



Water Resource Protection Plan (WRPP)

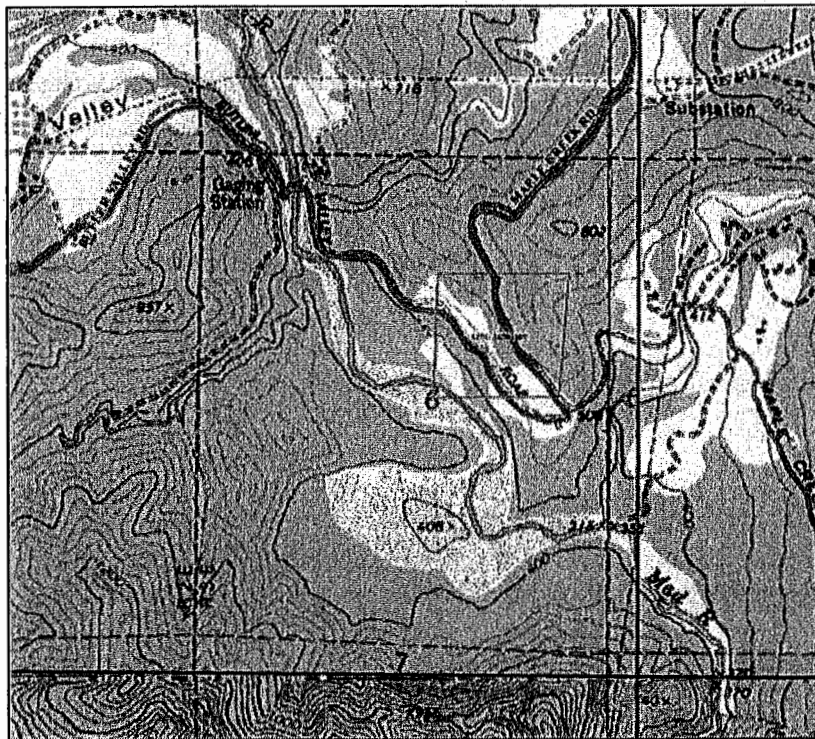
For

APN 315-011-009

Located on

**Butler Valley Road
Maple Creek, California**

November, 2018



Prepared for:

WDID# 1B16545CHUM

PWA ID# 180101020406-5173

Butler Valley Road, Maple Creek, CA

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Water Resource Protection Plan (WRPP)
APN 315-011-09
Maple Creek Road
Maple Creek, California

1.0 PROJECT SUMMARY

This report documents Pacific Watershed Associate's (PWA)¹ Water Resource Protection Plan (WRPP) for Humboldt County APN 315-011-009, located near the intersection of Maple Creek Road and Butler Valley Road, in Maple Creek, CA, as shown on Figure 1. This property is located approximately 0.7 miles west-southwest of Maple Creek, Humboldt County, CA, and hereinafter is referred to as the "Project Site." Based on either site conditions and/or total cultivation area, this property falls within **Tier 2** of the North Coast Regional Water Quality Control Board's (NCRWQCB) Order No. 2015-0023, Waiver of Waste Discharge and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects ("Order"). Properties that fall into Tier 2 of the Order are required to develop a WRPP. Therefore, as required, this WRPP has been developed for you based on site inspections made by PWA on your property. PWA's recommendations for any remediation or corrective actions are a result of water quality requirements under the Order, including Best Management Practices (BMPs) designed to meet those requirements (Appendix A). This WRPP documents the findings of site visits conducted on February 20, 2016, and August 13, 2016, by PWA Civil Engineer Leonard Job, when reconnaissance level investigations of the property was conducted and the conditions noted. Conditions at the site have been recently inspected during a mid-season site survey that was performed by PWA staff Greyson Adams and Courtney Sundberg on July 31, 2018.

2.0 CERTIFICATIONS, LIMITATIONS AND CONDITIONS

This WRPP has been prepared by, or under the responsible charge of, a California licensed professional engineer or geologist at PWA and all information herein, including treatment recommendations, are based on observations, data and information collected by PWA staff.

This WRPP has been prepared to: 1) describe the general conditions of the property at the time of our inspection; 2) summarize the site conditions and how they relate to the NCRWQCB twelve (12) Standard Conditions of the Order; 3) provide recommendations for remediation and/or correction of existing or potential water quality threats or impacts; and 4) recommend work to be conducted on this property to meet the 12 Standard Conditions of the Order. The analysis and recommendations submitted in this WRPP are based on PWA's evaluation of the Project Site and your activities which fall under the Order.

In this WRPP we have described the current conditions of the property and any water resource and water quality risk factors we observed at the time of our site inspection. PWA is not responsible for problems or issues we did not observe on our site inspection, or for changes that have naturally

¹ PWA is an approved Third Party Program for the North Coast Regional Water Quality Control Board's (NCRWQCB) Order No. 2015-0023, Waiver of Waste Discharge and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects ("Order").

occurred or been made to the property after our site review. The interpretations and conclusions presented in this WRPP are based on a reconnaissance level site investigation of inherently limited scope. Observations are qualitative, or semi-quantitative, and confined to surface expressions of limited extent and artificial exposures of subsurface materials. Interpretations of problematic geologic, geomorphic or hydrologic features such as unstable hillslopes, erosional processes and water quality threats are based on the information available at the time of our inspection and on the nature and distribution of existing features we observed on the property.

We have also included recommendations for remediation and/or correction that are based on these observations. The recommendations included in this WRPP are professional opinions derived in accordance with current standards of professional practice, and are valid as of the date of field inspection. No other warranty, expressed or implied, is made. Furthermore, to ensure proper applicability to existing conditions, the information and recommendations contained in this report shall be regularly reevaluated and it is the responsibility of the landowner and/or lessee operating under the Order to ensure that no recommendations are inappropriately applied to conditions on the property that have changed since the recommendations were developed.

If site conditions have changed for any reason, the site should be reevaluated and the WRPP revised and updated as required. These conditions include any changes in land management activities or property conditions that have occurred since our site visit (regardless of what they are, how they occurred or who performed them). Similarly, if the landowner/lessee uses portions of this property not identified or covered under the current WRPP, this Water Resource Protection Plan will need to be updated with the new information, including possible additions or changes to the recommended remedial or corrective actions and BMPs (Appendix A).

If the property owner has enrolled their property under the Order, they are responsible for complying with all the requirements thereunder, regardless of who is operating or cultivating on that property. If the property is being formally or informally leased to an operator, and the lessee has enrolled under the Order, then the lessee is responsible for complying with the Order's requirements, including the WRPP and related recommendations and requirements. If the lease expires or the lessee is not otherwise available or does not respond to information requests by the NCRWQCB or PWA, then the landowner automatically assumes responsibility under the Order for the requirements therein and for all related penalties or actions brought by the NCRWQCB.

If at any time in the future the property is to transfer ownership, it is the responsibility of the current owner, or their representatives, to ensure that the information and recommendations contained herein are called to the attention of any future owner or agent for the property. Unless this WRPP is modified by the NCRWQCB, or another approved Third Party Program representative, the findings and recommendations contained in this WRPP shall be utilized as a tool while implementing the recommendations made within this WRPP. Necessary steps shall be taken to see that contractor(s) and subcontractor(s) carry out such recommendations in the field in accordance with the most current WRPP and BMP standards.

As a Third Party Program, PWA will be responsible for the data, interpretations and recommendations developed by PWA, but will not be responsible for the interpretation by others of that information, for implementation of corrective actions by others, or for additional or

modified work arising out of those plans, interpretations and recommendations. PWA assumes no liability for the performance of other workers or suppliers while following PWA's recommendations in the WRPP, unless PWA is under contract to perform or oversee those activities. Additionally, PWA is not responsible for changes in applicable or appropriate standards beyond our control, such as those arising from changes in legislation or regulations, or the broadening of knowledge which may invalidate or alter any of our findings or recommended actions.

Any WRPP plan review or construction management services that may be needed or identified in the recommendations sections of this report are separate tasks from the preparation of this WRPP, and are not a part of the contract under which this WRPP was prepared. If requested, additional PWA field inspections, surveys, WRPP revisions/updates, project layout, design, permitting, construction oversight/management, or other related services arising from tasks described and recommended in the WRPP may be performed under separate agreements requiring advance notice and contracting.

PWA's services consist of professional opinions and recommendations made in accordance with generally accepted principles and practices. No warranty, expressed or implied, or merchantability or fitness, is made or intended in connection with our work, by the proposal for consulting or other services, or by the furnishing of oral or written reports or findings. If the client desires assurances against project failures, they shall obtain appropriate insurance through their own insurance broker or guarantor.

This WRPP is considered a living document and shall be updated at least annually, or sooner if conditions have changed or land management actions have been undertaken after our site inspection. As an official part of the Waiver Program, this WRPP (including all its text, appendices, maps and photos) shall remain onsite and available for NCRWQCB staff to inspect and review upon request.

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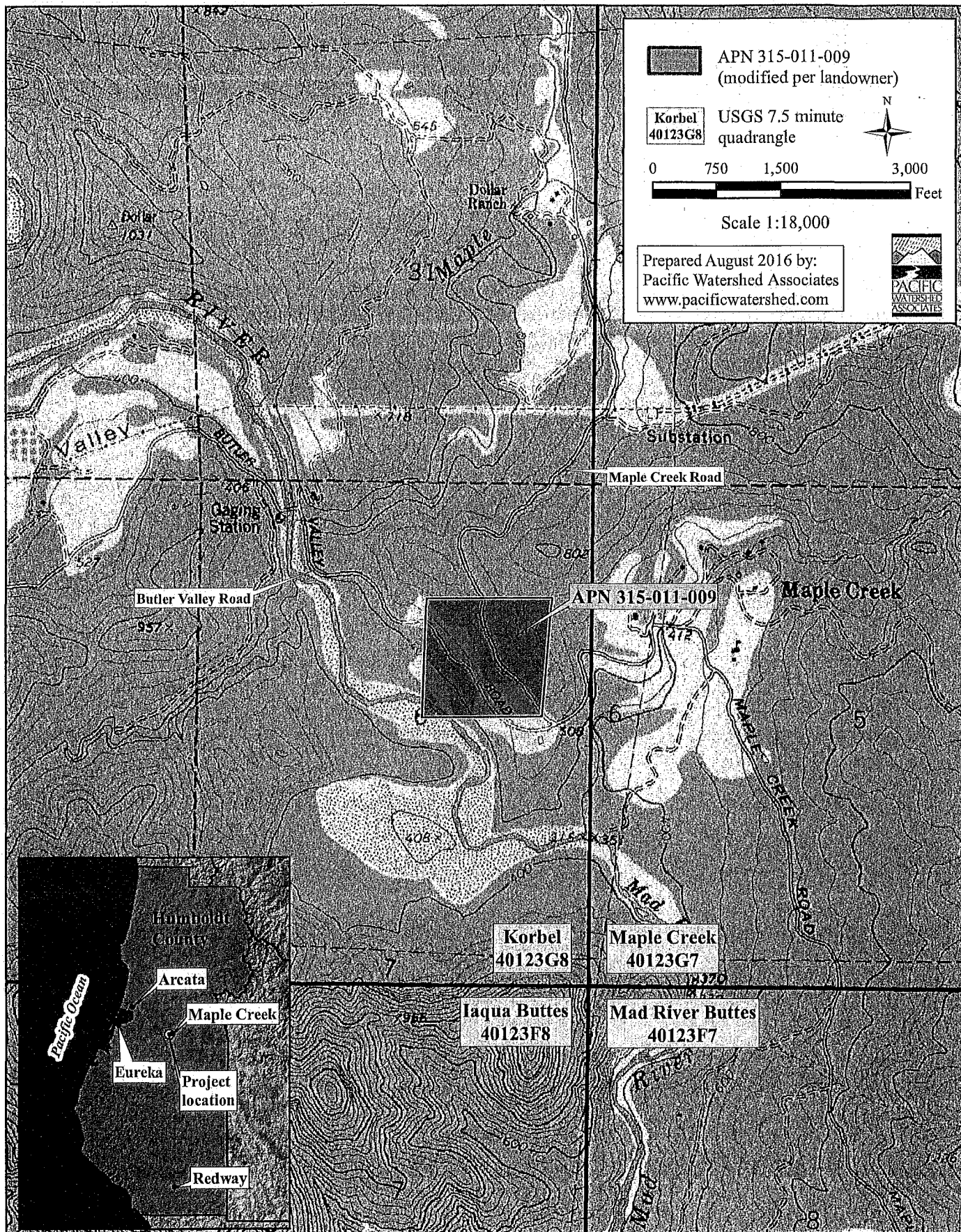


Figure 1. Location map for WDID #1B16545CHUM, APN 315-011-009, located off Maple Creek Road, Maple Creek, Humboldt County, California.

INTRODUCTION

This Water Resources Protection Plan (WRPP) summarizes the results of Pacific Watershed Associates' (PWA) site visits and subsequent analysis and documentation of site conditions on Humboldt County APN 315-011-009, located near the intersection of Maple Creek Road and Butler Valley Road, in Maple Creek, California, as shown on Figure 1 and hereinafter referred to as the "Project Site." The WRPP describes and addresses the required elements and compliance with the 12 Standard Conditions established by the North Coast Regional Water Quality Control Board's (NCRWQCB) Order No. 2015-0023 to protect water quality from cannabis cultivation and related activities (Order). PWA has identified certain areas where the Project Site does not fully meet all 12 of the Standard Conditions of the Order. Section 4, below, identifies and discusses each of the 12 Standard Conditions as related to your property with regard to compliance with the NCRWQCB's Order.

The WRPP contains the following required sections:

1. Map (Figure 2) depicting the required site elements and features associated with the 12 Standard Conditions of the Order;
2. Description of current site conditions, compliance with the 12 Standard Conditions, and prioritized remediation or corrective actions needed to bring the site into compliance with the requirements of the Order;
3. A monitoring and inspection plan to ensure BMPs used to protect and prevent impacts to water quality are being implemented as recommended by PWA (implementation monitoring), and that they are effective (effectiveness monitoring);
4. A water use plan, including water sources, water use and storage rights documentation, monthly water use documentation (quantity), and water conservation measures that are employed to prevent adverse impacts to water quality and water quantity in the watershed;
5. List of fertilizers and chemicals stored and used onsite, including a log of the frequency and quantity of these materials used.

4.0 STANDARD CONDITIONS CHECKLIST FOR 315-011-009 AS OF 7/31/2018

The NCRWQCB has developed a set of 12 Standard Conditions that shall be followed and implemented to protect and improve water quality as required under the NCRWQCB's Order. For a property to become compliant with the Order, all 12 Standard Conditions must be fully satisfied.

The following section details the specific requirements listed and described in the Order for each of the 12 Standard Conditions. Each Standard Condition has from 1 to 6 sub-requirements (*listed in italic type*), each of which must be satisfied to protect water quality and comply with the Order. The checklist developed by PWA for your property indicates: 1) whether the Standard Condition or Standard Condition sub-requirement was adequately met as of the date of PWA's field inspection, 2) PWA's observations and comments related to the Standard Condition or Standard Condition sub-requirement, 3) whether a relevant photo has been taken and included in the WRPP, and 4) recommended corrective or remedial actions that need additional work to meet the requirements of the Order.

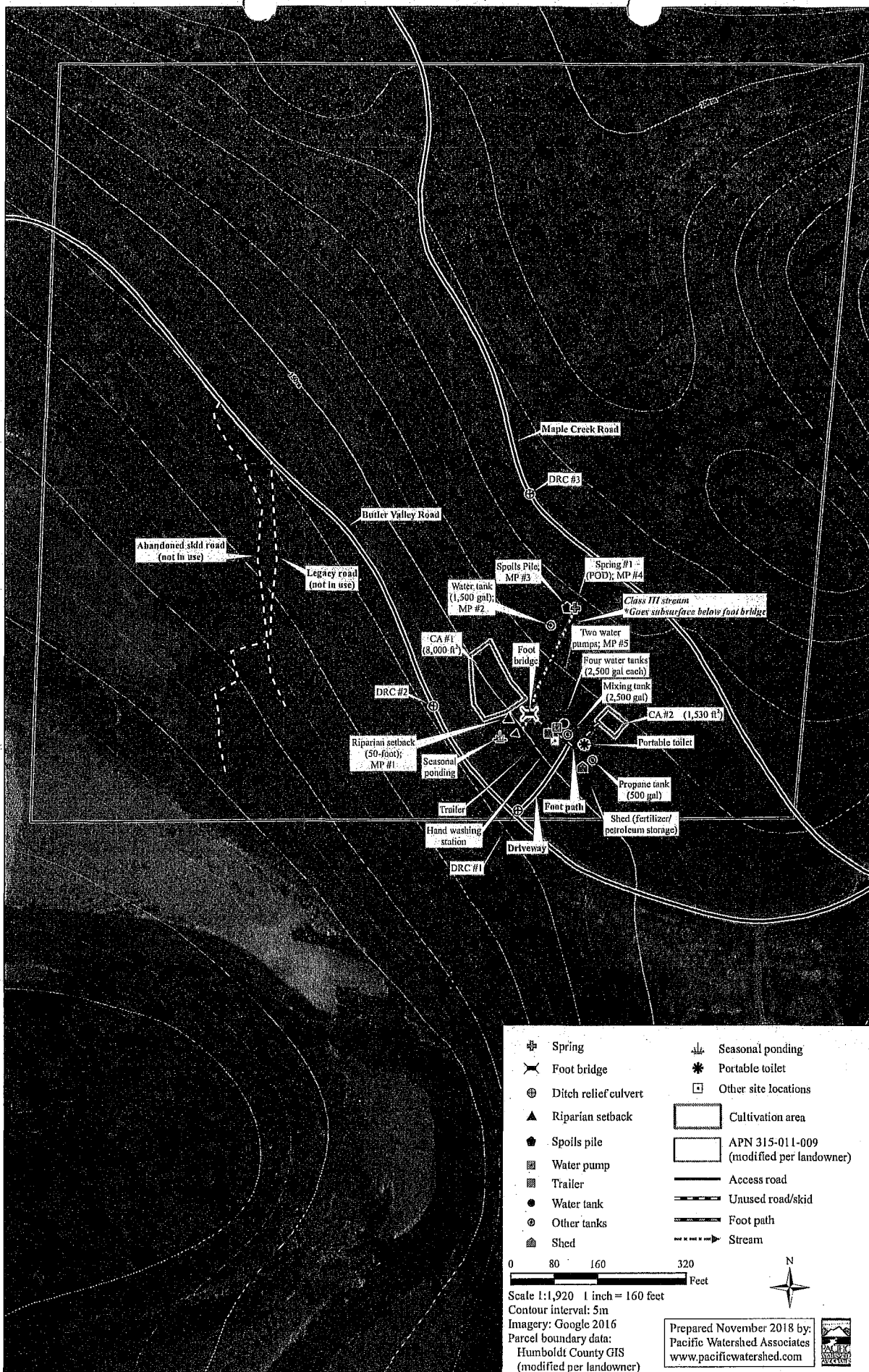


Figure 2. Site map for WDID #1B16545CHUM, APN 315-011-009, located off Maple Creek Road, Map Creek, Humboldt County, California.

In Section 5 of this WRPP, PWA has provided a summary prioritized list (Table 1) of the recommended treatments and actions to be implemented by you to meet the requirements of the Order. PWA will consult with you to review the WRPP document and findings, and to set a preliminary schedule for implementation of the recommended measures for achieving compliance with the Order. Please note that some of the PWA recommended actions are based on regulatory requirements and deadlines, while others can be scheduled to fit the needs of both you and your property.

4.1 Standard Condition #1. Site Maintenance, Erosion Control and Drainage Features

- a) *Roads shall be maintained as appropriate (with adequate surfacing and drainage features) to avoid developing surface ruts, gullies, or surface erosion that results in sediment delivery to surface waters.*

Meets condition? Yes

Observations/Comments: Approximately 0.66 mi. of Project Site road was inspected, comprised of a driveway and a legacy road. The County-maintained Butler Valley Road and Maple Creek Road were also reviewed. The 160-foot-long driveway on the Project Site is mildly sloping, and has been surfaced with gravel. The operator reported that there will be minimal use of the driveway during the rainy season. There are no dwellings or overnight facilities on the Project Site. A legacy road and an abandoned skid trail to the Mad River leading down from Butler Valley Road is completely revegetated with bushes and trees, and does not show signs of surface erosion.

Photos: Photo 1

Corrective or remedial actions needed: None

- b) *Roads, driveways, trails, and other defined corridors for foot or vehicle traffic of any kind shall have adequate ditch relief drains or rolling dips and/or other measures to prevent or minimize erosion along the flow paths and at their respective outlets.*

Meets condition? Yes

Observations: Humboldt County maintains Butler Valley Road and Maple Creek Road. There were three ditch relief culverts but no identified stream crossings (Figure 2). There is one culvert across the driveway on Butler Valley Road (DRC #1) and one DRC on Maple Creek Road (DRC #3). A third DRC is downslope from the wetland and seasonal ponding area (DRC #2). The driveway has a well-maintained gravel surface with a low gradient. There is one legacy road on the parcel located south of Butler Valley Road. The legacy road is heavily vegetated with small trees, and shows no stream crossings and no signs of surface erosion.

Photos: Photos 2 and 3

Corrective or remedial actions needed: None

- c) *Roads and other features shall be maintained so that surface runoff drains away from potentially unstable slopes or earthen fills. Where road runoff cannot be drained away from an unstable feature, an engineered structure or system shall be installed to ensure that surface flows will not cause slope failure.*

Meets condition? N/A

Observations/Comments: The slopes on the site are mild. No unstable slopes or earthen fills were noted on the site.

Photos: None

Corrective or remedial actions needed: None

- d) *Roads, clearings, fill prisms, and terraced areas (cleared/developed areas with the potential for sediment erosion and transport) shall be maintained so that they are hydrologically disconnected, as feasible, from surface waters, including wetlands, ephemeral, intermittent and perennial streams.*

Meets condition? No

Observations/Comments: A wetland is located along a poorly defined drainage path between Spring #1 that extends in a southwest direction towards Butler Valley Road and terminates in a wet area with seasonal ponding and no defined channel. Cultivation Area #1 slopes to the southwest towards Butler Valley Road (away from the wetland). The driveway, parking and water storage tanks also slope to the southwest. The ground surface looks disturbed due to previous activities adjacent to the wetland area and adjacent to CA #1.

Photos: Photo 4, MP #1

Corrective or remedial actions needed: The wetland area near CA #1 will need to be protected with a 50 ft buffer and revegetated wherever it was disturbed (see 4.3a, below).

- e) *Ditch relief drains, rolling dip outlets, and road pad or terrace surfaces shall be maintained to promote infiltration/dispersal of outflows and have no apparent erosion or evidence of soil transport to receiving waters.*

Meets condition? Yes

Observations/Comments: No surface erosion caused by a lack of road drainage structures was observed. The inlets and outlets of the DRCs were well vegetated.

Photos: Photos 2 and 3

Corrective or remedial actions needed: None

- f) *Stockpiled construction materials are stored in a location and manner so as to prevent their transport to receiving waters.*

Meets condition? Yes

Observations/Comments: No construction materials were located on the Project Site.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #1. - General comments and recommendations: Maintain the gravel surface of the driveway, to minimize tracking of soil onto Butler Valley Road during the wet season.

4.2 Standard Condition #2. Stream Crossing Maintenance

- a) *Culverts and stream crossings shall be sized to pass the expected 100-year peak streamflow.*

Meets condition? N/A

Observations/Comments: No stream crossings are located on the Project Site.

Photos: None

Corrective or remedial actions needed: None

- b) *Culverts and stream crossings shall be designed and maintained to address debris associated with the expected 100-year peak streamflow.*

Meets condition? N/A

Observations/Comments: There are no stream crossings on the Project Site.

Photos: None

Corrective or remedial actions needed: None

- c) *Culverts and stream crossings shall allow passage of all life stages of fish on fish-bearing or restorable streams, and allow passage of aquatic organisms on perennial or intermittent streams.*

Meets condition? N/A

Observations/Comments: No stream crossings are located on the Project Site.

Photos: None

Corrective or remedial actions needed: None

- d) *Stream crossings shall be maintained so as to prevent or minimize erosion from exposed surfaces adjacent to, and in the channel and on the banks.*

Meets condition? N/A

Observations/Comments: No stream crossings are located on the Project Site.

Photos: No

Corrective or remedial actions needed: None

- e) *Culverts shall align with the stream grade and natural stream channel at the inlet and outlet where feasible.*

Meets condition? N/A

Observations/Comments: No stream crossings are located on the Project Site.

Photos: None

Corrective or remedial actions needed: None

- f) *Stream crossings shall be maintained so as to prevent stream diversion in the event that the culvert/crossing is plugged, and critical dips shall be employed with all crossing installations where feasible.*

Meets condition? N/A

Observations/Comments: No stream crossings are located on the Project Site.

Photos: None

Corrective or remedial actions needed: None

4.3 Standard Condition #3. Riparian and Wetland Protection and Management

- a) *For Tier 1 Dischargers, cultivation areas or associated facilities shall not be located within 200 feet of surface waters. While 200 foot buffers are preferred for Tier 2 sites, at a minimum, cultivation areas and associated facilities shall not be located or occur within*

100 feet of any Class 1 or 2 watercourse or within 50 feet of any Class 3 water course or wetlands.

Meets condition? No

Observations/Comments: PWA observed that closest point of active operations to any surface water is Cultivation Area #1 (see Figure 2), which is approximately 25 feet from the wetland vegetation. The 1,500 gallon water tank near Spring #1 is also within the 50 ft. buffer of the Class III watercourse.

Photos: MP #1, Photo 4; MP #2, Photo 11

Corrective or remedial actions needed: Have a wetland biologist determine the extent of the wetland riparian areas on the Project Site. These areas, and the small Class III watercourse, should be protected by a minimum 50-foot buffer. Remove all facilities and cultivation areas, including cultivation-related wastes, within 50 feet of the wetland boundary and within 50 ft of the Class III watercourse. See also *General comments and recommendations*, below.

- b) *Buffers shall be maintained at natural slope with native vegetation.*

Meets condition? No

Observations/Comments: The riparian buffer adjacent to the wetland appears to have been disturbed near the foot bridge.

Photos: Photo 4

Corrective or remedial actions needed: Remove cultivation area and other facilities from the 50 wetland and stream buffer areas. Once removed, revegetate the disturbed wetland and wetland buffer areas with wetland and riparian species, and protect them from further disturbance from cultivation-related operations. Remove the footbridge during the wet season and revegetate any disturbed areas within the 50 ft buffer areas. See also 4.2a, above, and *General comments and recommendations*, below.

- c) *Buffers shall be of sufficient width to filter wastes from runoff discharging from production lands and associated facilities to all wetlands, streams, drainage ditches, or other conveyances.*

Meets condition? No

Observations/Comments: The cultivation areas and most on-site facilities do not drain to the wetland. However, some cultivation and related facilities are within the 50 ft wetland and stream buffer.

Photos: MP #1, Photo 4; MP #2, Photo 11

Corrective or remedial actions needed: See 4.2a, above.

- d) *Riparian and wetland areas shall be protected in a manner that maintains their essential functions, including temperature and microclimate control, filtration of sediment and other pollutants, nutrient cycling, woody debris recruitment, groundwater recharge, streambank stabilization, and flood peak attenuation and flood water storage.*

Meets condition? No

Observations/Comments: See 4.3.a., above.

Photos: MP #1, Photo 4; MP #2, Photo 11

Corrective or remedial actions needed: See 4.3.a., above.

Standard Condition #3. - General comments and recommendations: Certain cultivation areas and/or other related facilities on this Project Site do not meet the setback or buffer area requirements to be achieved and maintained under the North Coast Water Quality Control Board's (NCRWQCB) Waiver of Waste Discharge (Order) (see 4.3a, above). However, if you are participating in the County Land Use planning and permitting process, the Humboldt County Planning Department (County) also requires that no infrastructure be moved at this time to maintain consistency in the process of evaluating and approving a pending land use applications on file for properties in Humboldt County.

The Schedule of Corrective Actions listed in Table 1 of this WRPP specifies the date by which cultivation areas and related facilities now located within stream buffers should be removed from those riparian buffer areas. That WRPP Table 1 schedule and date of removal should be followed by everyone who is not a part of the County land use planning permit process.

If you are applying under County's land use permitting process and have been specifically directed not to remove or move infrastructure, the following interim measures shall be applied until its removal has been approved:

- (1) Obtain a written note from the County stating that you are directed not to remove the infrastructure within stream buffer areas on the Project Site; keep that note with your WRPP.
- (2) All cultivation waste and spent soils should be removed and stored outside the buffer areas during the winter period as per recommendations included elsewhere in this WRPP.
- (3) All petroleum products, fertilizers, and other chemicals that are stored within the buffer area(s) must be moved to proper storage facilities outside stream buffers elsewhere on the Project Site, and as recommended elsewhere in the WRPP.
- (4) Use timed or volume limited drip irrigation for all watering of cultivation areas that fall within stream buffer areas.
- (5) Minimize soil disturbances and bare earth areas within these cultivation areas; seed and mulch all bare earth prior to October 31 each year.
- (6) Maintain native grassy buffers and/or dense riparian vegetation between these cultivation areas and the potential receiving waterbody.
- (7) Prior to October 31, planting beds and planting pots containing spent soils or amendments should be either 1) fully tarped or 2) planted with heavy cover crops during the wet season to minimize surface runoff and leaching of nutrients. If cover crops cannot be maintained due to cold weather, the beds/pots should be fully tarped.
- (8) Regularly monitor the subject garden area and related facilities to assure the interim measures are effective and adaptively manage the area to minimize or eliminate surface runoff and potential impacts to water quality.

4.4 Standard Condition #4. Spoils Management

- a) *Spoils shall not be stored or placed in or where they can enter any surface water.*

Meets condition? No

Observations/Comments: Spoils were observed during the 2018 inspection at a distance of 10 feet from Spring #1. The operator stated that this pile is from digging out

the spring during annual maintenance. Also, the ground surface was leveled to provide a stable footing for the four 2,500-gallon water storage tanks. The excess soil was piled to the north of the tanks and has been stabilized with vegetation.

Photos: MP #3, Photo 6

Corrective or remedial actions needed: Remove and stabilize spoils excavated during annual maintenance of Spring #1 Point of Diversion. Remove any excavated material that could erode and deliver sediment to the watercourse or to the water intake or point of diversion. Seed and mulch all bare soils areas within 50 feet of the disturbed site. Appendix A contains BMPs that can be used to stabilize spoils from maintenance of the spring. PWA recommends BMP 91-100, Appendix A, Part D. Spoils Management.

- b) *Spoils shall be adequately contained or stabilized to prevent sediment delivery to surface waters.*

Meets condition? No

Observations/Comments: There is limited threat to surface waters from the spoils pile near the spring.

Photos: MP #3, Photo 6

Corrective or remedial actions needed: See corrective 4.4a, above.

- c) *Spoils generated through development or maintenance of roads, driveways, earthen fill pads, or other cleared or filled areas shall not be sidecast in any location where they can enter or be transported to surface waters.*

Meets condition? Yes

Observations/Comments: Maintenance of the POD #1 (Spring #1) has resulted in spoils being deposited within 10 feet of the watercourse and spring. Sidecast spoils were also observed near the water storage tanks, but are stabilized with vegetation cover, and are not located where sediment can be transported to surface waters.

Photos: MP #3, Photo 6

Corrective or remedial actions needed: See corrective 4.4a, above.

4.5 Standard Condition #5. Water Storage and Use

- a) *Size and scope of an operation shall be such that the amount of water used shall not adversely impact water quality and/or beneficial uses, including and in consideration with other water use operations, instream flow requirements and/or needs in the watershed, defined at the scale of a HUC 12 watershed or at a smaller hydrologic watershed as determined necessary by the Regional Water Board Executive Officer.*

Meets condition? No

Observations/Comments: Most water for irrigation comes from a shallow (<8 feet) excavated spring (Spring #1). The spring is >100 feet higher in elevation than the surface of the Mad River. An estimated 1,500 gallons of water per week is used during the peak irrigation season. Four tanks totaling 10,000 gallons of water storage were located on the Project Site at the time of our site inspection, plus a 2,500 mixing tank and a 1,500 gallon settling tank, for a total of 14,000 gallons total storage capacity. Water is also reportedly brought to the site from a permitted off-site well during the late part of the growing season.

Approximately 9,000 SF of cultivation area was located on the Project Site at the time of the site inspection. At an estimated average of 10 gal/ft²/year for the cannabis growing season (estimated water consumption rate based on Humboldt County Planning and Building Department data, and data collected by PWA), the operator would require approximately 90,000 gallons of water storage to supply current cultivation operations during the forbearance period from May 15 to October 31 each year. If forbearance is required, 76,000 gallons of additional water storage capacity would be required to supply sufficient irrigation water for 9,000 ft² of cannabis cultivation during the forbearance period from May 15 to October 31.

The owner proposes that the cultivation area expand to up to one-half acre (21,780 ft²). This would increase needed water storage to a total of 217,800 gallons (proposed area x 10 gal/ft²) for the 0.5 acres (21,780 ft²) of cultivation. The operator is proposing to install four (approximately) 54,000 gallon rainwater tanks, increasing the water storage capacity to 230,000 gallons.

Photos: MP #4, Photos 7 and 8

Corrective or remedial actions needed: Under the Order, you are required to measure, document and report the water you divert (and pump from a well or or truck in), store and use throughout the year. PWA has created a simple log sheet to help you monitor this water data for your Project Site (Appendix D). This water monitoring data is required to be reported to the NCRWQCB by or before each March 31 for the preceding calendar year. PWA highly recommends, and state agencies may require, that you install flow meters on your water tanks to accurately document your water diversion and use volumes over time. Add an estimated 76,000 gallons of additional onsite water storage to meet the irrigation needs as projected in the preliminary Water Budget. Refine this required water storage estimate using detailed water monitoring and employing water meters on your water diversion and records for any continuing water truck deliveries. See Section 7.0, Water Use Plan, below. Finally, if you continue to use the spring as a water source, rebuild the POD with a permanent spring box to minimize annual maintenance disturbances.

- b) *Water conservation measures shall be implemented. Examples include use of rainwater catchment systems or watering plants with a drip irrigation system rather than with a hose or sprinkler system.*

Meets condition? Yes

Observations/Comments: Water conservation methods reportedly include the use of timed drip irrigation, straw mulch, and irrigation scheduling (watering in the late afternoon or early morning). Float valves are installed in each water storage tank to prevent overtopping and leaking.

Photos: Photo 9

Corrective or remedial actions needed: Additional water conservation measures should be investigated and employed, as applicable, to minimize water diversion and use, including: 1) the use of cover crops during rotations and winter, to protect and increase soil fertility; 2) the use of compost and mulch fertilizer to improve soil structure and increase its water-holding capacity; 3) the use of water retaining soil mediums and native soil during the initial soil preparation at the start of the season to better retain moisture and therefore limit the frequency of irrigation; and 4) planting in-

ground and not in above-ground pots so as to limit evaporative losses. PWA further recommends increasing rainwater harvesting activities and adding rainwater-fed storage facilities sufficient to meet dry season irrigation needs. To reduce or eliminate dry season water diversion, you should investigate the possibility of developing an off-stream pond that can be filled through rainwater harvesting during the winter season.

- c) *For Tier 2 Dischargers, if possible, develop off-stream storage facilities to minimize surface water diversion during low flow periods.*

Meets condition? Yes

Observations/Comments: The landowner has installed four 2,500-gallon water storage tanks, one 2,500 gallon mixing tank, and one 1,500-gallon sediment settling tank on the Project Site, totaling 14,000 gallons of total water storage capacity all of which are located off-stream.

Photos: Photos 9-12

Corrective or remedial actions needed: The operator is proposing to install four (approximately) 54,000 gallon rainwater tanks, increasing the water storage capacity to 230,000 gallons.

- d) *Water is applied using no more than agronomic rates.*

Meets condition? Yes

Observations/Comments: The Project Site is being irrigated using timed drip emitters. No evidence of unnecessary watering was observed.

Photos: Photos 13-14

Corrective or remedial actions needed: To verify compliance and further refine water use efficiency, start measuring and recording your average water usage on a per plant basis, based on type and size of plant pot, full term versus short season (light deprivation) plant, and type of irrigation. Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration is avoided.

- e) *Diversion and/or storage of water from a stream should be conducted pursuant to a valid water right and in compliance with reporting requirements under Water Code section 5101.*

Meets condition? No

Observations/Comments: PWA observed that the spring water flows in a southwesterly direction through a wetland area to a bowl-shaped area where shallow ponding and infiltration occurs during the winter months. This ponding area did not appear to have a drainage route leaving the property and there was no stream crossing on Butler Valley Road.

Photos: Photo 15

Corrective or remedial actions needed: Water diversion and water storage requires valid water rights documentation. As opposed to employing one or more surface water diversions and securing various water rights, consider obtaining irrigation water for your agricultural needs by developing rainwater capture systems to fill rigid water tanks and/or one or more off-stream, rainwater-fed ponds, or drilling a well.

Domestic water rights: If you plan to continue flow diversions for your domestic water needs, you will need to file, obtain, and maintain water rights for your parcel. File an Initial Statement of Diversion and Use (ISDU), see below) and apply for the Small Domestic Use Appropriation (SDU) for the stream diversion to cover your domestic use requirements such as drinking, bathing, cooking and fire control. According to regulatory requirements, this type of water right cannot be used for commercial crop irrigation. Appropriate domestic water rights applications to be filed with the State Water Resources Control Board (SWRCB) include:

- Initial Statement of Diversion and Use (ISDU)

http://www.waterboards.ca.gov/waterrights/water_issues/programs/diversion_use/docs/intl_stmnt_form.pdf

- Small Domestic Use (SDU) Appropriation Registration

http://www.waterboards.ca.gov/waterrights/publications_forms/forms/docs/sdu_registration.pdf

You will need to submit annual water diversion and use volumes to the NCRWQCB by each March 31 for the preceding calendar year, and to the State Water Resources Control Board, Division of Water Rights (SWRCB, DWR) for supplemental reporting required for the Annual Statement of Diversion and Use (ISDU) by June 30 of each year.

Agricultural (cannabis) water rights: If you plan to continue flow diversions for your agricultural water needs, you need to file and obtain water rights from the State Water Resources Control Board, Division of Water Rights (SWRCB, DWR) using their Small Irrigation Use (SIU) water right registration program for commercial cannabis cultivation. PWA recommends that you apply for this Small Irrigation Use water right for cannabis cultivators:

https://www.waterboards.ca.gov/water_issues/programs/cannabis/cannabis_water_rights.shtml

There is an online application portal for this program located at:

<https://public2.waterboards.ca.gov/cgo>

Fish and Wildlife impacts: If you are directly diverting water from a jurisdictional spring or stream, pumping water from a hydrologically connected well, capturing surface water in a pond, or modifying any stream crossings or channel works on the Project Site you will need to obtain a consultation with California Department of Fish and Wildlife (CDFW) and file the notification for a CDFW Lake and Streambed Alteration Agreement (LSAA):

<https://www.wildlife.ca.gov/Conservation/LSA>

- f) *Water storage features, such as ponds, tanks, and other vessels shall be selected, sited, designed, and maintained so as to insure integrity and to prevent release into waters of the state in the event of a containment failure.*

Meets condition? Yes

Observations/Comments: The water storage tanks are located in a stable, mildly sloping area. The proposed rainwater tanks will be sited on a concrete pad.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #5 – General comments and recommendations: Humboldt County Land Use Regulations (Ordinance No. 2599, 314-55.4.12.2.5) restricts water delivery to emergency situations only. Continue to closely monitor water use throughout the growing season to help you find out how much storage you will require to meet the forbearance requirements and conditions of this Order and other permit requirements. PWA has created a simple log sheet (Appendix D) to help you monitor your water usage. Implement a Water Monitoring Plan by measuring and recording your water diversion(s) and truck delivery volumes, water storage volumes, and water use. Employ water meters to document your diversion volumes and to record the timing and volume of water piped to your cultivation areas and places of domestic water use.

4.6 Standard Condition #6. Irrigation Runoff

- a) *Implementing water conservation measures, irrigating at agronomic rates, applying fertilizers at agronomic rates and applying chemicals according to the label specifications, and maintaining stable soil and growth media should serve to minimize the amount of runoff and the concentration of chemicals in that water. In the event that irrigation runoff occurs, measures shall be in place to treat/control/contain the runoff to minimize the pollutant loads in the discharge. Irrigation runoff shall be managed so that any entrained constituents, such as fertilizers, fine sediment and suspended organic particles, and other oxygen consuming materials are not discharged to nearby watercourses. Management practices include, but are not limited to, modifications to irrigation systems that reuse tailwater by constructing off-stream retention basins, and active (pumping) and or passive (gravity) tailwater recapture/redistribution systems. Care shall be taken to ensure that irrigation tailwater is not discharged towards or impounded over unstable features or landslides.*

Meets condition? Yes

Observations/Comments: The operator stated that drip irrigation occurs at agronomic rates. Runoff that theoretically might flow from the cultivation area could not threaten surface water due to the flat and wide vegetative buffer, and the roadway separating the cultivation area from the river. Also see Standard Condition 4.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #6 – General comments and recommendations: Agronomic rates are those rates of application of water, fertilizers and other amendments that are sufficient for utilization by the crop being grown, not rates that would result in surface runoff or infiltration below the root zone of the crop being grown.

4.7 Standard Condition #7. Fertilizers and Soil Amendments

- a) *Fertilizers, potting soils, compost, and other soils and soil amendments shall be stored in locations and in a manner in which they cannot enter or be transported into surface waters and such that nutrients or other pollutants cannot be leached into groundwater.*

Meets condition? Yes

Observations/Comments: A very limited amount of fertilizer is stored in the trailer during the growing season. Agricultural supplements are acquired as needed from a retailer, and only unused portions of single containers are stored in the trailer.

Photos: Photo 16

Corrective or remedial actions needed: Bulk or bagged potting soils, soil amendments and fertilizers shall be stored within a water tight building or covered area not exposed to the elements or, if stored outdoors, fully tarped and off the ground in a stable location with no chance of runoff to surface waters or nutrient leaching or delivery to groundwater.

- b) *Fertilizers and soil amendments shall be applied and used per packaging instructions and/or at proper agronomic rates.*

Meets condition? Unknown

Observations/Comments: Based on verbal communication with the cultivator, the recommended application rates are being followed.

Photos: None

Corrective or remedial actions needed: To verify compliance with this condition, you are required by the Order to keep detailed records of the type, timing and volume of any fertilizers and/or other soil amendments you use in your operations. They can be recorded on log sheets such as those provided in Appendix E. Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration of water and nutrients is avoided.

- c) *Cultivation areas shall be maintained so as to prevent nutrients from leaving the site during the growing season and post-harvest.*

Meets condition? Unknown

Observations/Comments: There are numerous above-ground pots containing potting soils and amendments. Soil nutrients were reported to be prevented from leaving the site by cultivating a cover crop during the rainy season and timed drip watering during the growing season.

Photos: None

Corrective or remedial actions needed: To prevent nutrient leaching, either: 1) plant dense cover crops in spent pots, holes and beds to enrich soil and lock up nutrients; 2) fully tarp any piles of exposed soils and growing mediums during the winter season; and/or 3) move spent soils and amendments inside or under a roof to temporarily store them during the wet season (November 1 – May 15). If dense cover crops cannot be kept alive, all planted areas should be tarped to protect them from rainfall, snowmelt and subsequent infiltration and leaching of nutrients. Unused soil amendments, potting soils, compost and fertilizers should be stored under a roof or fully tarped during the wet season such that they are protected from the elements. To confirm compliance with this Standard Condition, provide winter time (wet season) photos of the cultivation areas showing treatments and include them with the WRPP, Appendix B (Monitoring and Reporting).

Standard Condition #7 – General comments and recommendations: To the extent feasible, do not store fertilizers and chemicals together with petroleum products (see Standard Condition 4.9). Proper storage of hazardous materials (e.g., flammable liquids or

gasses, many agricultural chemicals, oxidizers, acids, caustic substances) is essential for maintaining safe operations and for protection of the environment.

4.8 Standard Condition #8. Pesticides/Herbicides

- a) *At the present time, there are no pesticides or herbicides registered specifically for use directly on cannabis and the use of pesticides on cannabis plants has not been reviewed for safety, human health effects, or environmental impacts. Under California law, the only pesticide products not illegal to use on cannabis are those that contain an active ingredient that is exempt from residue tolerance requirements and either registered and labeled for a broad enough use to include use on cannabis or exempt from registration requirements as a minimum risk pesticide under FIFRA section 25(b) and California Code of Regulations, title 3, section 6147. For the purpose of compliance with conditions of this Order, any uses of pesticide products shall be consistent with product labelling and any products on the site shall be placed, used, and stored in a manner that ensures that they will not enter or be released into surface or ground waters.*

Meets condition? Yes

Observations/Comments: Neither pesticides nor herbicides were observed on the property at the time of our inspection. The landowner stated that only organic chemicals are employed, and that recommended manufacturers application rates are followed.

Photos: None

Corrective or remedial actions needed: Under the Order you are required to keep records (logs) of the type, timing and volume of pesticides and herbicides used in your operations. This can be done using a simple log form, such as the one included in Appendix F. Additionally, for any pesticide use you must comply with any Pesticide Registration Requirements. See Appendix E2 included in the NCRWQCB Order, or on their web site at:

http://www.waterboards.ca.gov/northcoast/board/decisions/adopted_orders/pdf/2015/150728_Appendix_E2_DPR_MJ%20Pesticide%20Handout.pdf

Standard Condition #8 – General comments and recommendations: When present, pesticides and herbicides should be stored within enclosed buildings in such a way they cannot enter or be released into surface or ground waters. For the health of the environment and your workers, you are encouraged to utilize organic or biologic controls, rather than highly toxic petro-chemicals, to prevent pest and mildew problems. Several safe alternatives are available.

4.9 Standard Condition #9. Petroleum Products and other Chemicals

- a) *Petroleum products and other liquid chemicals, including but not limited to diesel, biodiesel, gasoline, and oils shall be stored so as to prevent their spillage, discharge, or seepage into receiving waters. Storage tanks and containers must be of suitable material and construction to be compatible with the substance(s) stored and conditions of storage such as pressure and temperature.*

Meets condition? Yes

Observations/Comments: A large, professionally maintained propane tank is stored on-site. Two gas powered water pumps were observed during the site inspection. When in use, the pumps are contained in a holding tray and covered with plywood. In the event of a spill, the tray could contain the volume of fuel. Additionally, the shed is designated for fuel and fertilizer storage.

Photos: MP #5; Photos 17-19

Corrective or remedial actions needed: Continue to place all small fuel cans, generators, diesel tanks, gasoline powered garden equipment and any other items containing petroleum products under cover, off the ground and in a secondary containment basin (tote, tub, impermeable basin/floor, etc.) capable of containing the entire stored volume, and in a safe, secure location (e.g. away from slopes and outside of riparian buffers). Provide photos of fuel storage inside, under cover and with secondary containment to be compliant with the Order. Petroleum products and other liquid chemicals, including but not limited to diesel, biodiesel, gasoline, and oils should not be stored with any ammonium nitrate-based fertilizers, soil amendments, compost, and other chemicals as they are considered incompatible materials and could potentially react or be hazardous to health

- b) *Above ground storage tanks and containers shall be provided with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation.*

Meets condition? Yes

Observations/Comments: See 4.9a above.

Photos: MP #5; Photo 17- 19

Corrective or remedial actions needed: Make sure the secondary containment basins are sufficient for the volume of fuel stored at each location. PWA recommends you build more permanent structures to cover your gas powered equipment so they (and the containment basins) remain covered and dry during windy conditions.

- c) *Dischargers shall ensure that diked areas are sufficiently impervious to contain discharged chemicals.*

Meets condition? N/A

Observations/Comments: There are no diked areas on the site.

Photos: None

Corrective or remedial actions needed: None

- d) *Discharger(s) shall implement spill prevention, control, and countermeasures (SPCC) and have appropriate cleanup materials available onsite.*

Meets condition? No

Observations/Comments: No spill cleanup kit was observed onsite to help clean up small spills.

Photos: MP #5; Photo 17

Corrective or remedial actions needed: Obtain one or more spill prevention cleanup kits and keep readily available to clean up small spills. Spill kits should be located where fuel is stored and where refueling occurs.

- e) *Underground storage tanks 110 gallons and larger shall be registered with the appropriate County Health Department and comply with State and local requirements for leak detection, spill overflow, corrosion protection, and insurance coverage.*

Meets condition? N/A

Observations/Comments: No underground storage tanks are located on the site.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #9 – General comments and recommendations: Proper storage of hazardous materials (e.g., flammable liquids or gasses, many agricultural chemicals, oxidizers, acids, caustic substances) is essential for maintaining safe operations and for protection of the environment. Commercial operations that store hazardous materials are required to prepare a hazardous materials business plan (HMBP) and maintain Material Safety Data Sheets (MSDS) for each hazardous chemical that they store or use. The HMBP information must be communicated to employees annually and be kept in a location that is readily accessible by employees. MSDSs explain how to medically treat a person that has been exposed to a hazardous substance and how to safely cleanup a spill.

Hazardous liquids and chemical storage – Generally, incompatible hazardous materials must be stored in separate locations, with distinct secondary containment vessels for each type of material. Secondary containment is required for hazardous liquids and must be sized to contain a spill volume equivalent to the largest hazardous material container or 10% of the total volume, whichever is greater. Flammable and combustible hazardous materials must be separated from oxidizers by a distance of no less than 20 feet. The following guidelines should be followed when handling and storing hazardous materials.

Always label containers with the substance inside for both hazardous and non-hazardous materials. For flammable hazardous materials, make certain that an appropriate fire extinguisher is available nearby the storage area. Dry powder fire extinguishers are the most versatile. Water filled fire extinguishers should not be used on certain types of hazardous material fires (e.g. water-reactive metals, strong acids, petroleum).

- Acids (e.g., hydrochloric acid, pool cleaner, citric acid) must be segregated from:
 - ✓ Reactive metals such as sodium, potassium, magnesium, etc.
 - ✓ Flammable and combustible materials.
 - ✓ Chemicals which could generate toxic or flammable fumes when mixed.
 - ✓ Bases.
- Bases (e.g., Portland cement, lime, lye, or drain cleaner) must be segregated from:
 - ✓ Acids, metals, organic peroxides and flammable liquids, and other easily ignitable materials.
 - ✓ Solvents
 - ✓ Oxidizing acids and oxidizers.
- Oxidizers (e.g., ammonium nitrate, ammonium phosphate, oxygen gas cylinders) must be segregated from:

- ✓ Combustible and flammable liquids and gasses (e.g. petroleum, acetylene cylinders, solvents) with at least 20 feet of separation.
 - ✓ Reducing agents such as zinc, alkali metals, and formic acid.
- Flammable materials (e.g., gasoline, fuses, gunpowder, acetylene cylinders) must be segregated from:
- ✓ Oxidizers, caustic materials, acids, and bases.

It is good housekeeping practice to store compatible hazardous materials exclusively away from agricultural chemicals. Although uncommon, even some organic agricultural amendments may be reactive, caustic, ignitable, or corrosive. Segregation of hazardous materials from non-hazardous materials eliminates the potential for cross-contamination of agricultural amendments and exposure of workers to hazardous fumes or residues.

4.10 Standard Condition #10. Cultivation-Related Wastes

- a) *Cultivation-related wastes including, but not limited to, empty soil/soil amendment/fertilizer/pesticide bags and containers, empty plant pots or containers, dead or harvested plant waste, and spent growth medium shall, for as long as they remain on the site, be stored at locations where they will not enter or be blown into surface waters, and in a manner that ensures that residues and pollutants within those materials do not migrate or leach into surface water or groundwater.*

Meets condition? Unknown

Observations/Comments: The Project Site contained many above-ground, uncovered planting pots containing potting soil and soil amendments in the cultivation areas (CA #1 and CA #2). It is unknown if these pots and the spent soils are removed, covered or adequately cover-cropped during the wet season to prevent runoff or nutrient leaching. Similarly, it is unknown how spent soils are addressed (removed, piled, discarded, recycled, or disposed of at the end of each growing season.

Photos: Photos 5, 14

Corrective or remedial actions needed: Tarp or otherwise cover spent plant stalks, root balls, soil bags, and soil piles during the wet season to prevent soil from being transported to surface waters or leaching nutrients into the groundwater. Remove and store indoors, or tarp or otherwise cover, all new or spent soil in piles, pots or beds during the wet season to prevent soil and nutrients from being transported to surface waters or leaching nutrients into the groundwater. Alternately, spent soils may be heavily cover cropped to tie up nutrients during the wet season, but if the dense cover crop cannot be maintained due to cold weather or snow, then the soil materials must be tarped and fully protected from the weather.

Standard Condition #10 – General comments and recommendations: We encourage you to chip or shred your plant stalks and compost them after harvest. Other cultivation-related waste can be easily contained by keeping soils and garbage greater than 200 feet from drainage areas and on gentle slopes, tarping or otherwise covering soil piles, and/or by placing straw waddles or other containment structures around the perimeter of spoil piles.

4.11 Standard Condition #11. Refuse and Human Waste

- a) *Disposal of domestic sewage shall meet applicable County health standards, local agency management plans and ordinances, and/or the Regional Water Board's Onsite Wastewater Treatment System (OWTS) policy, and shall not represent a threat to surface water or groundwater.*

Meets condition? No

Observations/Comments: The site is temporarily served by a portable toilet.

Photos: None

Corrective or remedial actions needed: The Order requires a County permitted or approved OWTS that meets County health standards. PWA recommends you work with a professional to start the permit process to site, design and install a permitted septic system through Humboldt County's Department of Environmental Health. Until a OWTS (septic system) is designed and permitted, your workers, non-residents and visitors may continue to use one or more portable toilets that are regularly and professionally serviced.

- b) *Refuse and garbage shall be stored in a location and manner that prevents its discharge to receiving waters and prevents any leachate or contact water from entering or percolating to receiving waters.*

Meets condition? Yes

Observations/Comments: PWA found no uncontained refuse or garbage during the site inspections.

Photos: None

Corrective or remedial actions needed: Collect all garbage and refuse not already stored properly in cans or the box and store in a location and manner that prevents any contact with surface or groundwater. Additionally, it is important to utilize storage facilities which prevent animals from accessing or disturbing garbage or refuse.

- c) *Garbage and refuse shall be disposed of at an appropriate waste disposal location.*

Meets condition? Yes

Observations/Comments: The operator periodically hauls refuse offsite and disposes of it at a permitted waste disposal facility.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #11 – General comments and recommendations. None

4.12 Standard Condition #12. Remediation/Cleanup/Restoration

- a) *Remediation/cleanup/restoration activities may include, but are not limited to, removal of fill from watercourses, stream restoration, riparian vegetation planting and maintenance, soil stabilization, erosion control, upgrading stream crossings, road outcropping and rolling dip installation where safe and suitable, installing ditch relief culverts and overside drains, removing berms, stabilizing unstable areas, reshaping cutbanks, and rockering native-surfaced roads. Restoration and cleanup conditions and provisions generally apply to Tier 3 sites, however owners/operators of Tier 1 or 2 sites may identify or propose water*

resource improvement or enhancement projects such as stream restoration or riparian planting with native vegetation and for such projects, these conditions apply similarly.

Appendix A accompanying the NCRWQCB Order, (and Appendix A in your WRPP), includes environmental protection and mitigation measures that apply to cleanup activities such as: temporal limitations on construction; limitations on earthmoving and construction equipment; guidelines for removal of plants and revegetation; conditions for erosion control, limitations on work in streams, riparian and wetland areas; and other measures.

These protection and mitigation measures have been developed to prevent or reduce the environmental impacts and represent minimum, enforceable standards by which cleanup activities shall be conducted under this Order.

Meets condition? Yes

Observations/Comments: No evidence of a threat to water quality was observed during the two site visits.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #12 – General comments and recommendations: All corrective and remedial actions needed to satisfy the other 11 Standard Conditions have been outlined above.

5.0 PRIORITIZED CORRECTIVE ACTIONS AND SCHEDULE TO REACH FULL COMPLIANCE

The following check list should be followed to become fully compliant with the Order. Please see the detailed comments and recommendations above for a more complete description of the problems and the needed corrective actions and monitoring requirements.

Standard Condition Requiring Action	Treatment Priority	Schedule	Corrective Action/Recommendation (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Date Completed
3 – Riparian and Wetland Protection	3a, c, d	High	May 1, 2019	MP #1, Photo 4; MP #2, Photo 11	
	3b	Moderate-High	Before Nov. 1, 2019		
4 – Spoils Management	4a, b, c	Moderate	Concurrent with any maintenance work at the spring	MP #3, Photo 6	

Standard Condition Requiring Action		Treatment Priority	Schedule	Corrective Action/Recommendation (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Date Completed
5 – Water Use	5a	High	Jan. 1, 2019 and continuing March 1, 2019 - Rebuild the POD with a permanent spring box	<ul style="list-style-type: none"> - Refine the Preliminary Water Budget and the required preliminary water storage estimate using detailed water monitoring and employing water meters on your water diversion and keep accurate records for any continuing water truck deliveries. - Under the Order, you are required to measure, document and report the water you divert (and truck), store and use throughout the year for both commercial and domestic uses. PWA has created a simple log sheet to help you monitor this water data for your Project Site (Appendix D). - Rebuild the POD with a permanent spring box so as to minimize annual maintenance disturbance. - Investigate the feasibility of constructing a permitted off-stream, rainwater fed pond(s) for providing irrigation waters for your operations, rather than using multiple water bladders. 	MP #4, Photos 7-8	
	5a	High	Beginning in 2019 and completed on or before Nov. 1, 2020	<ul style="list-style-type: none"> - Add an estimated 76,000 gallons of additional onsite water storage to meet the irrigation needs as projected in the preliminary Water Budget. 		
	5b	Moderate	Beginning March 1, 2019 and continuing	Additional water conservation measures should be investigated and employed as needed, such as: 1) the use of cover crops during rotations and winter; 2) the use of compost and mulch fertilizer to increase its water-holding capacity; 3) the use of water retaining soil mediums and native soil at the start of the season to better retain moisture; and 4) planting in-ground and not in above-ground pots so as to limit evaporative losses.	Photo 9	
	5c	High	Investigate pond construction by June 1, 2019 Engineered containment berms built concurrent	<ul style="list-style-type: none"> - PWA recommends you investigate the feasibility of constructing a rainwater-fed, off-stream pond instead of using water bladders, which are more prone to failure. - If large water bladders are to be used, they should be sited on a flat bench, secured so they cannot move downslope, and surrounded by engineered containment berms capable of containing the stored water in the event of a bladder failure. - Water bladders should be emptied during the off season and filled in the late winter or spring, preferably using rainwater capture methods. 	Photos 9-12	

Standard Condition Requiring Action	Treatment Priority	Schedule	Corrective Action/Recommendation (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Date Completed
		with bladder installation			
	5d	Moderate	April 1, 2019 and continuing	Photos 13-14	
	5e	High	<p>SDU & SIU water rights applications filed by or before March 1, 2019</p> <p>File water data annually with NCRWQCB by March 15 and with SWRCB by June 20.</p> <p>File LSAA notification by or before March 1, 2019</p> <p>- To verify compliance and further refine water use efficiency, start measuring and recording your average water usage on a per plant basis, based on type and size of plant pot, full term versus short season (light deprivation) plant, and type of irrigation.</p> <p>- Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration is avoided.</p> <p>- Water diversion and water storage requires valid water rights documentation. As opposed to employing one or more surface water diversions and securing various water rights, consider obtaining irrigation water for your agricultural needs by developing rainwater capture systems to fill rigid water tanks and/or one or more off-stream, rainwater-fed ponds, or drilling a well.</p> <p>- Domestic water rights: If you plan to continue flow diversions for your domestic water needs, you will need to file, obtain, and maintain water rights for your parcel. File an Initial Statement of Diversion and Use (ISDU, see below) and apply for the Small Domestic Use Appropriation (SDU) for the stream diversion to cover your domestic use requirements such as drinking, bathing, cooking and fire control. (See Section 4.5e, above). The SDU water right cannot be used for commercial cannabis irrigation water.</p> <p>- Agricultural (cannabis) water rights: If you plan to continue flow diversions for your cannabis water needs, you need to file and obtain water rights from the State Water Resources Control Board, Division of Water Rights (SWRCB, DWR) using their Small Irrigation Use (SIU) water right registration program for commercial cannabis cultivation. PWA recommends that you apply for this Small Irrigation Use water right for cannabis cultivators. (See Section 4.5e, above).</p> <p>- You will need to submit annual water diversion and use volumes to the NCRWQCB by each March 31 for the preceding calendar year, and to the State Water Resources Control Board, Division of Water Rights (SWRCB, DWR) for supplemental reporting.</p>	Photo 15	

Standard Condition Requiring Action	Treatment Priority	Schedule	Corrective Action/Recommendation (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Date Completed
			required for the Annual Statement of Diversion and Use (ISDU) by June 30 of each year. - Fish and Wildlife impacts: If you are directly diverting water from a jurisdictional spring or stream, pumping water from a hydrologically connected well, capturing surface water in a pond, or modifying any stream crossings or channel works on the Project Site you will need to obtain a consultation with California Department of Fish and Wildlife (CDFW) and file the notification for a CDFW Lake and Streambed Alteration Agreement (LSAA) (See Section 4.5e, above).		
7 – Fertilizers and Soil Amendments	7a	High	Dec. 1, 2018 and annually by Oct. 31 thereafter - Bulk or bagged potting soils, soil amendments and fertilizers shall be stored within a water tight building or covered area not exposed to the elements or, if stored outdoors, fully tarped and off the ground in a stable location with no chance of runoff to surface waters or nutrient leaching or delivery to groundwater.	Photo 16	
	7b	High	Jan. 1, 2018 and continuing - To verify compliance with this condition, you are required by the Order to keep detailed records of the type, timing and volume of any fertilizers and/or other soil amendments you use in your operations. They can be recorded on log sheets such as those provided in Appendix E. - Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration of water and nutrients is avoided.		
	7c	Moderate-High	Dec. 1, 2018 and annually by Oct. 31 thereafter - To prevent nutrient leaching, either: 1) plant dense cover crops in spent pots, holes and beds to enrich soil and lock up nutrients; 2) fully tarp any piles of exposed soils and growing mediums during the winter season; and/or 3) move spent soils and amendments inside or under a roof to temporarily store them during the wet season (November 1 – May 15). - If dense cover crops cannot be kept alive, all planted areas should be tarped to protect them from rainfall, snowmelt and subsequent infiltration and leaching of nutrients. - Unused soil amendments, potting soils, compost and fertilizers should be stored under a roof or fully tarped during the wet season such that they are protected from the elements. - To confirm compliance with this Standard Condition, provide winter time (wet season) photos of the cultivation areas showing		

Standard Condition Requiring Action	Treatment Priority	Schedule	Corrective Action/Recommendation (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Date Completed
			treatments and include them with the WRPP, Appendix B (Monitoring and Reporting).		
8 – Pesticides/ Herbicides	8a	High	By or before Dec. 1, 2018 and annually by Oct. 31 thereafter - Under the Order you are required to keep records (logs) of the type, timing and volume of pesticides and herbicides used in your operations. This can be done using a simple log form, such as the one included in Appendix F. - When present, pesticides and herbicides should be stored within enclosed buildings in such a way they cannot enter or be released into surface or ground waters.		
9- Petroleum Products	9a	High	Dec. 1, 2018 and then continuing - Continue to place all small fuel cans, generators, diesel tanks, gasoline powered garden equipment and any other items containing petroleum products under cover, off the ground and in a secondary containment basin (tote, tub, impermeable basin/floor, etc.) capable of containing the entire stored volume, and in a safe, secure location (e.g. away from slopes and outside of riparian buffers). - Petroleum products and other liquid chemicals should not be stored with any ammonium nitrate-based fertilizers, soil amendments, compost, and other chemicals as they may be hazardous or incompatible.	MP #5; Photos 17-19	
	9b	High	Dec. 1, 2019 and then continuing Make sure the secondary containment basins are sufficient for the volume of fuel stored at each location. PWA recommends you build more permanent structures to cover your gas powered equipment so they (and the containment basins) remain covered and dry during windy conditions.	MP #5; Photos 17-19	
	9d	Moderate	Dec. 31, 2018 Obtain one or more spill prevention cleanup kits and keep readily available to clean up small spills. Spill kits should be located where fuel is stored and where refueling occurs.	MP #5; Photo 17	
10 – Cultivation-Related Wastes	10a	Moderate	Dec. 1, 2018 and annually by Oct. 31 thereafter - Tarp or otherwise cover spent plant stalks, root balls, soil bags, and soil piles during the wet season to prevent soil from being transported to surface waters or leaching nutrients into the groundwater. - Remove and store indoors, or tarp or otherwise cover, all new or spent soil in piles, pots or beds during the wet season to prevent soil and nutrients from being transported to surface waters or leaching nutrients into the groundwater.	Photo 5; Photo 14	

Standard Condition Requiring Action		Treatment Priority	Schedule	Corrective Action/Recommendation (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Date Completed
				- Alternately, spent soils may be heavily cover cropped to tie up nutrients during the wet season, but if the dense cover crop cannot be maintained due to cold weather or snow, then the soil materials must be tarped and fully protected from the weather.		
I 1 -- Refuse and Human Waste	I 1a		Dec. 31, 2020	- The Order requires a County permitted or approved OWTS that meets County health standards. PWA recommends you work with a professional to start the permit process to site, design and install a permitted septic system through Humboldt County's Department of Environmental Health. - Until your OWTS (septic system) is designed and permitted, your workers, non-residents and visitors may continue to use one or more portable toilets that are regularly and professionally serviced.		

6.0 MONITORING AND INSPECTION PLAN

Under the Order, sites are required to be monitored and inspected periodically to ensure conformance with the 12 Standard Conditions. In most cases, inspections and records of inspections identify conditions that have been corrected and are now in compliance; conditions that remain in compliance; and conditions that have changed and may no longer be in compliance with the Order. An inspection and monitoring plan is used to document these conditions, identify problems and make corrections using best management practices (BMPs) to protect water quality (Appendix A).

Monitoring Plan – Please refer to Appendix B and Figure 2 to review the monitoring plan and specific monitoring points for which you are responsible.

Monitoring guidelines and reporting standards have been created by the NCRWQCB as part of the Order. Monitoring of the Project Site includes visual inspection and photographic documentation of each feature of interest listed on the Project Site map, with new photographic documentation recorded with any notable changes to the feature of interest.

Site inspection schedule - According to the NCRWQCB, periodic inspections should include visual inspection of the site, including any management measures/practices, to ensure they are being implemented correctly and are functioning as expected. Inspections include photographic documentation of any controllable sediment discharge sites, as identified on the site map, and a visual inspection of those locations on the site where pollutants or wastes, if uncontained, could be transported into receiving waters, and those locations where runoff from roads or developed areas drains into or towards surface water.

At a minimum, sites shall be inspected at the following times to ensure timely identification of changed site conditions and to determine whether implementation of additional management measures is necessary to prevent or minimize discharges of waste or pollutants to surface water:

- 1) Before and after any significant alteration or upgrade to a given stream crossing, road segment, or other controllable sediment discharge site. Inspection should include photographic documentation, with photo records to be kept onsite.
- 2) Prior to October 15th to evaluate site preparedness for storm events and stormwater runoff.
- 3) Following the accumulation of 3 inches cumulative precipitation (starting September 1st) or by December 15th, whichever is sooner.
- 4) Following any rainfall event with an intensity of 3 inches precipitation in 24 hours. Precipitation data can be obtained from the National Weather Service by entering the site zip code at <http://www.srh.noaa.gov/forecast>; Pick the nearest or most relevant zip code and then select the 3 day history that will also show precipitation totals.

Inspection and Monitoring Checklist – Appendix B contains a checklist data form that will be used by the landowner and/or operator to: 1) document inspection dates, 2) document visual and photographic inspection results, 3) describe remediation and management measures that are being applied, 4) identify new problems and their treatments, and 5) document the progress and effectiveness of implementing remedial and corrective measures that are needed to meet the 12 Standard Conditions, as outlined in this WRPP. Appendix C contains photo documentation of your

monitoring points and will need to be updated as corrective treatments are implemented and treatments are monitored and evaluated over time.

Annual Reporting – An Annual Report is to be submitted directly to the NCRWQCB or to PWA (through our 3rd Party Program). The information in the annual reporting form must be submitted by March 31st of each year. The reported information is to be reflective of current site conditions, and includes monitoring data and tasks accomplished to protect water quality. Among other things, the report includes such items as the reporting of monthly monitoring data collected during the year (e.g., chemical use, water diversions, water storage, water use, etc.), management measures (BMPs) applied during the year and their effectiveness, and tasks accomplished during the year towards meeting each of the 12 Standard Conditions identified as deficient in this WRPP.

7.0 WATER USE PLAN

Requirements - According to the Order, a Water Use Plan (WUP) shall record water source, relevant water right documentation, and amount used monthly. All water sources shall be recorded, including alternative sources such as rain catchment and groundwater, and/or hauled water. Other elements of the WUP will include:

- Developing a Water Budget for determining the timing and volume of actual water use on the site. Water related data will be summarized monthly for the preceding month.
- Designing and implementing water conservation measures to reduce water diversion and water use.
- Calculating water storage requirements needed to support cultivation activities during the dry season, and implementing those required storage measures.

The Water Use Plan must also describe water conservation measures and document your approach to ensure that the quantity and timing of water use is not impacting water quality objectives and beneficial uses (including cumulative impacts based on other operations using water in the same watershed). Water use will only be presumed to not adversely impact water quality under one of the following scenarios:

- No surface water diversions occur from May 15th to October 31st.
- Water diversions are made pursuant to a local plan that is protective of instream beneficial uses.
- Other options that may affect water quality: (e.g., percent of flow present in stream; minimum allowable riffle depth; streamflow gage at bottom of Class I stream; AB2121 equations; CDFW instream flow recommendations; promulgated flow objective in Basin Plan; etc.).

Site Water Use Plan -The record of activities, accomplishments and water monitoring results for the Water Use Plan for this site will be logged and recorded in data tables and site records (data forms) included in Appendix D of this WRPP. These will be tracked and kept up-to-date by the landowner or cultivator of the site.

Water Storage and Forbearance - The ultimate goal of the applicant is to accumulate enough water storage capacity to forebear the entire period from May 15 to October 31 each year. As

described under the Order, this will ensure the timing of water use is not impacting water quality objectives and beneficial uses. The low gradient setting of this Project Site provides several stable locations where additional water tanks may be safely placed if needed.

Water Conservation - Water conservation measures currently practiced include drip irrigation and watering late in the afternoon or evening to minimize water loss through evaporation and maximize water up-take by the plants. New water conserving techniques and equipment should be utilized and tested to evaluate their effectiveness and efficiency. These should include: 1) the use of cover crops; 2) the use of compost and mulch fertilizer to improve water-holding capacity; 3) the use of water retaining soil mediums and native soil during initial soil preparation at the start of the season; and 4) planting in-ground and not in above-ground pots to limit evaporative losses. PWA further recommends increasing rainwater harvesting activities and adding rainwater-fed storage facilities sufficient to meet dry season irrigation needs. You should investigate the feasibility of developing an off-stream pond that can be filled through rainwater harvesting.

Water sources and use - The only source of water used for irrigation is from a spring (Spring #1) identified in Figure 2. Water flows via gravity to a 1,500 gallon settling tank and then flows into four 2,500 gallon tanks located between the cultivation areas (Figure 2). The pumps are equipped with a flow totalizer and the operators are maintaining water use records.

Approximately 9,000 square feet of cultivation area was located on the Project Site, and 14,000 gallons of rigid tank water storage. At an estimated average of 10 gal/ft²/year for the cannabis growing season (estimated water consumption rate based on Humboldt County Planning and Building Department data, and data collected by PWA), the operator would require approximately 90,000 gallons of water storage to supply current operations during the forbearance period from May 15 to October 31 each year. If forbearance is required, 76,000 gallons of additional water storage capacity would be required to supply sufficient irrigation water for 9,000 ft² of cannabis cultivation during the forbearance period from May 15 to October 31.

The operator proposes to expand the cultivation area to one-half acre (21,780 ft²). This would increase needed water storage to a total of 217,800 gallons (proposed area x 10 gal/ft²) for the 0.5 acres (21,780 ft²) of cultivation. The operator is proposing to install four (approximately) 54,000 gallon rainwater tanks, increasing the water storage capacity to 230,000 gallons.

It will be important over the course of the season to keep accurate water diversion, storage and use records so that they can be reported at the end of each year. Water use can be documented using the log forms supplied by PWA, attached in Appendix D. The more frequently and accurately water use is recorded, the better you can understand the water needs for your business. Annual reporting of diversion and use rates is required to be submitted annually to the North Coast Regional Water Quality Control Board (NCRWQCB) by May 15 and to the State Water Resource Control Board (Division of Water Rights) by June 30 for the previous calendar year. As more accurate data is gathered, refined targets can be made to ensure adequate storage exists to protect downstream water quality and beneficial uses during the driest time of the year.

8.0 LIST OF CHEMICALS

The WRPP must contain a list of chemicals being stored onsite, in addition to quantities used and frequency of application. These include fertilizers/soil amendments, pesticides, herbicides, fungicides, petroleum products and other chemicals used in, or associated with, your cultivation activities and related operations.

Information regarding chemical use and storage is deficient or anecdotal. Appendixes E and F contain monitoring forms that should be used to list the chemical inventory record over time, as supplies are added to the site and used during the growing season. The landowner or operator will use these forms to track the types, storage volumes, timing of application, and volume of use of these products throughout the year. The initial chemicals and amendment list that may be used and stored onsite include:

<u>Fertilizers and amendments: (lb)</u>	<u>Pesticides, Herbicides, and Fungicides:</u>
Rainbow Mix Grow 1600	None
Trace Mineral (Azomite) 50	
AG Lime 50	<u>Petroleum and Other Chemicals:</u>
Rainbow Mix Bloom 800	Gasoline
Grow More 50	Propane

9.0 LANDOWNER/LESSEE CERTIFICATION/SIGNATURES

This Water Resource Protection Plan (WRPP) has been prepared by Pacific Watershed Associates, an approved Third Party Program acting on behalf of the North Coast Regional Water Quality Control Board (NCRWQCB).

"I have read and understand this WRPP, including Section 2.0 – Certifications, Conditions and Limitations. I agree to comply with the requirements of the California Regional Water Quality Control Board North Coast Region Order No. 2015-0023 (Waiver of Waste Discharge Requirements and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects in the North Coast Region), including the recommendations and actions listed in this WRPP."

Name of Legally Responsible Person (LRP): Brian Swields
Title (owner, lessee, operator, etc.): Operator
Signature: [Signature] Date: 12/11/18

WRPP prepared by (if different from LRP): **Pacific Watershed Associates, Inc.**

WRPP prepared and finalized on (date): 12/11/18
Signature: Courtney Sundberg Date: 12/11/18

Appendix A

Best Management Practices for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects

Appendix B

Monitoring Plan and Photo Log



APPENDIX B: MONITORING PLAN AND PHOTO LOGS

Monitoring Plan – In general, the entire road network, cultivation area and associated facilities need to be monitored throughout the year to identify any problems that might arise and to monitor the effectiveness of corrective actions (Table 1) when completed. Refer to Figure 2 for the specific locations of monitoring points that you are responsible for tracking. Regardless, the entire project site needs to be regularly inspected and monitored to ensure that the site achieves and maintains compliance with the 12 Standard Conditions. If additional deficiencies develop, or individual problems arise, then corrective actions must be implemented immediately and these problem areas will need to be further monitored according to the WRPP.

For this project site, five (5) monitoring points have been designated. Monitoring Point (MP) #1 has been established to monitor that part of CA #1 that is within the 50 ft riparian buffer of a wetland. MP #2 shows a 1,500 gallon water tank within 50 ft of the Class III watercourse below spring #1 that also needs to be relocated outside the buffer. MP #3 shows the spoils near spring #1 POD that need to be removed. MP #4 is Spring #1 POD that needs a permanent spring box to reduce annual maintenance disturbances and MP #5 depicts the gas powered pumps that have small secondary containment and temporary tarp/plywood covers.

The goal of the monitoring on this Project Site is to ensure the original problems or non-compliant features (e.g., cultivation areas and water tanks within riparian buffers, etc.) have been effectively treated and that environmental problems or threats to water quality do not arise or are adequately mitigated during the year. Consult with PWA if a problem is detected at any of these monitoring locations or elsewhere on the property, or if you would like our assistance in monitoring or developing corrective actions (BMPs) for problems that develop. Please also report to PWA when one or more of the corrective actions in the WRPP have been implemented, and include photos and descriptions of the actions taken.

Site inspection schedule - According to the NCRWQCB, periodic inspections should include visual inspection of the site, including any management measures/practices, to ensure they are being implemented correctly and are functioning as expected. Inspections include photographic documentation of any controllable sediment discharge sites, as identified on the site map, and a visual inspection of those locations on the site where pollutants or wastes, if uncontained, could be transported into receiving waters, and those locations where runoff from roads or developed areas drains into or towards surface water.

At a minimum, sites shall be inspected at the following times to ensure timely identification of changed site conditions and to determine whether implementation of additional management measures is necessary to prevent or minimize discharges of waste or pollutants to surface water:

- 1) Before and after any significant alteration or upgrade to a given stream crossing, road segment, or other controllable sediment discharge site. Inspection should include photographic documentation, with photo records to be kept on-site.
- 2) Prior to October 15 to evaluate site preparedness for storm events and stormwater runoff.
- 3) Following the accumulation of 3 inches cumulative precipitation (starting September 1st) or by December 15th, whichever is sooner.
- 4) Following any rainfall event with an intensity of 3 inches precipitation in 24 hours. Precipitation data can be obtained from the National Weather Service by entering the site zip code at <https://hdsc.nws.noaa.gov/hdsc/pfds/> Pick the nearest or most relevant zip code and then select the 3 day history that will also show precipitation totals.

Photo Log of features of interest and monitoring points before, during, and/or after treatment

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description
1	--	Driveway	8/13/16		The site driveway looking north (towards facilities) from the intersection with Butler Valley Road.
2	--	DRC #2	7/31/18		View of DRC #2 outlet located on Butler Valley Road.
3	--	DRC #3	7/31/18		View of DRC #3 outlet located on Maple Creek Road.
4	MP #1	Riparian Buffer	7/31/18	Pre-treatment	Wetland immediately adjacent to CA#1 at plank footbridge, requiring a 50 ft riparian buffer or setback.
5	--	CA #1	7/31/18		Cultivation Area #1 sloping southwest toward fencing along Butler Valley Road. Note above-ground pots, drip irrigation system, and bare soils in and around cultivation area.
6	MP #3	Spoils	7/31/18	Pre-treatment	Spoils pile from annual POD maintenance located near Spring #1.
7	MP #4	POD	8/13/16		POD, Spring #1
8	MP #4	POD	7/31/18		POD, Spring #1
9	--	Irrigation			Drip irrigation system used in CA #1. Note straw mulch used on path around CA.
10	--	Water Storage	7/31/18		Five 2,500-gallon water storage tanks.

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description
11	MP #2	Water Storage	7/31/18		1,500-gallon settling tank near Spring #1. This water tank is located within 50 ft of the Class III watercourse below Spring #1.
12	--	Water Storage	7/31/18		2,500-gallon mix tank near trailer.
13	--	Irrigation	7/31/18		Controlled irrigation resulting in no evidence of over-watering and minimal vegetative growth near pots.
14	--	Irrigation	8/13/16		Drip irrigation system in use at Cultivation Area #2, showing above ground pots and bare soil on cultivation area pad.
15	--	Riparian	7/31/18		Seasonal ponding area southwest and down gradient of springs
16	--	Fertilizer storage	8/13/16		Fertilizer stored inside the trailer.
17	MP #5	Petroleum	7/31/18		Two gasoline-powered pumps. Note the water meter, and the <i>temporary</i> cover and secondary containment.
18	--	Petroleum	7/31/18	Pre-	View of propane power source.
19	--	Petroleum	7/31/18	--	500-gallon propane tank near shed

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description

[illegible]

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description

Appendix C

Photo Documentation of Monitoring Points



APPENDIX C: PHOTO DOCUMENTATION OF MONITORING POINTS



Photo 1 –site driveway looking north (towards facilities) from the intersection with Butler Valley Road (2016)



Photo 2 – view of DRC #2 outlet located on Butler Valley Road (2018)



Photo 3 – view of DRC #3 outlet located on Maple Creek Road (2018)



Photo 4 – Wetland adjacent to CA#1 at footbridge, MP #1 (2018)

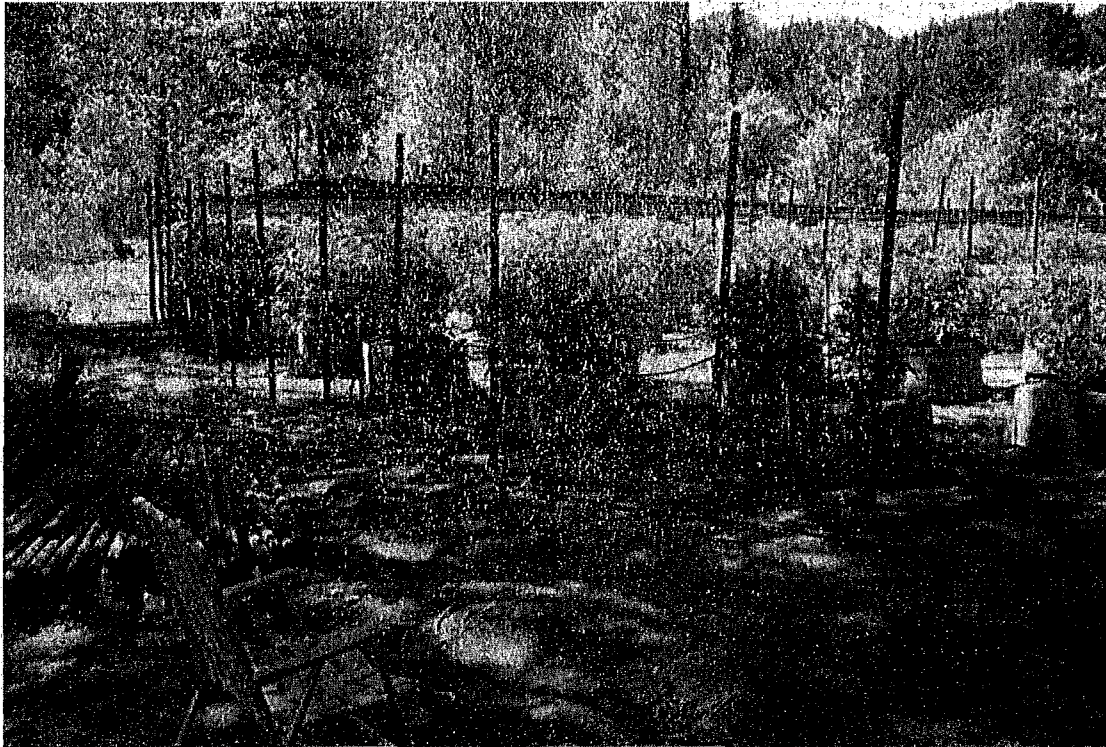


Photo 5 - Cultivation Area #1 sloping southwest toward fencing along Butler Valley Road (2016)



Photo 6 – Spoils pile near spring #1 (POD), MP #3 (2018)



Photo 7 – POD, spring #1, MP #4 (2016)



Photo 8 – POD, spring #1, MP #4 (2018)



Photo 9 – Drip irrigation system used in CA #1 (2018)

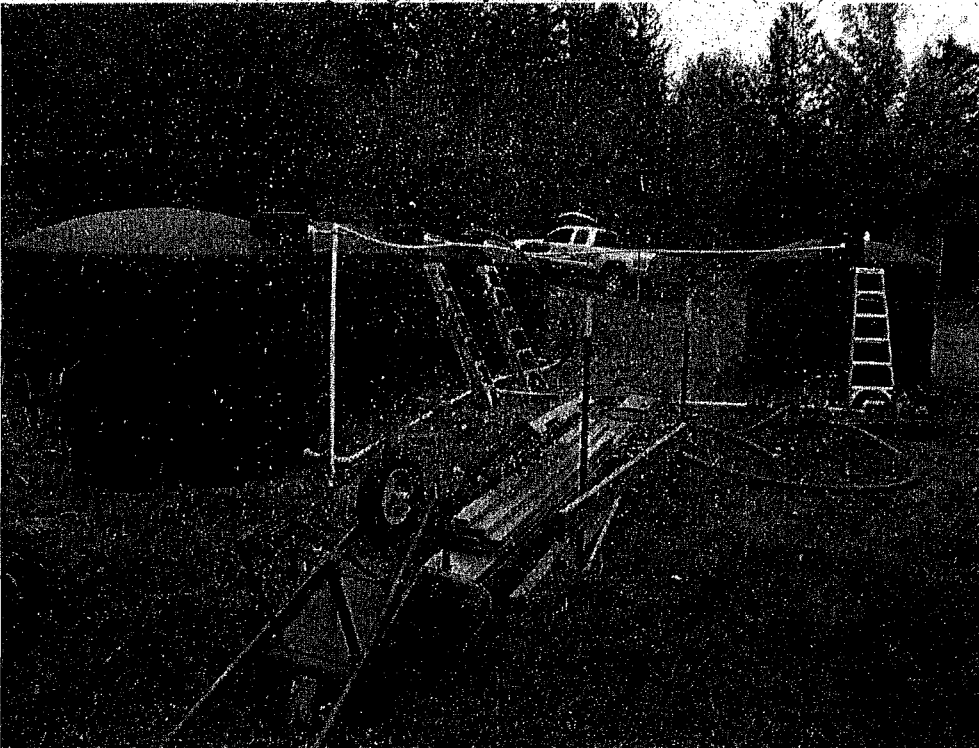


Photo 10 – Five 2,500-gallon water storage tanks (2018)



Photo 11 – 1,500-gallon settling tank near Spring #1, MP#2 (2018)



Photo 12 – 2,500-gallon mix tank near trailer (2018)



Photo 13 – Controlled irrigation resulting in no evidence of over-watering at CA#1. (2018)



Photo 14 – Drip irrigation system in use at CA #2 (2016)



Photo 15 – Seasonal ponding area southwest and down gradient of springs (2018)



Photo 16 – Fertilizer stored inside the trailer (2016)

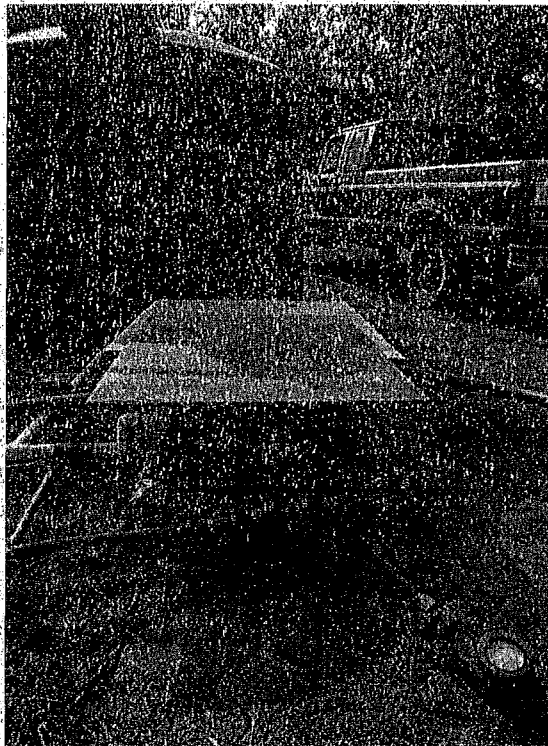


Photo 17 – Two gasoline-powered pumps used to convey spring water to storage tanks. Note the water meter, and the cover and secondary containment; MP#5. (2018)

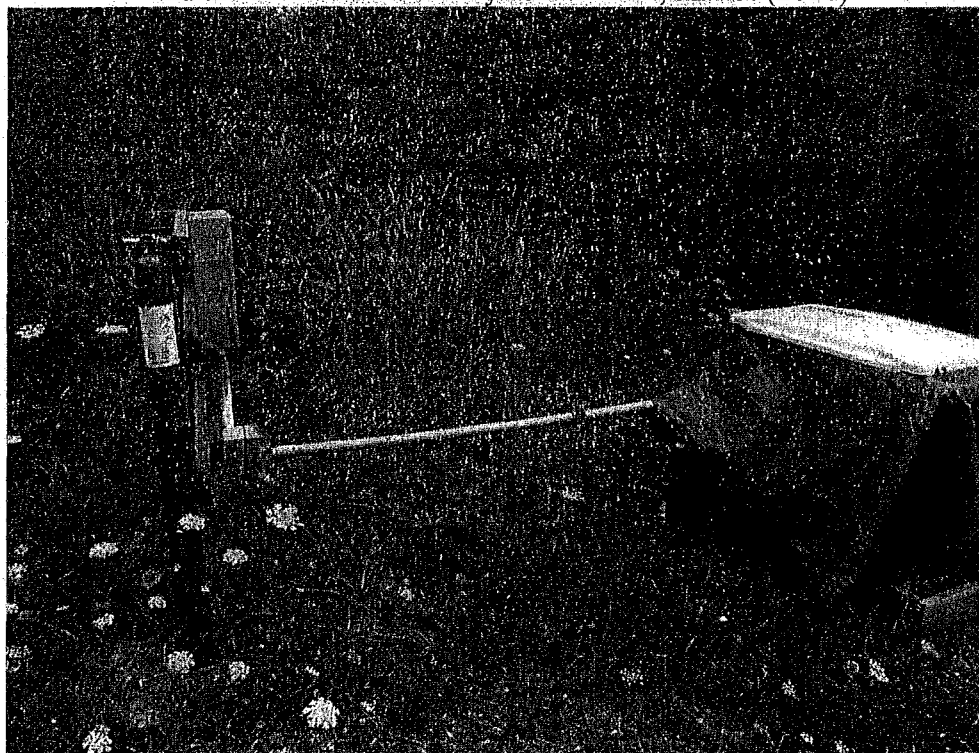


Photo 18 – Power source (2018).

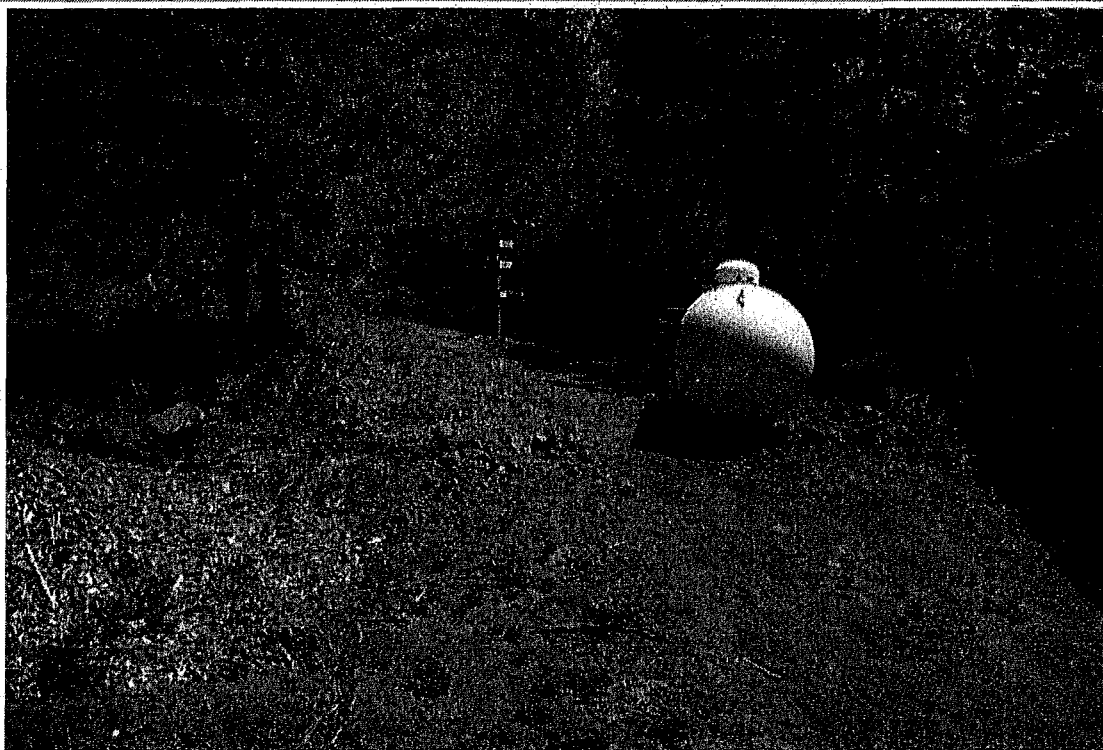


Photo 19 – 500-gallon propane tank near shed (2018)

Appendix D

PWA Water Log Sheets

Total Surface Water Diversion - Log Sheet -		WD ID:		PWA ID:		Watershed:							
		Location:						Sheet ___ of ___	Year:				
Water Diversion Source (e.g., stream, in-stream pond, spring, etc.)	Water unit (gallons or acre feet)	Amount diverted per month (gallons or acre feet)											
		January	February	March	April	May	June	July	August	September	October	November	December
Monthly Totals													
Comments:													

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Water Input to Storage - Log Sheet -		WD ID:		PWA ID:		Watershed:							
		Location:						Sheet ___ of ___	Year:				
Water Source (e.g., rainwater catchment, stream diversion, spring diversion, well, water delivery, etc.)	Water unit (gallons or acre feet)	Amount input to storage per month (gallons or acre feet), by source											
		January	February	March	April	May	June	July	August	September	October	November	December
Monthly Totals													
Comments: As per NCRWQCB: "Report water volume input to storage, listing each source separately. This may include inputs from rainfall catchment, surface water diversions													

Water Use by Source - Log Sheet -		WD ID:		PWA ID:		Watershed:							
		Location:				Sheet ___ of ___		Year:					
Water Source <i>(tank, bladder, pond, well, delivered, other)</i>	Water unit <i>(gallons or acre feet)</i>	Amount utilized from storage per month (gallons or acre feet), by type											
		January	February	March	April	May	June	July	August	Sept	October	November	December
Monthly Totals													
Comments: As per NCRWQCB: "Report water volume used, listing each source separately. This may include use of stored water, immediate use of pumped groundwater, diverted surface water, or delivered water. If water is delivered, list delivery date, delivery volume, and name and address of water purveyor"													
Prepared by Pacific Watershed Associates ♦ P.O. Box 4433 ♦ Arcata, California, 95518 ♦ Ph: (707) 839-5130 ♦ Fx: (707) 839-8168 www.pacificwatershed.com													

Appendix E

PWA Fertilizer-Amendment Log Sheets

[illegible]

Appendix F

PWA Pesticide-Herbicide Log Sheets Legal Pest Management Practices

Pesticide and Herbicide Application Log Sheet			WD ID:			PWA ID:		Watershed:	
Location:			Year:				Sheet #: _____ of _____		
Product name	Pesticide or Herbicide (circle one)	Product type (circle type)	Recommended application amount from product label (e.g. # of ounces per application)	Application units (grams, ounces, liters, gallons, etc.)	Recommended application schedule (daily, weekly, etc.)	Actual amount (in same units) used per application	Date applied (mo/day)	Initials	Comments
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							

LEGAL PEST MANAGEMENT PRACTICES FOR MARIJUANA GROWERS IN CALIFORNIA

PESTS OF MARIJUANA IN CALIFORNIA

Marijuana pests vary according to cultivar (variety), whether the plants are grown indoors or outdoors, and where the plants are grown geographically. The pests included in this review are based on two sources: a presentation given in 2013 by Whitney Cranshaw, an extension entomologist at Colorado State University, and a review article by John M. McPartland, a professor of family medicine at the University of Vermont.

HOW TO INTERPRET THE TABLES

Table 1 lists active ingredients not illegal to use on marijuana and the pests that these active ingredients target.

These active ingredients are exempt from **residue tolerance requirements**¹ and either exempt from **registration requirements**² or registered for a use that's broad enough to include use on marijuana. Residue tolerance requirements are set by U.S. EPA for each pesticide on each food crop and is the amount of pesticide residue allowed to remain in or on each treated crop with "reasonable certainty of no harm." Some pesticides are exempted from the tolerance requirement when they're found to be safe. Some of these pesticides are bacterial-based insect pathogens (e.g., *Bacillus thuringiensis*) or biofungicides (e.g., *Bacillus subtilis*, *Gliocladium virens*).

Active ingredients exempt from registration requirements are mostly food-grade essential oils such as peppermint oil or rosemary oil.

Tables 2 and 3 list pests of marijuana grown outdoors and indoors, and **Table 3** shows pests arranged by the portion of the plant they attack. An explanation of the column labels for Tables 2 and 3 follow.

PESTS. The tables show the most likely pests in California based on Cranshaw's presentation and McPartland's list and gleaned from California-based web sites and blogs. Some pests that drew attention on several blogs (e.g., hemp russet mite) may be

worse during drought years. Many have cyclic population fluctuations and others are mainstays of general greenhouse cultivation (e.g., whiteflies, thrips, and fungus gnats). We'll add weeds to this compendium when we have more information.

DAMAGE. For damage caused by greenhouse pests, we derived information from Cranshaw's presentation; for that of outdoor pests when there wasn't any overlap, McPartland's list was used and information from UC IPM for various crops. Accounts of damage by rodents is anecdotal.

IPM PRACTICES. Most of these are standard practices for pests on hosts other than marijuana. For more detailed explanations, see information compiled by the University of California Statewide IPM Program (UC IPM) at www.ipm.ucdavis.edu. You can enter a pest name in the search box (e.g., cutworm) and read about IPM practices for the pest on crops other than marijuana. For marijuana grown indoors, go to the UC IPM home page, click on [Agricultural Pests](#) and scroll down the alphabetical list until you reach [ornamental nurseries](#).

Some practices were excluded because they apply to nearly all of the pests. For example, when targeting aphids, whiteflies, and thrips, growers can attract predaceous and parasitic arthropods by planting cover crops (e.g., California buckwheat) and insectary plants—especially those in the carrot, mustard, and sunflower families.

LEGAL PESTICIDES. These are covered above in the **Table 1** description and are exempt from **residue tolerance requirements** and either exempt from **registration requirements** or registered for a use that is broad enough to include use on marijuana.

Table 4 shows marijuana pests by plant part. Not all of these pests are important, but their collective damage may affect the overall health of the plant.

REFERENCES

Cranshaw, Whitney. 2013. Challenges and opportunities for pest management of medical marijuana in Colorado. Presentation.

McPartland, J.M. 1996. *Cannabis* pests. J. Internat. Hemp Assoc. 3(2): 49, 52–55.

¹ 40 CFR (Code of Federal Regulations).

² under FIFRA section 25(b) and 3 CCR section 6147

Table 1. Active ingredients that are exempt from residue tolerance requirements^a and either exempt from registration requirements^b or registered for a use broad enough to include use on marijuana.

ACTIVE INGREDIENT	PEST OR DISEASE
azadirachtin ^a	aphids, whiteflies, fungus gnats, leafminers, cutworms
<i>Bacillus subtilis</i> QST ^{a1}	root diseases, powdery mildew
<i>Bacillus thuringiensis</i> ^{a2} subsp. <i>aizawai</i> or <i>kurstaki</i>	moth larvae (e.g., cutworms, budworms, hemp borer)
<i>Bacillus thuringiensis</i> ^{a2} subsp. <i>israelensis</i>	fly larvae (e.g., fungus gnats)
<i>Beauveria bassiana</i> ^{a3}	whiteflies, aphids, thrips
cinnamon oil ^b	whiteflies
<i>Gliricidium virens</i> ^{a1}	root diseases
horticultural oils ^a (petroleum oil)	mites, aphids, whiteflies, thrips; powdery mildew
insecticidal soaps ^a (potassium salts of fatty acids)	aphids, whiteflies, cutworms, budworms
iron phosphate ^a ; sodium ferric EDTA ^a	slugs and snails
neem oil ^a	mites, powdery mildew
potassium bicarbonate ^a ; sodium bicarbonate ^a	powdery mildew
predatory nematodes ^a	fungus gnats
rosemary + peppermint essential oils ^b	whiteflies
sulfur ^a	mites, hemp flea beetles
<i>Trichoderma harzianum</i> ^{a1}	root diseases

^a 40 CFR (Code of Federal Regulations)

^b FIFRA §25(b) and 3 CCR §6147 [FIFRA = the Federal Insecticide, Fungicide, and Rodenticide Act; CCR = California Code of Regulations]

¹ Biofungicides

² Bacterial-based insect pathogen

³ Fungal-based insect pathogen

Table 2. PEST MANAGEMENT PRACTICES FOR MARIJUANA GROWN OUTDOORS

PEST	DAMAGE	IPM PRACTICES (monitoring, cultural, physical, mechanical, biological)	PESTICIDES
MITES & INSECTS			
two-spotted spider mites <i>Tetranychus urticae</i>	Suck plant sap; stipple leaves	<ul style="list-style-type: none"> Keep dust down by hosing off plants (if dust is a problem) Release predatory mites 	neem oil, horticultural oil, sulfur
hemp russet mites <i>Aculops cannabicola</i>	Suck plant sap; kill leaves and flowers	<ul style="list-style-type: none"> Release predatory mites 	neem oil, horticultural oil, sulfur
crickets (field & house) <i>Gryllus desertus</i> , <i>G. chinensis</i> , <i>Acheta domesticus</i>	Eat seedlings	<ul style="list-style-type: none"> Use floating row covers or cones on individual plants 	—
termites	Eat roots	<ul style="list-style-type: none"> Flood nests 	—
leafhoppers	Suck plant sap; weaken plants	<ul style="list-style-type: none"> Encourage natural enemies by planting nectar sources 	horticultural oil or insecticidal soaps for nymphs
aphids <i>Phorodon cannabis</i> , <i>Myzus persicae</i> , <i>Aphis fabae</i>	Suck plant sap; weaken plants <i>P. cannabis</i> (bhang aphid) vectors tobacco mosaic virus	<ul style="list-style-type: none"> Hang up yellow sticky cards (alates) Hose off plants 	azadirachtin, horticultural oil, insecticidal soaps, <i>Beauveria bassiana</i>
whiteflies <i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i> , <i>B. argentifolii</i>	Suck plant sap; weaken plants	<ul style="list-style-type: none"> Hang up yellow sticky cards Reflective plastic mulch 	azadirachtin, horticultural oil, insecticidal soaps, rosemary + peppermint oils, <i>Beauveria bassiana</i>
leafminers <i>Liriomyza</i> spp.	Bore into roots and leaves	<ul style="list-style-type: none"> Remove older infested leaves Use biocontrol: release <i>Diglyphus</i> parasitoids 	azadirachtin

PEST		DAMAGE	IPM PRACTICES (monitoring; cultural, physical, mechanical, biological)	PESTICIDES
LEPIDOPTERA	cutworms <i>Agrotis ipsilon</i> , <i>A. segetum</i> , <i>Spodoptera litura</i> , <i>S. exigua</i> , <i>Mamestra brassicae</i> (Noctuidae)	Eat seedlings	<ul style="list-style-type: none"> Use pheromone traps to detect adults. Remove weeds, which serve as a reservoir for cutworms and other noctuids 	Vegetative stage only: Use <i>Bacillus thuringiensis kurstaki</i> if egg-laying adults found, insecticidal soap; azadirachtin
	budworms <i>Helicoverpa armigera</i> , <i>H. zea</i> (Noctuidae)	Eat flowering buds	<ul style="list-style-type: none"> Shake plants to dislodge larvae Remove infested buds Plant corn as trap crop 	Vegetative stage only: Use <i>Bacillus thuringiensis kurstaki</i> , insecticidal soap
	hemp borers (= hemp moth) <i>Grapholita delienseana</i> (Tortricidae)	Bore through stalks (caterpillars)	<ul style="list-style-type: none"> Plow crop under in fall; remove plants still standing; remove nearby hemp and hop plants Use light traps at night for monitoring Use biocontrol: <i>Trichogramma</i> 	<i>Bacillus thuringiensis kurstaki</i>
COLEOPTERA	hemp flea beetles <i>Psylliodes attenuata</i> (Chrysomelidae)	Bore into stems (grubs); feed on seedlings and leaves of larger plants (beetles)	<ul style="list-style-type: none"> Use reflective mulches Plant trap crops (e.g., radish or Chinese mustard) 	sulfur
	scarab grubs (possibly other beetles)	Bore into stems	<ul style="list-style-type: none"> Use parasitic nematodes 	—
MAMMALS				
mice (e.g., house mice)		Eat young sprouts and seeds	<ul style="list-style-type: none"> Double wrap a 3'-tall chicken wire fence around plants 	Rodenticides (see footnote below)
roof rats , <i>Rattus rattus</i> wood rats , <i>Neotoma</i> spp.		Strip bark from stems to build nests	<ul style="list-style-type: none"> Trap (minus rodenticides) Mount barn owl boxes 	
pocket gophers , <i>Thomomys</i> spp.		Tunnel through planting areas; feed on plants; gnaw on irrigation lines	<ul style="list-style-type: none"> Install underground fencing (hardware cloth or ¾" mesh poultry wire) Mount barn owl boxes 	
Columbian black-tailed deer , <i>Odocoileus hemionus columbianus</i>		Knock over plants; leave dander, droppings, and ticks behind	<ul style="list-style-type: none"> Install deer fencing 	—
black bears , <i>Ursus americana</i>		Knock over plants	<ul style="list-style-type: none"> Install electric fencing 	—

Rodenticides that are not DPR-restricted materials or federally restricted use pesticides *and* are registered for a broad enough use to include use in or around marijuana cultivation sites. If using a rodenticide always read and follow the label and check to make sure that the target rodent is listed. Second-generation anticoagulant products are DPR-restricted materials not labeled for field use and as such, should never be used in or around marijuana cultivation sites.

Table 3. PEST MANAGEMENT PRACTICES FOR MARIJUANA GROWN INDOORS
(e.g., greenhouses, sheds, and grow rooms)

PEST	DAMAGE	IPM PRACTICES (monitoring, cultural, physical, mechanical, biological)	PESTICIDES
DISEASES			
powdery mildew <i>Sphaerotheca macularis</i>	Grow on leaves as white and gray powdery patches	■ Use fans to improve air circulation	horticultural oil; neem oil; sodium bicarbonate, potassium bicarbonate; <i>Bacillus subtilis</i>
pythium root rots <i>Pythium</i> spp.	Attack root tips and worsens when plants grow in wet soil	■ Avoid hydroponic production or wet soil conditions	Incorporate biocontrol agents into root-growing media (e.g., <i>Gliocladium virens</i> , <i>Trichoderma harzianum</i> , <i>Bacillus subtilis</i>)
MITES & INSECTS			
two-spotted spider mite <i>Tetranychus urticae</i>	Suck plant sap; stipple leaves	■ Disinfest cuttings before introducing to growing area ■ Release predatory mites	neem oil, horticultural oil, sulfur
leafhoppers	Suck plant sap; weaken plants	■ Encourage natural enemies by planting nectar sources	horticultural oil or insecticidal soaps for nymphs
whiteflies <i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i> , <i>B. argentifolii</i>	Suck plant sap; weaken plants	■ Hang up yellow sticky cards ■ Use biocontrol: <i>Encarsia formosa</i>	azadirachtin, <i>Beauveria bassiana</i> , cinnamon oil, horticultural oil
thrips <i>Heliethrips haemorrhoidalis</i> , <i>Frankliniella occidentalis</i> , <i>Thrips tabaci</i>	Stipple leaves and vector viruses	■ Hang up yellow or blue sticky cards	
dark-winged fungus gnats (Diptera: Sciaridae) <i>Bradysia</i> spp.	Damage roots and stunt plant growth	■ Avoid overwatering ■ Use growing media that deters gnat development ■ Hang up yellow sticky cards ■ Use biocontrol: soil-dwelling predatory mites	<i>Bacillus thuringiensis israelensis</i> (BTI); predatory nematodes; azadirachtin soil drenches

Table 4. PESTS OF MARIJUANA BY PLANT PART

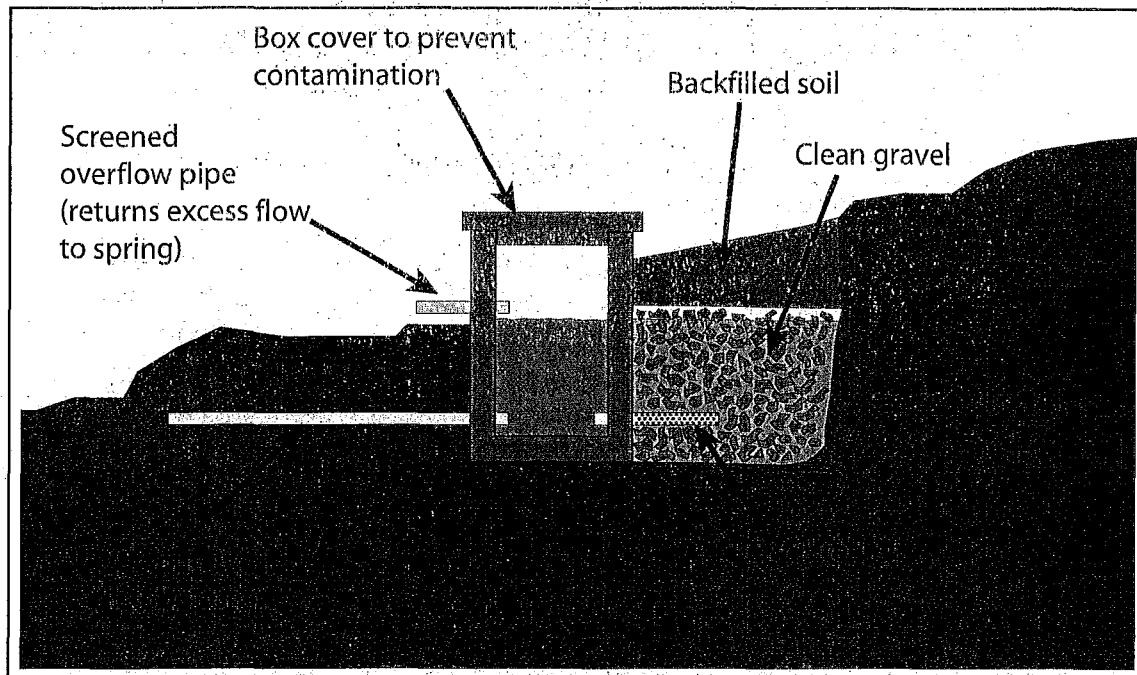
Seedlings	Flower & Leaf (grown outdoors)	Flower & Leaf (grown indoors)	Stalk & Stem	Root
cutworms	hemp flea beetle	spider mites	hemp borer	hemp flea beetle
birds	hemp borer	aphids	rats	white root grubs
hemp flea beetle	budworms	whiteflies		root maggots
crickets	leafminers	thrips		termites & ants
slugs		leafhoppers		fungus gnats
rodents				wireworms

Appendix G

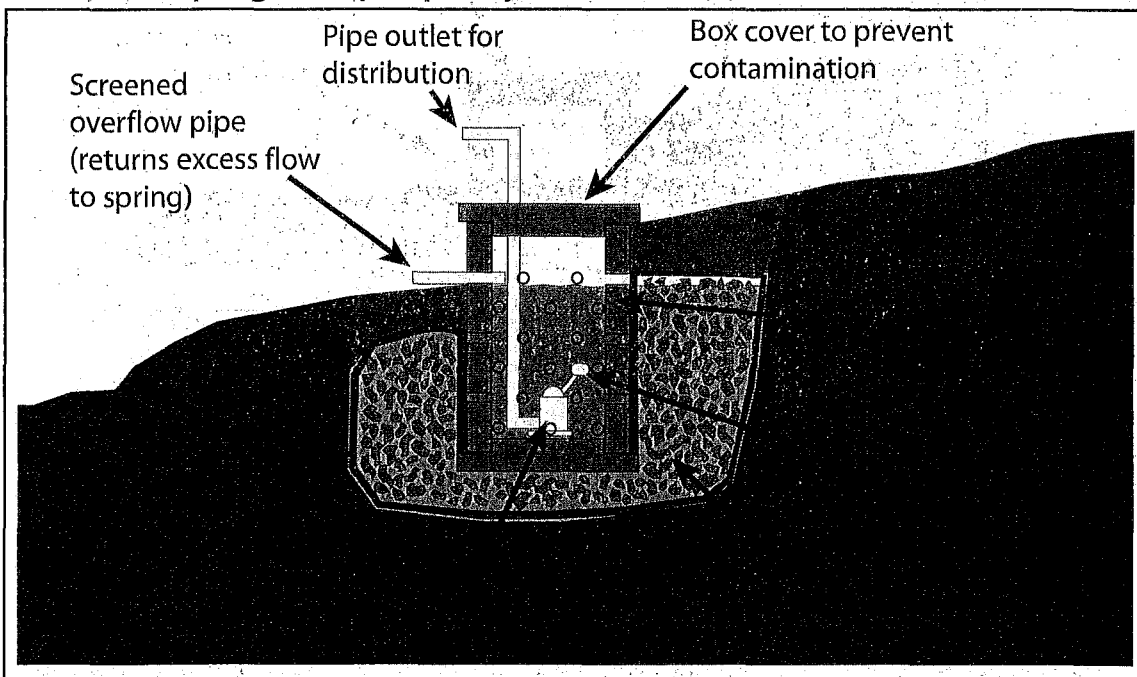
PWA Typical Drawings

Typical design drawings of spring boxes

Piped spring box - gravity system



Perforated spring box - pumped system



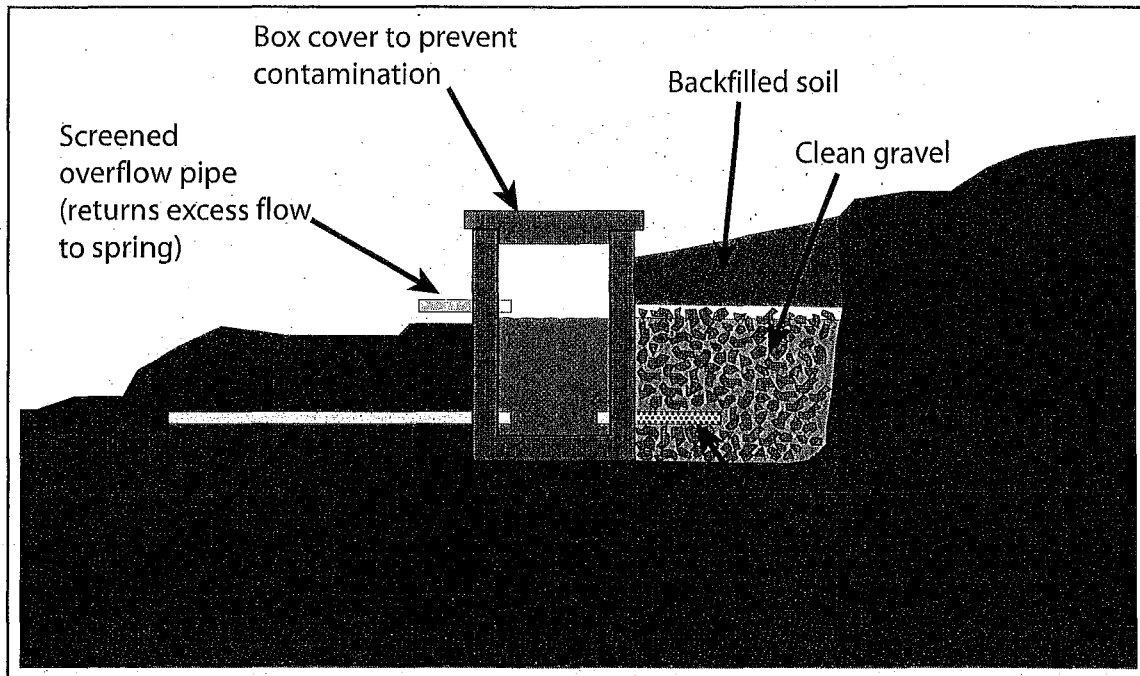
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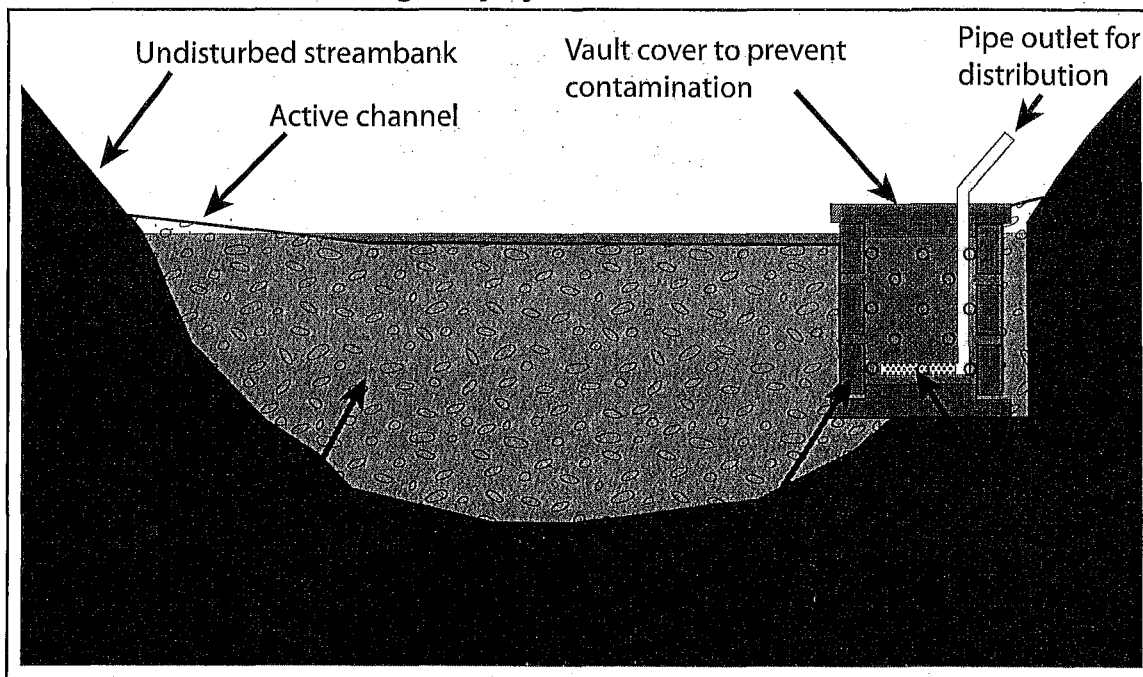
PWA Typical Drawing #20

Typical design drawings of spring box and vaulted screened intake gravity diversion infrastructure

Piped spring box - gravity system



Vaulted screened intake - gravity system



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PWA Typical Drawing #21

Appendix H

Hazardous Materials Storage Guidelines

Appendix H. Hazardous Materials Storage Guidelines

Proper storage of hazardous materials (e.g., flammable liquids or gasses, many agricultural chemicals, oxidizers, acids, caustic substances) is essential for maintaining safe operations and for protection of the environment. Commercial operations that store hazardous materials are required to prepare a Hazardous Materials Business Plan (HMBP) and maintain Material Safety Data Sheets (MSDS) for each hazardous chemical that they store or use. County health agencies may require HMBPs to be submitted for their review. The HMBP information must be communicated to employees annually and be kept in a location that is readily accessible by employees. MSDSs explain how to medically treat a person that has been exposed to a hazardous substance and how to safely cleanup a spill.

Generally, incompatible hazardous materials must be stored in separate locations, with distinct secondary containment vessels for each type of material. Secondary containment is required for hazardous liquids and must be sized to contain a spill volume equivalent to the largest hazardous material container or 10% of the total volume, whichever is greater. Flammable and combustible hazardous materials must be separated from oxidizers by a distance of no less than 20 feet. The following guidelines should be followed when handling and storing hazardous materials.

Always label containers with the substance inside for both hazardous and non-hazardous materials. For flammable hazardous materials, make certain that an appropriate fire extinguisher is available nearby the storage area. Dry powder fire extinguishers are the most versatile. Water filled fire extinguishers should not be used on certain types of hazardous material fires (e.g. water-reactive metals, strong acids, petroleum).

Acids (e.g., hydrochloric acid, pool cleaner, citric acid) must be segregated from:
Reactive metals such as sodium, potassium, magnesium, etc.
Flammable and combustible materials.
Chemicals which could generate toxic or flammable fumes when mixed.
Bases.

Bases (e.g., Portland cement, lime, lye, or drain cleaner) must be segregated from:
Acids, metals, organic peroxides and easily ignitable materials.
Solvents.
Oxidizing acids and oxidizers.

Oxidizers (e.g. ammonium nitrate, ammonium phosphate, oxygen gas) must be segregated from:
Combustible and flammable liquids and gasses (e.g. oxygen-acetylene torches) by at least 20 feet of separation.
Reducing agents such as zinc, alkali metals, and formic acid.

Flammable materials (e.g., gasoline, fuses, gunpowder, acetylene cylinders) must be segregated from:

Oxidizers, caustic materials, acids, and bases.

It is good housekeeping practice to store compatible hazardous materials exclusively away from agricultural chemicals. Although uncommon, some organic agricultural amendments may be caustic, ignitable, or corrosive. Segregation of hazardous materials from non-hazardous materials eliminates the potential for cross-contamination of materials and exposure of workers to hazardous fumes or residues.

Guidelines for proper storage of hazardous materials and regulatory oversight (California Code of Regulations Title 22) are provided by the California Department of Toxic Substances Control (DTSC). The regulations are located in Social Security, Division 4.5, Environmental Health Standards for the Management of Hazardous Waste.