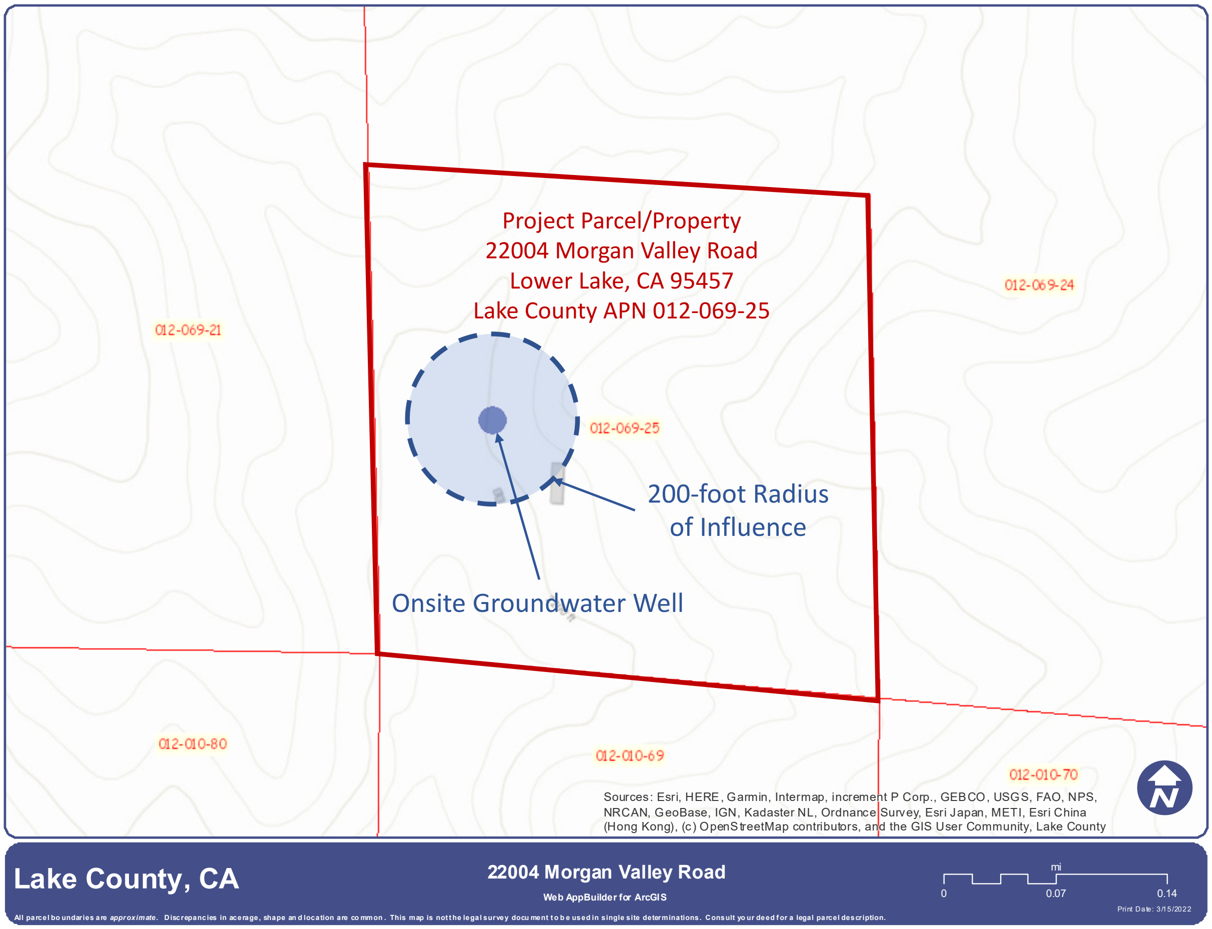

Figure 2 – Area of Influence Diagram

Multiple ephemeral watercourses form on or just east of the Project Parcel and flow west into an intermittent watercourse that flows from north to south through the western third of the Project Parcel. The intermittent watercourse passes within 200 feet of the onsite groundwater well. However the potential for stream depletion as a result of pumping the onsite groundwater well for the proposed cultivation operation is not considered a concern to this assessment, as intermittent watercourses in this region are typically dry by May of each year when pumping for the proposed cultivation operation would begin. Therefore, we do not anticipate any significant impacts to surface water bodies as a result of pumping of the onsite groundwater well for the proposed cultivation operation.

DROUGHT MANAGEMENT PLAN

The Urgency Ordinance approved by the Lake County Board of Supervisors on July 27th, 2021 requires applicants to provide a plan depicting how the applicants will reduce water use during a declared drought emergency **(Attachment A – Urgency Ordinance No. 3106)**. The proposed cultivation operation would have up to 51,060 ft^2 of outdoor cultivation/canopy area, with an estimated water use requirement of approximately 2.5 acre-feet or 815,000 gallons per year/cultivation season. All water for the proposed cultivation operation would come from the existing onsite groundwater well located at Latitude: 38.89675° and Longitude: -122.50089°, and BCM proposes to establish 30,000 gallons of water storage capacity on the Project Parcel.

Per the Water Conservation and Use requirements outlined in the State Water Resources Control Board's Cannabis General Order, BCM 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. Well water level monitoring and reporting shall be performed as follows:

Seasonal Static Water Level Monitoring
Seasonal monitoring of well water levels provides information regarding long-term groundwater elevation trends. The water level in the onsite groundwater well shall be measured and recorded prior to the start of the cultivation season (March/April), and once in the fall (November) after the cultivation season has ended. Data reported to the Lake County Community Development Department as part of the Project's annual reporting requirements shall include a hydrograph plot of all seasonal water level measurements for the onsite groundwater well.

Water Level Monitoring During Extraction
The purpose of monitoring the water level in a well during extraction is to evaluate the performance of the well to determine the effect of the pumping rate on the water source during each cultivation season. This information can be used to determine the capacity and yield of the onsite groundwater well for 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 the well water level. Data reported to the Lake County Community Development Department as part of the

Project's annual reporting requirements shall include a hydrograph plot of the water level readings during the cultivation season.

In addition to the monitoring and reporting described above, the Project's annual report shall include an analysis of the water level monitoring data, demonstrating whether or not use of the onsite groundwater 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 shall be prepared and submitted to the Lake County Community Development Department, for review and approval, demonstrating how the project will mitigate the impacts in the future.

DROUGHT EMERGENCY RESPONSE

When a drought emergency has been declared for the area of the proposed cultivation operation, BCM may implement the following additional measures, as needed or appropriate to the site, to reduce water use and ensure both success of the cultivation operation and decreased impacts to surrounding areas:

- 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 mulch 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 stress and water needs;
- Add a soil amendments/ingredients to growing medium that retains water in a way to conserve water and aid plant growth/health. Soil amendments/ingredients such as peat moss, coco coir, compost, perlite, and vermiculite retain water and provide a good environment for cannabis to grow.

Additionally, to ensure both success and decreased impacts to the surrounding areas, BCM plans to reduce their outdoor cultivation/canopy area and water usage by 10 percent or more, when a drought emergency has been declared for their region. To reduce their water usage by 10 percent or more, BCM will not plant at least 5,106 ft^2 of their proposed cultivation/canopy area. The cultivation/canopy area(s) to be left fallow will depend on when a drought emergency is declared (before or after the proposed cultivation/canopy areas have been planted), and BCM will prioritize the preferred cultivation/canopy areas over less desirable cultivation/canopy areas (based on cultivation experience). By implementing the Drought Management Plan outlined above, BCM would reduce the estimated annual water demand for the proposed cultivation operation from approximately 815,000 gallons to 733,500 gallons or less during periods of drought.

CONCLUSIONS

All water for the proposed cultivation operation would come from the existing onsite groundwater well located at Latitude: 38.89675° and Longitude: -122.50089°, and the proposed cultivation operation includes 30,000 gallons of water storage capacity. The proposed cultivation operation would have up to 51,060 ft^2 of outdoor cultivation/canopy area, with an estimated water use requirement of approximately 2.5 acre-feet or 815,000 gallons per year/cultivation season. The proposed cultivation operation would have a maximum estimated water use requirement of approximately 6,540 gallons per day, with an average water demand of approximately 4,530 gallons per day during the cultivation season (May through November).

Based on the results from a 6-hour Well Performance Test conducted on November 15th, 2021, it appears that the existing onsite groundwater well can produce at least 10 gallons per minute without overdrawing the well. Using data from the 6-hour Well Performance Test we can calculate a Specific Capacity of 0.13 gpm/foot of drawdown. Based on the estimated average annual recharge to the aquifer(s) of/under the Project Parcel (~10.4 acre-feet/year) and the estimated annual water usage of the proposed cannabis cultivation operation (~2.5 acre-feet/year), it appears that the aquifer storage and recharge area are sufficient to provide for sustainable annual water use at the site and on the Project Parcel.

The calculated zone of pumping influence for the proposed cultivation operation extends approximately 200 feet from the onsite groundwater well. An intermittent watercourse passes within 200 feet of the onsite groundwater well. Intermittent watercourses in this region are typically dry by May of each year when pumping for the proposed cultivation operation would begin. Therefore, we do not anticipate any significant impacts to surface water bodies as a result of pumping of the onsite groundwater well for the proposed cultivation operation. There are no neighboring wells within 200 feet of the onsite groundwater well. Therefore, we do not anticipate any impacts to neighboring wells as a result of pumping of the onsite groundwater well for the proposed cultivation operation

LIMITATIONS

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

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

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

This report is for the exclusive use of Blackwell Capital Management, LLC, their affiliates, designates and assignees, and no other party shall have any right to rely on any service provided by Realm Engineering without prior written consent.

Please feel free to contact me with any questions that you may have regarding this Hydrology Study/Report.

Sincerely,
Jason Vine, P.E. 67800

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530-526-7493
info@realm-engineering.com

REFERENCES

[1]Lake County Watershed Protection District, Lake County Groundwater Management Plan, 2006

[2]Bauer, S., Olson, J., Cockrill, A., et al. 2015. Impacts of surface water diversions for marijuana cultivation on aquatic habitat in four northwestern California watersheds. PLOS ONE, 10(9): e0137935

[3]Carah, J.K., Howard, J.K., Thompson, S.E., *et al.* 2015. High time for conservation: adding the environment to the debate on marijuana liberalization. Bioscience, 65, pp.822-829

[4]Hammon, B., Rizza, J. and Dean, D. 2015. Current impacts of outdoor growth of cannabis in Colorado. Colorado State University Extension, Fact Sheet No. 0.308

[5]Dillis, C.R., Grantham, T.E., Mcintee, C., McFadin, B., Grady, K.V. 2020. Water storage and irrigation practices for cannabis drive seasonal patterns of water extraction and use in Northern California. Journal of Environmental Management, Volume 272, 15 October 2020, 110955

[6]Driscoll, Fletcher G., 1986, Groundwater and Wells, Second Edition, Johnson Division, St. Paul Minnesota, 1089p.

ATTACHEMENT A

URGENCY ORDINANCE NO. 3106

BOARD OF SUPERVISORS, COUNTY OF LAKE, STATE OF CALIFORNIA

ORDINANCE NO. 3106

AN URGENCY ORDINANCE REQUIRING LAND USE APPLICANTS TO PROVIDE ENHANCED WATER ANALYSIS DURING A DECLARED DROUGHT EMERGENCY

WHEREAS, the Sheriff, acting as the OES Director of Lake County, declared a local emergency due to drought conditions on May 6, 2021; and

WHEREAS, the Lake County Board of Supervisors approved the ratification of the declaration of a local emergency due to drought conditions on May 11, 2021; and

WHEREAS, the Board of Supervisors wish to ensure continued access to drinking water from private wells or from water purveyors throughout the county; and

WHEREAS, the Board of Supervisors wish to ensure that all current agricultural activities and projects find success during this declared drought emergency; and

WHEREAS, the Board of Supervisors of the County of Lake finds that additional information is critical to ensuring that the Planning Commission approves projects based on evidence of water use and water impacts and the analysis of the impacts to the surrounding areas.

NOW THEREFORE, the Board of Supervisors of the County of Lake hereby ordains as follows:

Section One: Due to the exceptional drought that we are experiencing and the declaration of a drought emergency, any land use approvals are required to provide adequate information regarding water usage for the project being considered and its impacts to surrounding areas. All projects that require a CEQA analysis of water use must include these additional items:

A. Hydrology report prepared by a California licensed civil engineer, hydro-geologist, hydrologist, or geologist experienced in water resources
    a. Approximate amount of water available for the project's identified water source
    b. Approximate recharge rate for the project's identified water source
    c. Cumulative impact of water use to surrounding areas due to project
B. Drought Management Plan
    a. Provide a plan depicting how the applicants plan to reduce water use during a declared drought emergency, to ensure both success and decreased impacts to the surrounding areas

Section Two: This urgency ordinance, if approved, shall take effect on all future Planning Commission considerations until the declared drought emergency has expired or if the Board of Supervisors revokes the ordinance.

Section Three: It can be seen with certainty that there is no possibility that this urgency Ordinance may have a significant effect on the environment.

Section Four: All ordinances or parts of ordinances or resolutions or parts of resolutions in conflict herewith are hereby repealed to the extent of such conflict and no further.

Section Five: This ordinance shall go into effect immediately, and before the expiration of fifteen days after its passage, it shall be published at least once in a newspaper of general circulation printed and published in the County of Lake.

Section Six: This Ordinance is adopted as an urgency Ordinance pursuant to the provisions of Government Code sections 25123 and 25131 and shall be effective immediately upon adoption. Based on the declaration of purpose and facts constituting the urgency set forth above in Section One of this Ordinance, the Board of Supervisors finds and determines that the adoption of this Ordinance as an urgency Ordinance is necessary for the immediate preservation of the public peace, health and safety to address critical groundwater conditions in Lake County.

The Foregoing Ordinance was introduced before the Board of Supervisors on the 27th day of July, 2021, and passed by the following vote on the 27th day of July, 2021.

AYES: Supervisors Simon, Crandell, Scott, Pyska, and Sabatier

NOES: None

ABSENT OR NOT VOTING: None

COUNTY OF LAKE

Chair, Board of Supervisors

ATTEST: CAROL J. HUCHINGSON
Clerk of the Board of Supervisors

By: ______________________
Deputy

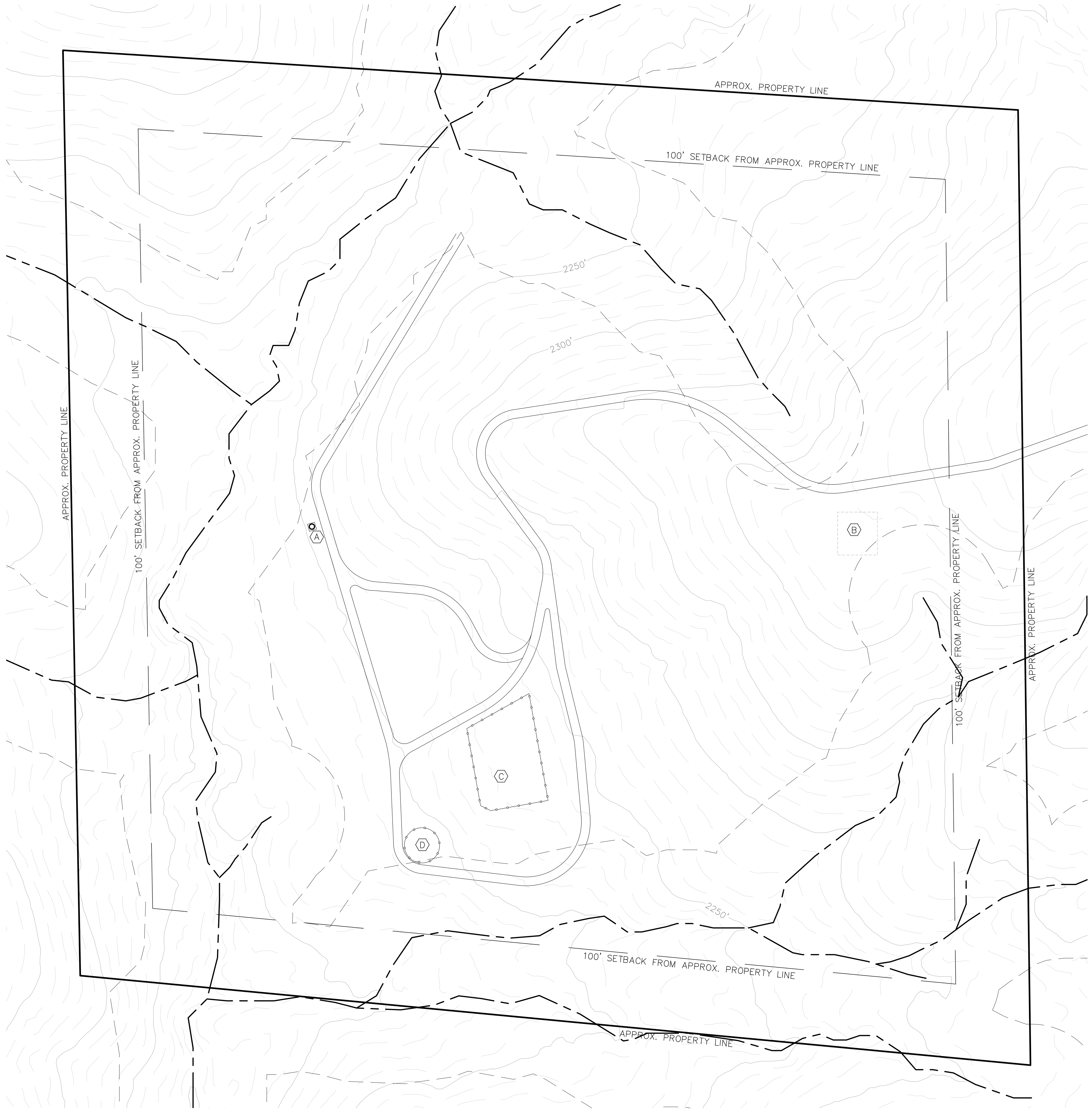
APPROVED AS TO FORM:

ANITA L. GRANT
County Counsel

By: ______________________

ATTACHEMENT B

EXISTING AND PROPOSED CONDITIONS SITE PLANS

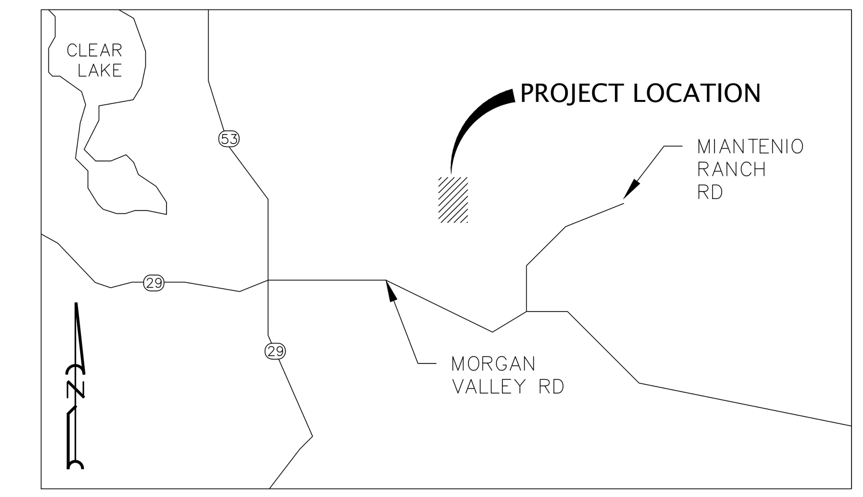


EXISTING CONDITIONS SITE PLAN

GRAPHIC SCALE

80 0 40 80

(IN FEET)
1 inch = 80 ft.



VICINITY MAP
NO SCALE

BLACKWELL CAPITAL
MANAGEMENT, LLC
22004 MORGAN VALLEY ROAD
LOWER LAKE, CA 95457 - LAKE COUNTY
APN:012-069-25

LEGEND:

1530	CONTOUR ELEVATION
	FENCE
	LIMITS OF DISTURBED AREA
	ASPHALT
	GRAVEL
	CREEK / SWALE
	(E) POWER POLE
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATELY
DWY	DRIVEWAY
(E)	EXISTING
(P)	PROPOSED
RD	ROAD
SF	SQUARE FEET

NOTES:
1. CONTOUR INTERVAL IS 10'

A GROUNDWATER WELL
LAT: 38.89675°
LONG: -122.50089°
BENEFICIAL USES: IRRIGATION & FIRE PROTECTION

B RESIDENCE (BURNED IN THE 2015 ROCKY FIRE)

C HORSE PADDOCK

D HORSE ARENA

Revisions:

REALM ENGINEERING
CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
REDDING, CA. 96001
530-526-7493

No. 67800
EXP. 06/30/21
CIVIL

EXISTING CONDITIONS SITE PLAN

22004 MORGAN VALLEY ROAD
LOWER LAKE, CA 95457
LAKE COUNTY APN#012-069-25

PLOTTED BY:

DATE PLOTTED:
8/10/21
SCALE OF DRAWING:
SEE PLAN
JOB NUMBER:

CADD FILE:

SHEET:
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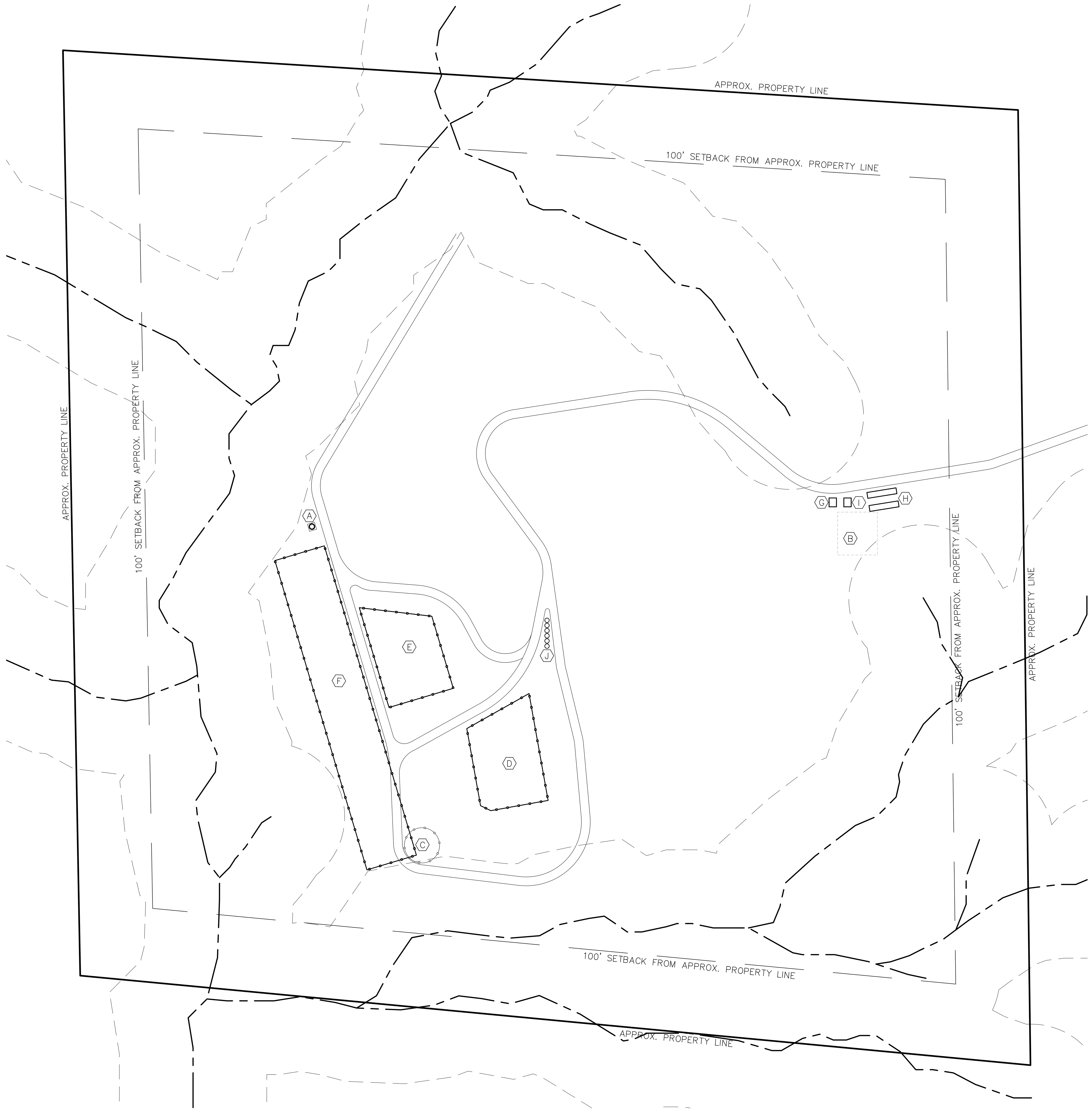
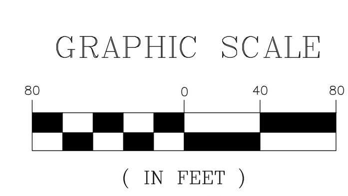
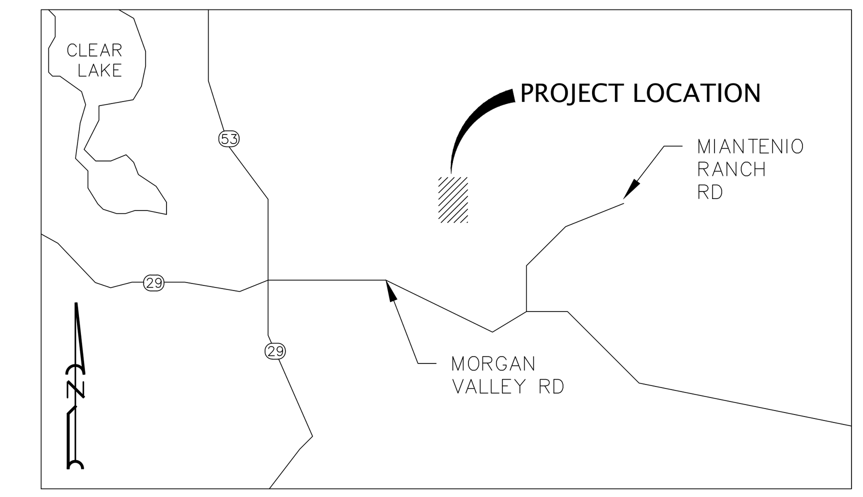


PROPOSED CONDITIONS SITE PLAN





VICINITY MAP
NO SCALE

BLACKWELL CAPITAL MANAGEMENT, LLC

22004 MORGAN VALLEY ROAD
LOWER LAKE, CA 95457 - LAKE COUNTY
APN:012-069-25

LEGEND:

- 1530 CONTOUR ELEVATION
- FENCE
- LIMITS OF DISTURBED AREA
- ASPHALT
- GRAVEL
- CREEK / SWALE
- (E) POWER POLE
- APN ASSESSOR'S PARCEL NUMBER
- APPROX APPROXIMATELY
- DWY DRIVEWAY
- (E) EXISTING
- (P) PROPOSED
- RD ROAD
- SF SQUARE FEET

NOTES:

1. CONTOUR INTERVAL IS 10'

- A GROUNDWATER WELL
  LAT: 38.89675°
  LONG: -122.50089°
  BENEFICIAL USES: IRRIGATION & FIRE PROTECTION
- B RESIDENCE (BURNED IN THE 2015 ROCKY FIRE)
- C HORSE PADDOCK
- D (P) 9,350 SF OUTDOOR CULTIVATION/CANOPY AREA
- E (P) 11,050 SF OUTDOOR CULTIVATION/CANOPY AREA
- F (P) 30,660 SF OUTDOOR CULTIVATION/CANOPY AREA
- G (P) 120 SF PEST & AG CHEMICALS STORAGE AREA (P)
- H TWO 8'x40' (320 SF) HARVEST STORAGE AREAS (P)
- I 120 SF SECURITY CENTER
- J (P) SIX 5,000-GALLON WATER STORAGE TANKS

Revisions:

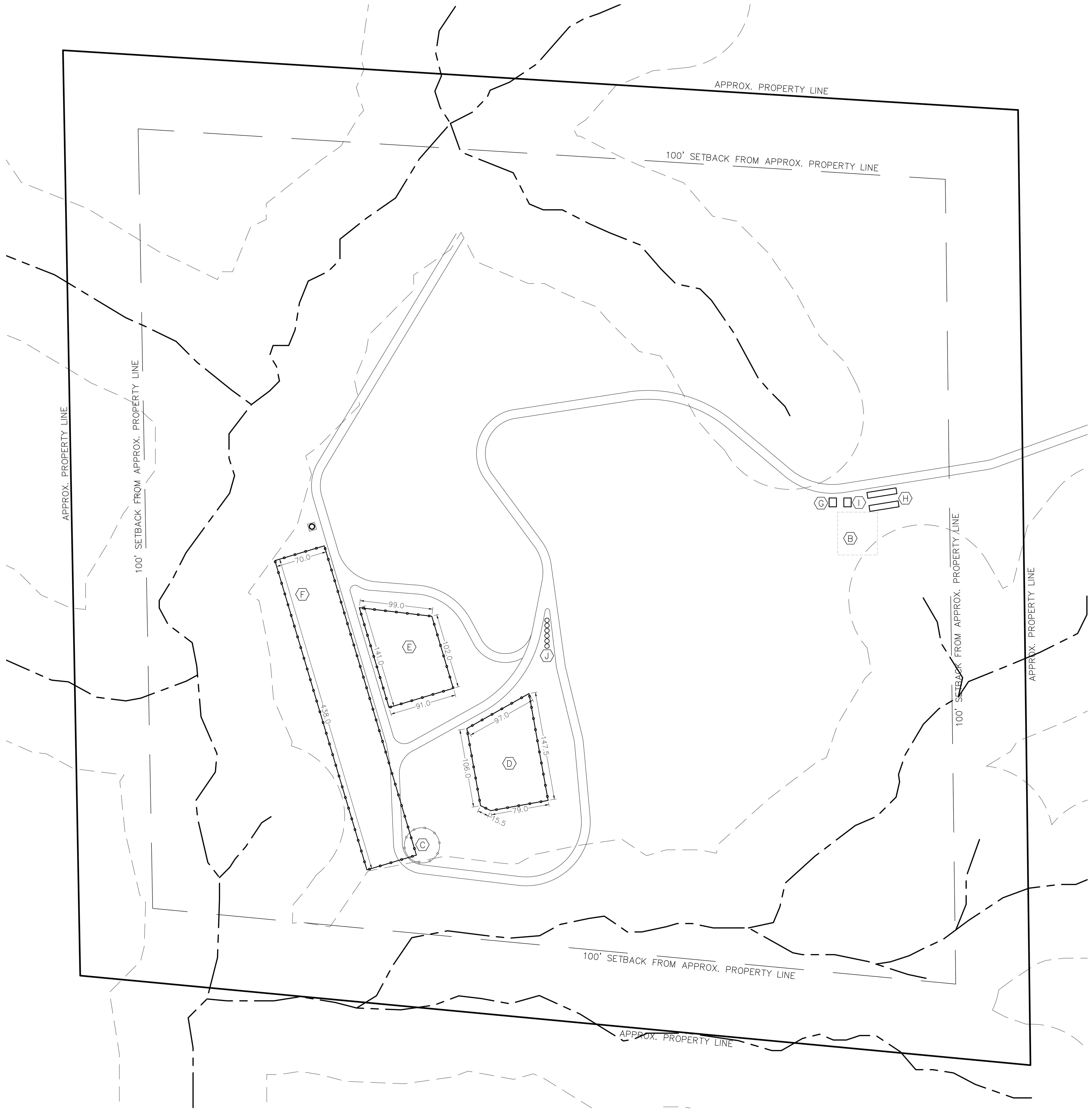
REALM ENGINEERING
CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
REDDING, CA. 96001
530-526-7493

REGISTERED PROFESSIONAL ENGINEER
JASON B. VINE
No. 67800
EXP. 06/30/21
CIVIL
STATE OF CALIFORNIA

PROPOSED CONDITIONS SITE PLAN

22004 MORGAN VALLEY ROAD
LOWER LAKE, CA 95457
LAKE COUNTY APN#012-069-25

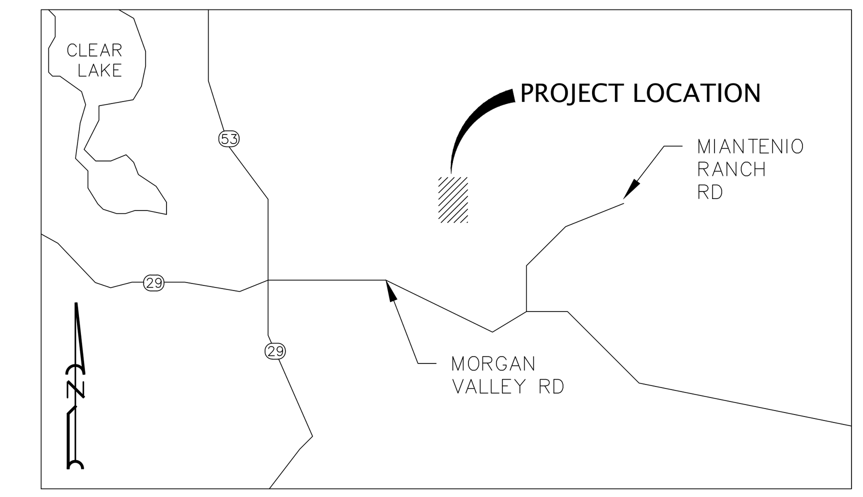
PLOTTED BY:	---
DATE PLOTTED:	8/10/21
SCALE OF DRAWING:	SEE PLAN
JOB NUMBER:	
CADD FILE:	
SHEET:	1



CULTIVATION SITE PLAN WITH CANOPY

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.



VICINITY MAP
NO SCALE

BLACKWELL CAPITAL
MANAGEMENT, LLC
22004 MORGAN VALLEY ROAD
LOWER LAKE, CA 95457 - LAKE COUNTY
APN:012-069-25

LEGEND:

- 1530 CONTOUR ELEVATION
- FENCE
- LIMITS OF DISTURBED AREA
- ASPHALT
- GRAVEL
- CREEK / SWALE
- (E) POWER POLE
- APN ASSESSOR'S PARCEL NUMBER
- APPROX APPROXIMATELY
- DWY DRIVEWAY
- (E) EXISTING
- (P) PROPOSED
- RD ROAD
- SF SQUARE FEET

NOTES:
1. CONTOUR INTERVAL IS 10'

- A GROUNDWATER WELL
  LAT: 38.89675°
  LONG: -122.50089°
  BENEFICIAL USES: IRRIGATION & FIRE PROTECTION
- B RESIDENCE (BURNED IN THE 2015 ROCKY FIRE)
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SHEET:
1

ATTACHEMENT C

ONSITE WELL COMPLETION AND PERFORMANCE TEST REPORTS

State of California

Well Completion Report

Form DWR 188 Submitted 2/9/2021

WCR2021-001805

Owner's Well Number ______ Date Work Began 12/13/2020 Date Work Ended 12/21/2020

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

Secondary Permit Agency ______ Permit Number WP0003517 Permit Date 06/10/2020

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

Name Leah Bradle

Mailing Address 1007 B College Ave #152

City Santa Rosa State CA Zip 95401

Planned Use and Activity

Activity New Well

Planned Use Water Supply Domestic

Well Location

Address 22004 Morgan Valley RD

City Lower Lake Zip 95457 County Lake

Latitude 38 Deg. 53 Min. 48.2963 Sec. N

Longitude -122 Deg. 30 Min. 3.2004 Sec. W

Dec. Lat. 38.896749 Dec. Long. -122.500889

Vertical Datum ______ Horizontal Datum WGS84

Location Accuracy Unknown Location Determination Method GPS

APN 012-069-25

Township ______

Range ______

Section ______

Baseline Meridian ______

Ground Surface Elevation ______

Elevation Accuracy ______

Elevation Determination Method ______

Borehole Information

Orientation Vertical Specify ______

Drilling Method Direct Rotary Drilling Fluid Foam

Total Depth of Boring 185 Feet

Total Depth of Completed Well 127 Feet

Water Level and Yield of Completed Well

Depth to first water 17 (Feet below surface)

Depth to Static Water Level 17 (Feet) Date Measured 12/21/2020

Estimated Yield* 18 (GPM) Test Type Air Lift

Test Length 3 (Hours) Total Drawdown ______ (feet)

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

Geologic Log - Free Form

Depth from Surface Feet to Feet		**Description**
0	30	Brown dirt and gravel
30	70	Gravel mixed with brown dirt then some clay with sandstone
70	85	shale
85	185	soft shale with some sandstone

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	30	Blank	PVC	N/A	0.375	5.563			Solid
1	30	127	Screen	PVC	N/A	0.265	5.563	Milled Slots	0.032	Screen

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
20	127	Filter Pack	Other Gravel Pack	Pea Gravel	double washed pea gravel
0	20	Bentonite	Other Bentonite		Sanitary Seal

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	30	10.875
30	185	7.875

Certification Statement

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

Name: JAK DRILLING AND PUMP, Kharom Hellwege
Person, Firm or Corporation

PO Box 250	Middletown	CA	95461
Address	City	State	Zip

Signed

electronic signature received	02/09/2021	1013957
C-57 Licensed Water Well Contractor	Date Signed	C-57 License Number

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

			N

Latitude Deg/Min/Sec

			W

Longitude Deg/Min/Sec

TRS:

APN:

Date: 11/15/2021 Technician: Jim Jackson

Client Name: Leah Bradle/Chris Macleod

Site Address: 22004 Morgan Valley Road, Lower Lake, CA

Well Pump Info (size, type, brand, etc.): Grundfos Solar

Power Source (hardwired, generator, solar only, solar with generator back up): Generator

Total Depth of Well? 127'

Diameter of Well? 5 Casing Type? PVC

Last time the water was pumped from the well? >24 hours (must rest 24-hours prior to testing)

Interval	Time	Flow Rate*	Pumping Level
Start		Static	25.0
5	12:20	11	26.0
5	12:25	11	26.5
5	12:30	11	27.5
5	12:35	11	28.0
5	12:40	11	29.5
5	12:45	11	31.0
10	12:55	11	49.0
10	13:05	11	63.0
10	13:15	10	76.0
10	13:25	10	82.0
10	13:35	10	84.0
10	13:45	10	103.0
30	14:15	10	103.0
30	14:45	10	103.0
30	15:15	10	103.0
30	15:45	10	103.0
30	16:15	10	103.0
30	16:45	10	103.0
30	17:15	10	103.0
30	17:45	10	103.0
30	18:15	10	103.0
STOP			
10	18:25	RECHARGE	77.0
30	18:55	RECHARGE	31.0

*Flow Rate Measured via Bucket or Meter

Meter Start:

Meter Stop:

Field Quality Test Completed Y

pH: 7.6

TDS: 2.22 ppm

Hardness: 37 grains per gallon

Iron: 1.0ppm

GPS: 39.896749, -122.500889

Was the pumping level measured from ground surface or top of casing?

ATTACHEMENT D

RADIUS OF INFLUENCE ANALYSIS

Radius of Influence Analysis

Well Radius (from Well Completion Report) = 5.6”/2 x 1’/12” = 0.23 feet

Specific Capacity (using data from Well Performance Test Report)
10 gpm (yield) / 78 feet (drawdown) = 0.13 gpm/foot of drawdown
Specific Capacity (SC) = 0.13

Modified Jacob’s equation from Driscoll Appendix 16-D (Driscoll 1986[6])
Transmissivity Confined Aquifer T = SC x 1500; T = 195 gpft/day

Distance Drawdown Equation Driscoll 9.11 (Driscoll 1986[6]) T=528Q/ Δs
Δs = 528Q/T; Δs = 528 x 10 gpm / 195
Δs = 27’