MEMORANDUM

WALLACE GROUP®

CIVIL AND TRANSPORTATION ENGINEERING

CONSTRUCTION MANAGEMENT

LANDSCAPE ARCHITECTURE

MECHANICAL ENGINEERING

PLANNING

PUBLIC WORKS ADMINISTRATION

SURVEYING / GIS SOLUTIONS

WATER RESOURCES

Date: July 13, 2020

To: Kirk Azevedo
Riparian Biosupport, Inc.

From: Shannon Jessica, PE
Wallace Group

Subject: Water Use Evaluation for Proposed Cannabis Cultivation on APN: 014-331-064 (Parcel B)

Wallace Group has been retained to estimate the water demand for a proposed cannabis cultivation operation in San Luis Obispo County. The proposed cultivation, located on Parcel B of 1385 Klau Mine Road (APN: 014-331-064), includes the following:

- Outdoor/Hoop House Cultivation – 3 acres total
- Indoor Greenhouse Cultivation – 22,000 square feet canopy
- Nursery – 2,700 square feet

The Cannabis Land Use Ordinance for San Luis Obispo County requires that applicants submit a detailed water management plan as part of the application. The water management plan is to include proposed water supply, proposed conservation measures, and any water offset requirements. The following memorandum has been developed to outline the proposed water demand and associated offset required for the proposed project.

Published water use values have not yet been consistently established in the industry or in San Luis Obispo County. Research and conversations with the Central Coast Regional Water Quality Control Board (RWQCB) cannabis development team has indicated that local agencies are using an estimate of 0.03 gal/sf canopy/day for outdoor cannabis plants and an application rate of 0.1 gallons per square foot of canopy for indoor cultivation operations. These values are derived from the *Santa Cruz County Draft Environmental Impact Report (EIR) for the Commercial Cannabis Cultivation and Manufacturing Regulations and Licensing Program (August 2017)*[1]. In section 3.0, pages 3-16 and 3-17 of the EIR, it is described that the water application rates used are derived from a study in Humboldt County by Milewide Nursery[2]. The Milewide Nursery study includes a breakdown of the per yield water use. The study based their results on a 90-day cycle and estimate that two growing cycles could be completed in a year for outdoor cultivation, and an estimated 270 days growing season, or 3 cycles per year, for indoor cultivation. As defined in the San Luis Obispo

[1]Santa Cruz County Draft Environmental Impact Report (EIR) for the Commercial Cannabis Cultivation and Manufacturing Regulations and Licensing Program (August 2017) http://www.sccoplanning.com/PlanningHome/Environmental/CEQAInitialStudiesEIRs/CannabisRegulationsEnvironmentalReview/CannabisEnvironmentalImpactReport(EIR).aspx

[2] https://humboldtgrower.wordpress.com/2015/05/07/may-2015-humboldt-county-cannabis-water-use-study/

WALLACE GROUP
A California Corporation

612 CLARION CT
SAN LUIS OBISPO
CALIFORNIA 93401

T 805 544-4011
F 805 544-4294

www.wallacegroup.us

County Cannabis Ordinance, hoop houses are considered outdoor cultivation while nursery cultivation is considered indoor.

Table 1 outlines the proposed water demand for this project. The project will utilize portable restrooms for employees, therefore a domestic water demand is not added to the irrigation estimate. Table 2 outlines the proposed monthly water use, based on the total water demand for cultivation. Local evapotranspiration data was used to extrapolate the annual water demand into monthly estimates during the growing season.

Table 1: Annual Water Demand Estimate

Use	Rate	Gross Demand (gallons/ year)	Gross Demand (AFY)
Outdoor Cultivation: 130,680 sf	130,680 square feet canopy area x 0.03 gal/sf/day x 180 days	705,672	2.17
Indoor Greenhouse Cultivation: 22,000 sf	22,000 square feet canopy area x 0.1 gal/sf/day x 270 days	594,000	1.82
Indoor Nursery Cultivation: 2,700 sf	2,700 square feet canopy area x 0.1 gal/sf/day x 270 days	72,900	0.22
		Total New Water Demand	**4.21**

Table 2. Estimated Monthly Water Demand for Cannabis Cultivation

Month	ETo (in)**	Outdoor ETo During Growing Season (%)	Outdoor Cultivation Water Use/Month (AF)	Indoor Water Use/month (AF)	Total Water Use/month (AF)
October	3.50	-	-	0.17	0.17
November	2.02	-	-	0.17	0.17
December	1.51	-	-	0.17	0.17
January	1.69	-	-	0.17	0.17

February	2.24	-	-	0.17	0.17
March	3.72	-	-	0.17	0.17
April	4.76	13.5	0.29	0.17	0.46
May	6.03	17.1	0.37	0.17	0.54
June	6.56	18.6	0.40	0.17	0.57
July	6.60	18.8	0.41	0.17	0.58
August	6.30	17.9	0.39	0.17	0.56
September	4.94	14.0	0.30	0.17	0.47
Total	**49.87**	**100%**	**2.17**	**2.05**	**4.21**

**California Irrigation Management Information System (CIMIS) Weather Station #163; Atascadero (active November 2000 to March 2018)

Water Offset

The project site is not located within the Paso Robles Groundwater Basin and therefore the new water demand of 4.21 AFY is not required to be offset.

Water Supply

The proposed project will utilize an existing on-site groundwater well to supply water for crop irrigation. The well produces 21 gpm (see Attachment A for pump test and quality data). At 21 gpm, the well has 33.8 AFY capacity, therefore the well has sufficient capacity to provide the proposed project with irrigation supply.

Water saving practices will include the use of drip and micro-sprinkler irrigation emitters. Wi-Fi connected water moisture sensors will be used to determine optimal irrigation timing. Water used for cannabis irrigation will be metered and water demand will be recorded daily and monitored closely to ensure the system is operating efficiently and without leaks or line breaks.

California Department of Fish and Wildlife

Because the project will be using an existing groundwater well for water supply, the owner will not need to obtain a General Agreement or Lake or Streambed Alteration (LSA) permit through California Department of Fish and Wildlife (CDFW). However, annual licenses for cannabis cultivation issued by California Department of Food and Agriculture (CDFA) will require the owner to demonstrate by written verification from CDFW that an LSA Agreement is not required. This is accomplished by submitting a self-certification application on the CDFW webpage and obtaining written correspondence from CDFW verifying that the LSA is not required for this project.

Regional Water Quality Control Board

Some cultivation activities can generate wastewater such as hydroponic solutions, irrigation tail water, and sanitation activities, etc. Typically, wastewater will be discharged either into a community collection system or to an onsite wastewater treatment system (septic tank/leachfield). These activities will be monitored through the Regional Water Quality Control Board for on-site disposal systems.

Regardless of the process wastewater discharge strategy, the RWQCB will require that outdoor cultivation operations enroll in the General Waste Discharge Requirements for Waste Associated with Cannabis Cultivation Activities (Cannabis General Order). The Cannabis Policy and General Order apply to commercial cannabis cultivation activities and enrollment in the General Order will be required for all commercial cultivation activities. The tier determination will need to be finalized by the RWQCB once an application has been submitted and reviewed by Board staff. Tier 2 dischargers are required to submit a technical report to the RWQCB, due March 1, annually.

Coverage under the General Order is obtained by applying through the online application portal on the Regional Water Quality Control Board website. After the application is submitted and the application fee paid, the RWQCB will issue a Notice of Applicability (NOA). The NOA can be presented to the CDFA to obtain a commercial cannabis cultivation license. The application portal is located at: www.waterboards.ca.gov/cannabis.

WALLACE GROUP®

APPENDIX A – WELL PUMP TEST INFORMATION

San Luis Obispo County Farm Supply

"A Farmer Owned Cooperative"

WELL TEST REPORT

CUSTOMER: BILL DODD

DATE: JAN.11,2018

ADDRESS: 1385 KLAU MINE RD

CITY & STATE: PASO ROBLES,CA

LOCATION OF TEST : @ ABOVE ADDRESSS

TEST INFORMATION

TIME	PUMPING LEVEL	G.P.M.
9:30	46'	21
10:15	52'	21
10:30	52'	21
10:45	52'	21
11:00	52'	21
11:15	53'	21
11:30	53'	21
11:45	53'	21
12:00	53'	21
12:15	54'	21
12:30	54'	21
12:45	54'	21
1:00	54'	21
1:30	54'	21
2:00	54'	21

WELL INFORMATION

WELL SIZE: 5"

WELL DEPTH:

TEST PUMP SIZE: 3/4 H.P.

STANDING LEVEL: 46'

PUMPING SETTING :

HOURS OR RUNNING: 4 HRS.

TEST STARTED: 10:00 A.M.

SHUT DOWN: 2:00 P.M.

RECOVERY: 10' IN 9 MIN. 25 SEC.

ADDITIONAL INFORMATION

HAVE 2,500 GALLON STORAGE TANK

PUMP DEPARTMENT

224 Tank Farm Road
Post Office Box 111
San Luis Obispo, CA 93406
805 543-3751

1108 Paso Robles Street
Paso Robles, CA 93446
805 238-1177

1920 N. Broadway
Santa Maria, CA 93454
805 922-2737

1079 El Camino Real
Arroyo Grande, CA 93420
805 489-5514

Abalone Coast Analytical, Inc.
141 Suburban Rd, Ste C-1 San Luis Obispo CA, 93401
Phone: 595-1080 Fax: 595-1080

Order #: 18-0342
Date/Time Rec'd: 1/12/18 0914

Farm Supply Company
224 Tank Farm Road
San Luis Obispo, CA 93401

Contact: Ben
Phone: 543-3751
Sampler: Dan/Jason

Project: **PO #PR5160**

Sample #	Sample Description	Date / Time	Analysis	Method	Result	Units	RL	Completed
-1	1375 KlaU Mine Rd	1/12/18 0630	Total Coliform	SM 9223 B.	Absent	/100ml	1	01/13/18
			E-coli	IDEXX	Absent	/100ml	1	01/13/18
-2	1385 KlaU Mine Rd	1/12/18 0630	Total Coliform	SM 9223 B.	Absent	/100ml	1	01/13/18
			E-coli	IDEXX	Absent	/100ml	1	01/13/18

These samples pass water quality standards for Total Coliform and E. Coli Bacteria.

Report Completion Date: **1/15/18**

Reviewed By: Erika Frost
Erika Smith, Lab Director

Definitions:
Absent = Less than 1 CFU/100mLs
Present = 1 or more CFU/100mLs
CFU = Colony Forming Unit
RL = Reporting Limit

State of California CDPH ELAP 2661

ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

January 10, 2018

Riparian Biosupport, Inc.
Attn: Kirk Azevedo
4070 West St.
Cambria, CA 93428

Lab ID : CC 1785354-001
Customer ID : 8-1458

Sampled On : December 27, 2017
Sampled By : Kirk Azevedo
Received On : December 29, 2017
Matrix : Ag Water

Description : Main Home Well
Project : Ag Water Monitoring

Grape Irrigation Suitability Analysis

Test Description	Result				Graphical Results Presentation				
Cations	mg/L	Meq/L	% Meq	Lbs/AF	Good	Possible Problem	Moderate Problem	Increasing Problem	Severe Problem
Calcium	139	6.9	69	380	**				
Magnesium	34	2.8	28	92	**				
Potassium	< 1	0	0	0	**				
Sodium	8	0.35	3	22					
Anions									
Carbonate	< 10	0	0	0					
Bicarbonate	500	8.2	75	1400	**				
Sulfate	120	2.5	23	330	**				
Chloride	10	0.28	3	27					
Nitrate	< 1.8	0	0	0					
Nitrate Nitrogen	< 0.5			0					
Fluoride	0.4	0.021	0	1					
Minor Elements									
Boron	< 0.1			0.00					
Copper	< 0.01			0.00					
Iron	< 0.03			0.00					
Manganese	< 0.01			0.00					
Zinc	0.030			0.082					
TDS by Summation	811			2200					
Other									
pH	7.2			units					
E. C.	0.962			dS/m					
SAR	0.2								
Crop Suitability									
No Amendments	Good								
With Amendments	Good								
Amendments									
Gypsum Requirement	0.0			Tons/AF					
Sulfuric Acid (98%)	29			oz/1000Gal	Or 69 oz/1000Gal of urea Sulfuric Acid (15/49).				
Leaching Requirement	6.4			%					

Good Problem

Note: Color coded bar graphs have been used to provide you with 'AT-A-GLANCE' interpretations.

** Used in various calculations; mg/L = Milligrams Per Liter (ppm) meq/L = Milliequivalents Per Liter

Corporate Offices & Laboratory
853 Corporation Street
Santa Paula, CA 93060
TEL: (805)392-2000
Env FAX: (805)525-4172 / Ag FAX: (805)392-2083
CA ELAP Certification No. 1573

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209)942-0182
FAX: (209)942-0423
CA ELAP Certification No. 1563

Office & Laboratory
563 E. Lindo Avenue
Chico, CA 95926
TEL: (530)343-5818
FAX: (530)343-3807
CA ELAP Certification No. 2670

Office & Laboratory
3442 Empresa Drive, Suite D
San Luis Obispo, CA 93401
TEL: (805)783-2940
FAX: (805)783-2912
CA ELAP Certification No. 2775

Office & Laboratory
9415 W. Goshen Avenue
Visalia, CA 93291
TEL: (559)734-9473
FAX: (559)734-8435
CA ELAP Certification No. 2810

January 10, 2018

Riparian Biosupport, Inc.

Lab ID : CC 1785354-001
Customer ID : 8-1458
Description : Main Home Well

Micro Irrigation System Plugging Hazard

Test Description	Result		Graphical Results Presentation
			Slight / Moderate / Severe
Chemical			
Manganese	< 0.01	mg/L	
Iron	< 0.03	mg/L	
TDS by Summation	811	mg/L	
No Amendments			
pH	7.2	units	
Alkalinity (As CaCO3)	410	mg/L	
Total Hardness	487	mg/L	
With Amendments			
Alkalinity (As CaCO3)	82	mg/L	
Total Hardness	82	mg/L	
pH	5.4 - 6.7	units	

Good Problem

Note: Color coded bar graphs have been used to provide you with 'AT-A-GLANCE' interpretations.

Water Amendments Application Notes:

The Amendments recommended on the previous pages include:

Sulfuric Acid:

These products should be applied as needed to prevent emitter plugging in micro irrigation systems and/or as a soil amendment to adjust soil pH to improve nutrient availability and to facilitate leaching of salts. Please exercise caution when using this material as excesses may be harmful to the system and/or the plants being irrigated. The reported Acid requirement is intended to remove approximately 80 % of the alkalinity. The final pH should range from 5.4 to 6.7. We recommend a field pH determination to confirm that the pH you designate is being achieved. This application is based upon the use of a 98% Sulfuric Acid product. The application of Urea Sulfuric Acid is based upon the use of a product that contains 15% Urea (1.89 lbs Nitrogen), 49% Sulfuric Acid and has a specific gravity of 1.52 at 68 °F.

Guidelines for the above interpretations are sourced from USDA & U.C. Cooperative Extension Service publications. Please contact us if you have any questions.

FRUIT GROWERS LABORATORY, INC.

Scott Bucy

Scott Bucy, Director of Ag. Services

SB1:EHB

ENVIRONMENTAL AGRICULTURAL
Analytical Chemists

January 10, 2018

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Magnesium	34	2.8	28	92	**				
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Fluoride	0.4	0.021	0	1					
Minor Elements									
Boron	< 0.1			0.00					
Copper	< 0.01			0.00					
Iron	< 0.03			0.00					
Manganese	< 0.01			0.00					
Zinc	0.030			0.082					
TDS by Summation	811			2200					
Other									
pH	7.2			units					
E. C.	0.962			dS/m					
SAR	0.2								
Crop Suitability									
No Amendments	Fair								
With Amendments	Good								
Amendments									
Gypsum Requirement	0.0			Tons/AF					
Sulfuric Acid (98%)	29			oz/1000Gal	Or 69 oz/1000Gal of urea Sulfuric Acid (15/49).				
Leaching Requirement	7.4			%					

Good Problem

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TEL: (559)734-9473
FAX: (559)734-8435
CA ELAP Certification No. 2810

January 5, 2018

Riparian Biosupport, Inc.

Lab ID : CC 1785250-003
Customer ID : 8-1458
Description : D3 Front Yard Mobile

GRAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation
Others				Satisfactory / Possible Problem / Moderate Problem / Increasing Problem
Soil Salinity	0.57	dS/m	0.0 - 2.0	
SAR	0.3		0.0 - 6.0	
Limestone	< 0.10	%	0.0 - 0.50	
				0 / 1 / 2 / 3 / 4 / 5 / 6
Lime Requirement	0	Tons/AF	---	
Gypsum Requirement	< 0.50	Tons/AF	---	
				Very Low / Moderately Low / Optimum / Moderately High / Very High
Moisture	18.3	%	8.7 - 61	
				Loamy Sand / Sandy Loam / Loam / Silt Loam / Clay Loam / Clay / Organic
Saturation	86.9	%	40 - 50	

Good — Problem — Indicates physical conditions and/or phenological and amendment requirements.

Note: Soils with gypsum requirements over 10 tons should be applied incrementally at a maximum of 10 tons per acre per year and reanalyzed yearly after each application.

1) The need for soil Nitrate is dependent upon crop phenology (Growth Stage) and crop requirement. A soil Nitrate level of 10 - 40 ppm is preferred for a short time during critical periods of uptake into the vine. It is highly desirable to have low soil Nitrate (< 5ppm) prior to winter rainfall and cold soil conditions. Use the leaf Nitrogen level to determine primary Nitrogen requirement.

FRUIT GROWERS LABORATORY, INC.

Scott Bucy

Scott Bucy, Director of Ag. Services

SB1:EHB