

Drought Management Plan

for

UP 20-92

Bar X Farms, LLC

APN's 014-250-05, 07, 10 and 14

18655, 19395, 20103, and 20333 S Hwy 29, Clearlake

Prepared for:



**Lake County Community Development
Department**

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A. Purpose

The purpose of this Drought Management Plan (DMP) is to meet the requirements of Lake County Ordinance 3106, passed by the Board of Supervisors on July 27, 2021. The Ordinance requires all projects that require a CEQA analysis of water use to provide a DMP depicting how the applicant proposes to reduce water use during a declared drought emergency to ensure both the success [of the project] and decreased impacts to surrounding areas. In addition to the DMP, Ordinance 3106 requires a Hydrology Report addressing water usage, water supply, water source recharge rate, and cumulative impacts to surrounding areas. A Hydrology Report, dated November 2021, was prepared for this project and submitted as a separate document.

Note: The project proposes water conservation measures as part of the standard operating procedures. These measures will be followed whether or not the region is in a drought emergency. These measures are included below.

B. Project Description

The project applicant for UP 20-92, Bar X Farms, LLC, proposes commercial cannabis operations in two phases. Phase 1 would consist of development of outdoor cannabis gardens for cultivation of 62.1 acres of outdoor canopy within eight (8) garden areas. Phase 2 would consist of converting one of the outdoor cultivation areas into permanent greenhouses for mixed-light cultivation, reducing the total canopy to 57.0 acres, and constructing a 60,000 sq. ft. commercial processing building. The irrigation water would be pumped from the well, via PVC piping, to approximately 27, 5,000-gallon water storage tanks (135,000 gallons of storage) located on a ridge adjacent to Southwest Garden #2, and then delivered to the individual gardens via gravity. Drip irrigation systems will be used at each garden. The drip lines will be sized to irrigate the cultivation areas at a rate slow enough to maximize absorption and prevent runoff. Drip irrigation systems, when done properly, conserve water compared to other irrigation techniques.

C. Operational Water Monitoring and Conservation Measures

As part of the project's standard operational procedures, the project proposes to implement ongoing water monitoring and conservation measures that would reduce the overall use of water. These measures have been provided in the Water Use Management Plan section (Section 16.2) of the project's Property Management Plan. The Water Use Management Plan includes information on Water Sources and Metering, Estimated Water Use, Water Conservation, and the Irrigation System. On-going water conservation measures include:

- No new 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 well 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 will be performed as follows:

Seasonal Static Water Level Monitoring: The purpose of seasonal monitoring of the water level in a well is to provide information regarding long-term groundwater elevation trends. The water level in each project well will 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, for all project wells, beginning with the initial measurement(s). Seasonal water level trends will aid in the evaluation of the recharge rate of the well. For example, if the water level in a well measured during the Spring remains relatively constant from year to year, then the water source is likely recharging each year.

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 shall be used to determine the capacity and yield of the project's wells 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 the well water level. 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, for all project wells, 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.

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 shall be prepared and submitted to the County, for review and approval, demonstrating how the project will mitigate the impacts in the future, including, for example, additional water sources and possibly a reduction in



cultivation, if a reduction in water availability has occurred.

D. 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. 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 water metering and conservation measures, during times of drought emergencies or water scarcity, the project may 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
 - Crop could be harvested early 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.

Existing conditions on Bar X Ranch (Ranch) include an existing reservoir (Lat,Long 38.777585, -122.594003) for storage of 245 acre-feet from an existing appropriative water right ([Division of Water Rights Permit for Diversion and Use of Water #20993](#)). The existing appropriative water right allows the Ranch to divert (directly from Putah Creek) and store water up to 245 acre-feet per annum to be collected from December 1 to April 15 of each year at a rate not to exceed 5 cubic feet per second (9.9 acre-feet per day). This right would continue to be used by the Ranch annually to divert and store water for the purpose of irrigation on the Ranch. The water right permit requires, for the protection of fish and wildlife, that the permittee bypass a minimum of 100 cfs in Putah Creek. The Ranch is required to maintain records of the amount of water diverted.



The diversion period is during the rainy season and would only include legally diverted water during the period of December 1 to April 15. Thus, even during a drought emergency, the water would be diverted and stored, regardless of the cannabis cultivation, per permit A030232. In the event of a drought emergency, if stored water from the existing water right is available after April 15, it could be used to offset well water. **No additional water would be diverted other than that which is legally permitted by the appropriative water right and already in storage by April 15 of each year.**

In addition to the diversion and storage of the permitted water right of 245 acre-feet, the existing reservoir receives surface runoff from approximately 325 acres. Following the same procedure in the Ordinance 3106 Hydrology Report (HSG=D, CN=77, Precipitation Dry Year = 8.2 inches, Precipitation Average Year = 39.9 inches), the total surface runoff over the 325-acre drainage area to the exiting pond, less evapotranspiration and infiltration, is approximately 131.6 acre-feet during a dry year and 973.1 acre-feet during an average year. This does not include the rainwater catchment potential provided by the surface area of the pond, which is approximately 10-acres.

Thus, there will likely be legally stored, non-diversionary water available during a drought emergency that could be used to offset well water during the emergency, if needed. No additional surface water, other than what could be legally collected and stored by the Ranch under its existing appropriative right, is proposed to be diverted for cannabis cultivation. In addition, if water is limited during a drought emergency, drought conservation measures will be implemented, including reducing the amount of cultivation and/or the length of the cultivation season.

E. Potential Rainwater Catchment

Rainwater catchment is an option if the project needs to offset the groundwater well to supply the project. The barn, greenhouses, and processing building provide a total of 816,250 sq. ft. of potential rainwater catchment area. Estimated potential rainwater catchment volume for dry and average precipitation years is summarized below. Storage could be provided using additional water storage tanks or a rainwater catchment pond, both of which would provide additional potential catchment area. The estimated demand at full buildout is approximately 94.5 acre-feet. Rain catchment from the proposed cannabis facilities could offset about 14%-66% of the project’s demand during a dry year.

Catchment	Area (sq. ft.)	Potential Rainwater Catchment Volume			
		Dry Year (8.2 inches)		Average Year (39.9 inches)	
		Acre-Feet	Gallons	Acre-Feet	Gallons
Barn	16,250	0.25	83,065	1.24	404,181
Greenhouses	740,000	11.61	3,782,644	56.49	18,405,794
Processing Building	60,000	0.94	306,701	4.58	1,492,362
Total	816,250	12.8	4,172,410	62.3	20,302,337

