

Water Resource Protection Plan (WRPP)

for

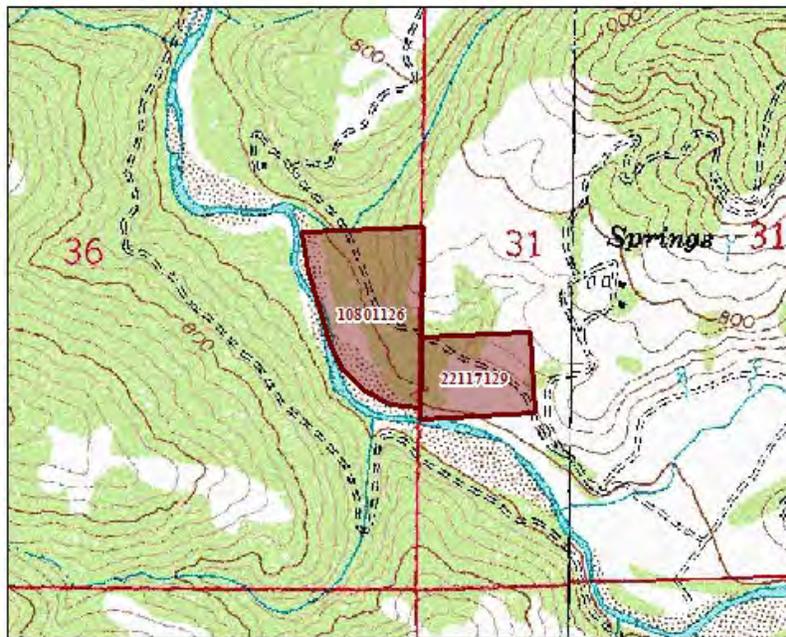
APN 221-171-029

APN 108-011-026

Located at

**140 Country Lane
Ettersburg, California**

September 2017



Prepared for:

WDID #1B16514CHUM

PWA ID#180101070203-5185

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Water Resource Protection Plan (WRPP)
APN 221-171-029
APN 108-011-026
140 Country Lane
Garberville, California

1.0 PROJECT SUMMARY

This report documents Pacific Watershed Associate's (PWA)¹ Water Resource Protection Plan (WRPP) for APNs 221-171-029 & 108-011-026 located off Country Lane, Ettersburg, CA, as shown on Figure 1. This property is located approximately 1.2 miles northwest of Ettersburg, 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 April 5, 2016, and August 3, 2017 initially by PWA restoration specialist Chris Moore, and later by PWA scientist Greyson Adams and PWA geologist Jack Skeahan respectively. After the initial reconnaissance level investigation of the property was conducted and the condition of the property noted, the follow up investigation took place the following year.

2.0 CERTIFICATIONS, LIMITATIONS AND CONDITIONS

This WRPP has been prepared by, or under the responsible charge of, a California licensed professional geologist or engineer 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 WRPP 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.

Prepared by:

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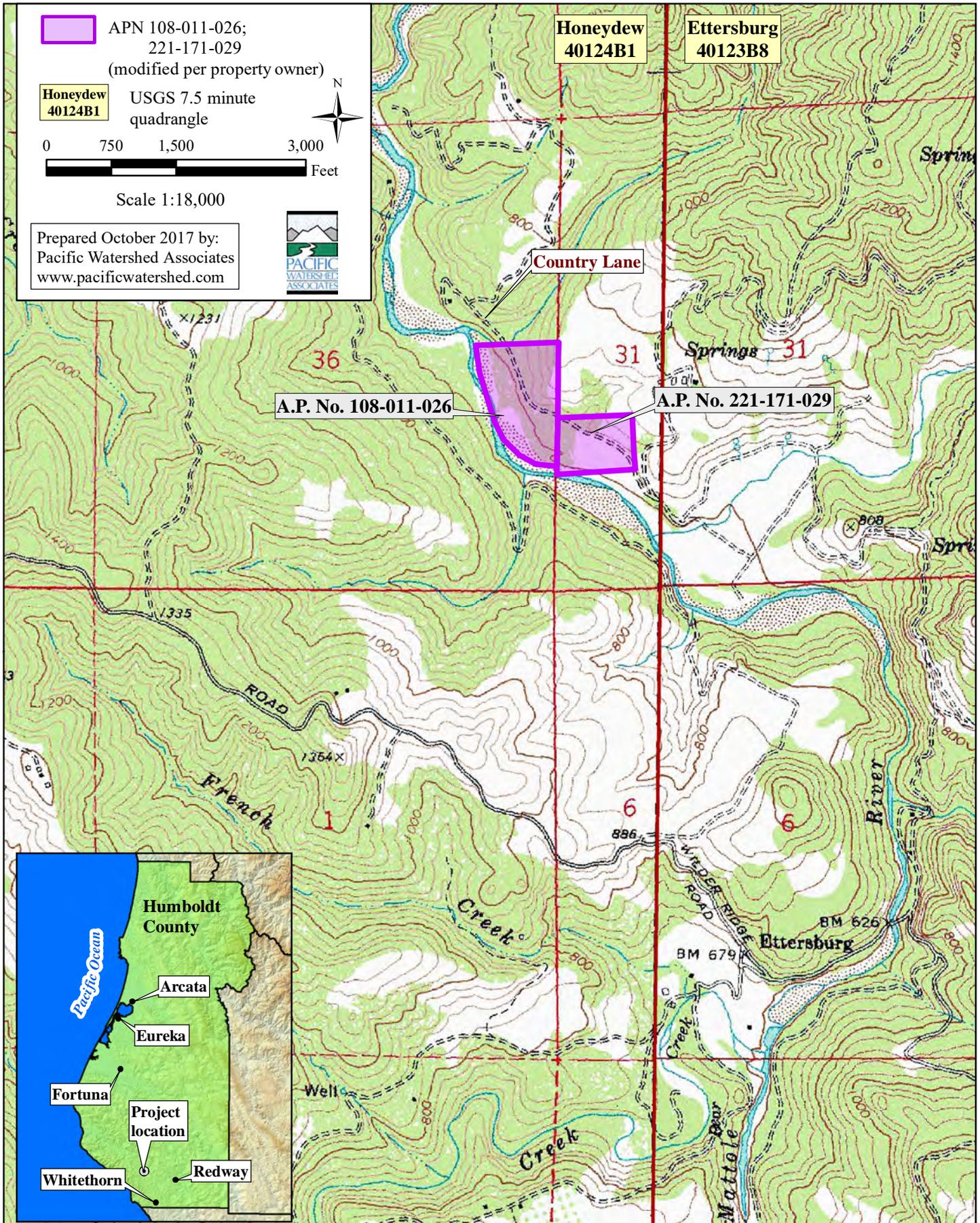


Figure 1. Location map for WDID #1B16514CHUM, APN 108-011-026 and 221-171-029 located off Country Lane, Ettersburg, Humboldt County, California.

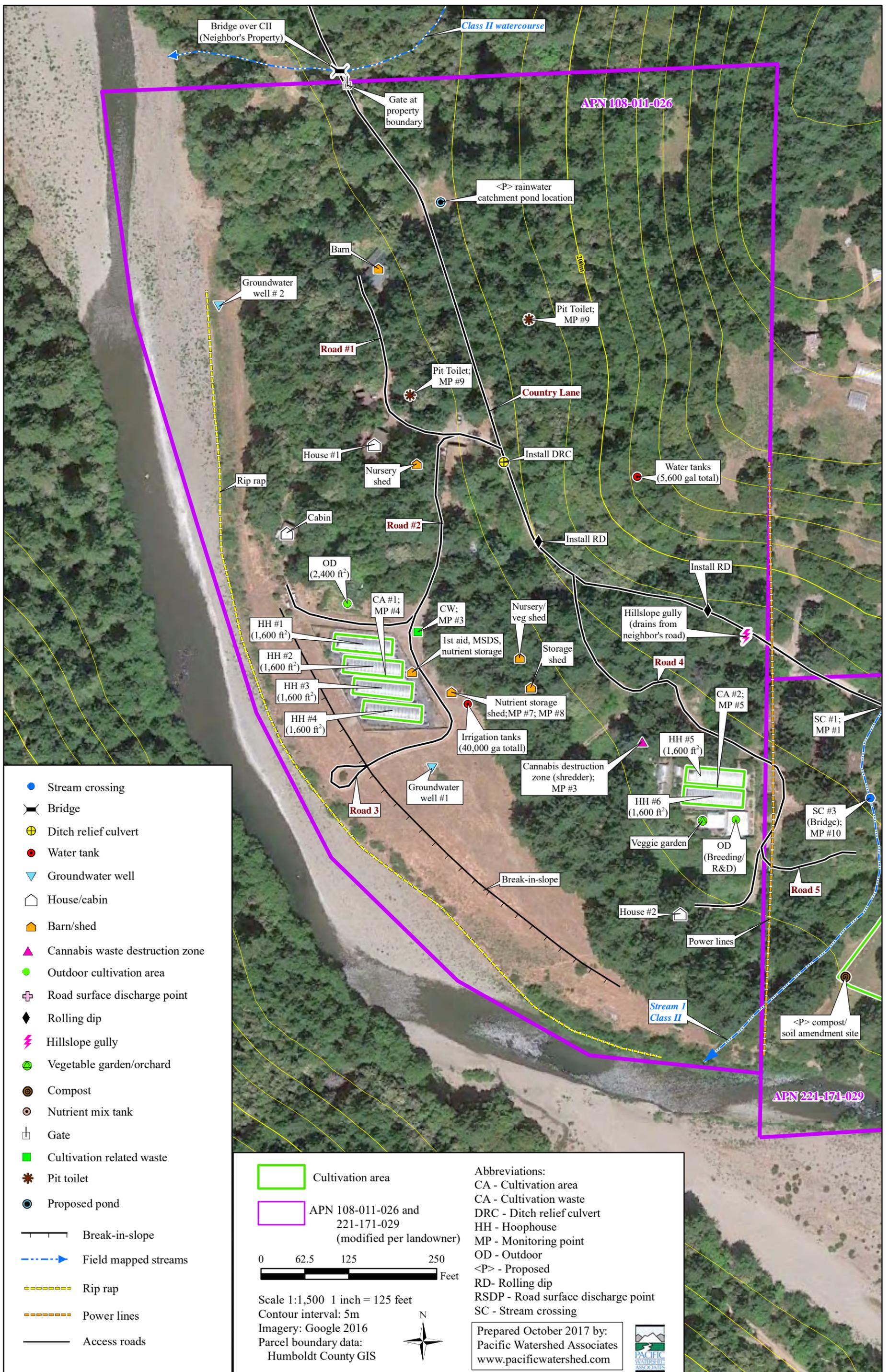


Figure 2A. Site map for WDID #1B16514CHUM, APN 108-011-026 and 221-171-029 located off Country Lane, Ettersburg, Humboldt County, California.

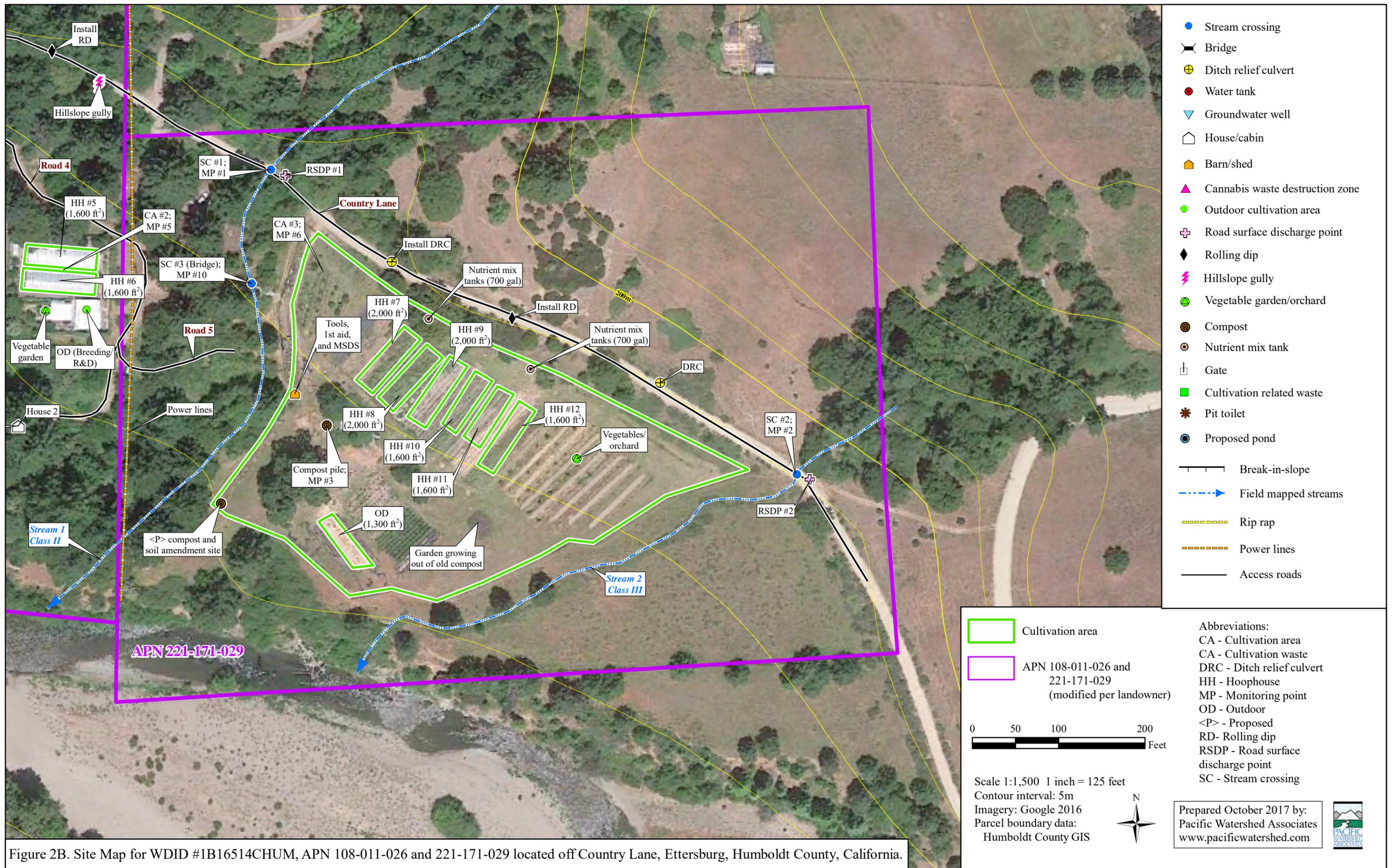


Figure 2B. Site Map for WDID #1B16514CHUM, APN 108-011-026 and 221-171-029 located off Country Lane, Ettersburg, Humboldt County, California.

3.0 INTRODUCTION

This Water Resources Protection Plan (WRPP) summarizes the results of Pacific Watershed Associate's (PWA) site visit and subsequent analysis and documentation of site conditions on APNs 221-171-029 & 108-011-026 located off Country Lane, Ettersburg, 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. Legible 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 APNs 221-171-029 & 108-011-026 as of 8/3/2017

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.

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? No

Observations/Comments: Roads lack permanent drainage structures to break up flow and minimize hydrologic connectivity. Roads hydrologically connected to watercourses deliver at 2 locations (MP #1, and MP #2). Approximately 320 feet of right road deliver to Stream Crossing #1 (SC #1) via road surface runoff and an un-rocked inboard ditch, and approximately 510 feet of left road deliver to SC #1 via an un-rocked inboard ditch. At SC #2, approximately 250 feet of left road surface runoff is delivered via an un-rocked inboard ditch. Right road delivers approximately 200 feet of road surface runoff via an un-rocked inboard ditch. The gentle gradient of the roads (0%-3%) contributes to the lack of erosive force of the delivering road surface runoff, evidenced by the lack of heavy scour, deep channelization, or large diameter aggregate transport observed in the ditch. Hillslope drainage overtops and floods roads and low lying areas during heavy rainfall events, but ponds up and infiltrates in localized natural depressions, and does not deliver. The landowner plans to develop an erosion control plan (ECP) and direct rain flow around and away from roads and farmlands. Coordinating with Sanctuary Forest, and other consultants, the landowner would like to create small ponding recharge basins to help replenish the groundwater aquifer at existing low lying areas on the property which experience periodic flooding during wet-weather events. A rainwater catchment pond (see Figure 2 for proposed location) may help to prevent some of the sheet flow from flooding the lower property.

Photos: Photo #1 MP #1; Photo 2 MP #2

Corrective or remedial actions needed: The addition of rolling dips and/or ditch relief culverts (DRC) are recommended to break up undrained road reaches. See Figure 2 for recommended rolling dip and DRC locations. Rocking the inboard ditch will aid in keeping fine particles from being delivered to surface waters. As part of an erosion control plan, the landowner plans on contracting with additional consultants to aid in the replenishment of the local groundwater aquifer, and developing a management plan for stormwater runoff.

- 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? No

Observations: Minor rilling and surface erosion is present on the main and secondary roads. Inboard ditches are un-rocked, however low gradient topography of road network and ditches suggests that runoff will carry little erosive force, minimizing erosion related delivery. Breaking up the ditch flow by adding additional DRCs will significantly reduce the delivery potential of the in board ditch at both delivery locations.

Photos: Photo #1 MP #1; Photo 2 MP #2

Corrective or remedial actions needed: Additional rolling dips and/or ditch relief culverts (DRC's) are recommended to break up undrained road reaches. See 4.1a corrective or remedial actions needed above.

- 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? Yes

Observations/Comments: Currently no concentrated runoff drains over potentially unstable slopes. No unstable fills were located on the property. A berm created from recent road maintenance exists on the outboard edge of the road network. At the time of PWA's site visit, and due to the mostly in-sloped nature of the road, the berm was not deemed as an imminent threat to water quality. However, if not vegetated or stabilized, the berm will eventually erode and sediment may make its way via the road network to the hydrologically connected watercourses at SC #1 and SC #2. It is recommended that this berm be removed, and spoiled locally in a stable location that poses no threat to water quality.

Photos: No

Corrective or remedial actions needed: Spoil berm locally in a stable location, far from any watercourse. Seed and mulch spoil pile to mitigate any threat of sediment delivery.

- 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: Roads lack permanent drainage features necessary to disconnect them from watercourses. Cultivation areas are all on natural terraces or conform to natural topography. No sediment delivery results from these cultivation areas. See above comments 4.1a.

Photos: Photo #1 MP #1; Photo 2 MP #2

Corrective or remedial actions needed: See 4.1a corrective or remedial actions needed above.

- 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? No

Observations/Comments: Inboard ditches created from recent grading and past road maintenance hydrologically connect approximately 1,280 feet of road to stream crossings on the Project Site. See above comments and corrective or remedial actions needed 4.1a.

Photos: Photo #1 MP #1; Photo 2 MP #2

Corrective or remedial actions needed: Additional rolling dips and/or DRC's are recommended to break up undrained road reaches. Install ditch relief culverts to drain the ditches and hydrologically disconnect the road network from stream crossings at MP #1 and MP #2. See Figure 2 for recommended locations for rolling dips and DRC's.

- 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 stockpiled construction materials were observed on the Project Site that posed any threat to any watercourse or water quality.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #1. - General comments and recommendations: *In general, the Project Site contains roads that are well maintained, and at a low gradient. Overall, the threat to water quality posed by this road network is low. Located on a natural river bend flat, the road network parallels the river, and exhibits no major gains or losses in elevation. There are two locations (MP #1 & MP #2) at which the road network is hydrologically connected and directly delivers to a watercourse via an inboard ditch. PWA recommends disconnecting the road network by breaking up ditch flow with ditch relief culverts at frequent intervals, and before stream crossings. (See Figure 2. for recommended DRC locations). The installation of rolling dips or other similar permanent drainage features will help disconnect the road surface from any water course. Additionally, adding rock armor to the native soil inboard ditch will help mitigate sediment transport and delivery during high flow events.*

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? No

Observations/Comments: There are 3 stream crossings on the Project Site; SC #1, a 36" diameter steel culvert on a Class II watercourse crossing County Lane; SC #2, a

crushed 24" diameter steel culvert on a Class III watercourse crossing Country Lane; and SC #3, a 28.5 foot long by 8 foot wide bridge spanning a Class II watercourse on a private road. Two Stream Crossings on the property, SC #1 and SC #2, are undersized for the 100 year storm event and associated debris.

Photos: Photo #3-#5 MP #1; Photo #5-#8 MP #2

Corrective or remedial actions needed: Upgrade SC #1 with a 60 inch diameter by 25 foot steel culvert, set at the base of fill, at natural channel grade and in the correct horizontal orientation of the native channel. Upgrade SC #2 with a 36 inch diameter by 30 foot steel culvert, set at the base of fill, at natural channel grade and in the correct horizontal orientation of the native channel.

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

Meets condition? No

Observations/Comments: Two Stream Crossings SC #1 & SC #2 are undersized for the 100 year storm event and associated debris.

Photos: Photo #3-#5 MP #1; Photo #5-#8 MP #2

Corrective or remedial actions needed: Upgrade undersized stream crossings and include measures to pass 100-yr discharge and debris in transport. See corrective or remedial actions needed 4.2a above.

- 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? No

Observations/Comments: At the outlets of both SC #1 and SC #2, a 4 foot plunge was noted from outlet of culvert to bottom of flow path. It is unknown if fish are present in any of these watercourses.

Photos: Photo #5, MP #1; Photo #7, MP #2

Corrective or remedial actions needed: Upgrade undersized stream crossings and include measures to pass 100-yr discharge and debris in transport. See corrective or remedial actions needed 4.2a above.

- 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? No

Observations/Comments: Road approaches to SC #1 and SC #2 are hydrologically connected with a series of inboard ditches. Erosion from these ditches has the potential to delivery directly to these watercourses. Undersized culverts at both SC #1 and SC #2 have resulted in floodwater attempting to flank the culvert, evidenced by erosion surrounding inlet and depositional material accruing adjacent to culvert inlets. As both culverts are set high in the fill, 4 foot plunges are present at both outlets, with a large scour pool forming at SC #1. Flow path at outlet was not observed at SC #2 due to inaccessibility, depth of plunge was determined at this location by inserting tape-measure down past outlet until ground surface was reached.

Photos: Photo #1, #3-#5, MP #1; Photo #2, #6- #7, MP #2

Corrective or remedial actions needed: Upgrade undersized stream crossings and include measures to pass 100-yr discharge and debris in transport. See corrective or remedial actions needed 4.2a above.

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

Meets condition? No

Observations/Comments: Neither SC #1 nor SC #2 are set at grade, but both appear to be in proper alignment with the natural channel.

Photos: Photo #5, MP #1; Photo #7, MP #2

Corrective or remedial actions needed: Upgrade SC #1 and SC #2 with culverts sized to convey the 100 year storm flow event. Install culverts in line with the natural stream grade, and natural channel alignment. See corrective or remedial actions needed 4.2a above.

- 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? No

Observations/Comments: Stream crossings # 2 has diversion potential and requires the installation of a critical dip to prevent diversion in the event that the culvert is overtopped.

Photos: No

Corrective or remedial actions needed: Install one critical dip at SC #2.

Standard Condition #2. - General comments and recommendations: SC #1 and SC #2 within the Project Site are undersized for the 100 year storm flow event and associated debris. SC #2 exhibits diversion potential, and requires a critical dip to be installed on the right hinge line of the crossing. Upgrade SC #1 with a 60 inch diameter by 25 foot steel culvert, set at the base of fill, at natural channel grade and in the correct horizontal orientation of the native channel. Upgrade SC #2 with a 36 inch diameter by 30 foot steel culvert, set at the base of fill, at natural channel grade and in the correct horizontal orientation of the native channel.

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? Yes

Observations/Comments: See general comment below.

Photos: MP #4, MP #5, MP #6

Corrective or remedial actions needed: None

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

Meets condition? Yes

Observations/Comments: See general comment below.

Photos: MP #4, MP #5, MP #6

Corrective or remedial actions needed: None

- 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? Yes

Observations/Comments: See general comment below.

Photos: MP #4, MP #5, MP #6

Corrective or remedial actions needed: None

- 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? Yes

Observations/Comments: See general comment below.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #3. - General comments and recommendations: All cultivation areas on the Project Site are greater than 110 feet from any watercourse. All cultivation areas are on naturally flat terraced areas, with wide, native vegetative buffers surrounding the garden sites. All riparian areas are undisturbed, and their essential functions are protected by the current practices taking place on the Project Site. Upon the initial site visit, a vegetable bed within cultivation area 3 was located within 100 feet of a Class 2 stream. Due to the wide existing buffer, no evidence of pollutant delivery was observed or suspected. Upon the second site visit, no evidence of pollutant delivery was noted. The buffer has remained intact. The landowner will continue to monitor site for any sign of pollutant delivery. If any evidence of pollutant delivery is observed, setback vegetable garden to a minimum of 100 feet from the stream.

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? Yes

Observations/Comments: Potting soil, compost, old plant material from various farmed vegetables was observed at several stable locations throughout the farm. Much of these spoil areas were in natural low lying areas, and were tarped, or had other BMPs in place such as straw mulching. These spoils posed no threat of delivery to any watercourse. The spoil piles posed little to no threat to water quality. The landowner led PWA staff to the disposal area and onsite shredder which are used to mulch, and then compost all old organic material. Compost is then used to re-amend the soil,

minimizing the need to purchase fertilizer, or bring soil from offsite. Potting soil tailings, and old root balls (wastes) were observed and located in stable locations, which posed no threat of delivery to any watercourse. This “waste” material is hauled off the property on a bi-weekly basis by use of small dump truck owned by the farm.

Photos: Photos #9-11, MP #3

Corrective or remedial actions needed: Continue to shred and mulch plant stalks and leaves, re-amending the soil as compost is available.

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

Meets condition? Yes

Observations/Comments: See observations/comments 4.4a above.

Photos: No

Corrective or remedial actions needed: None

- 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: Spoils generated through recent road maintenance activities have resulted in an earthen berm lining the inboard edge of the road network. This berm has is in a stable location, and no evidence of runoff or delivery was noted at the time of the site visit. The road is mostly in-sloped, and drains to an inboard ditch that runs most of the length of the road.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #4 - General comments and recommendations: Based on field observations it is PWA’s opinion that the Project Site is currently compliant with this condition. A compost/soil pile is being stored within the flat garden area (cultivation area 3), with sufficient buffer to the stream. It is recommended that straw wattles be installed around the soil stockpile for perimeter control purposes. Ultimately, a covered area with an impermeable (concrete slab or other) flooring for all compost and soil storage should be constructed, such that any chance for seepage or infiltration of potential pollutants to the aquifer is mitigated. Several small well managed spoils and other cultivation related wastes were observed on the project site, but all were appeared to be in stable, well thought out locations and were slated for disposal, or re-amendment. Observations and conversations with the landowner indicate that good housekeeping practices are in effect on this farm, with frequent waste removal trips being carried out on a continual basis. All spoils were located in stable, low lying areas far from any water courses, such that no threat of delivery or transport to any watercourse was present.

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? Yes

Observations/Comments: While storage totals may not be sufficient to forbear for the entire cultivation season, water is used sparingly and efficiently on the farm. The landowner has an appropriative water right on file with the State Division of Water Rights, and is using far less than what is allocated to the Project Site. See General comments below. All water used for the Project Site comes from river underflow, via shallow groundwater wells installed decades ago by previous homesteaders and farmers.

Photos: Photos #15-16

Corrective or remedial actions needed: A Water Budget should be developed to determine sufficient storage volumes for low flow periods during the dry season. A Water Monitoring Plan will also need to be developed (see comments below).

- 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 is used carefully on the farm. The landowner has begun working with Sanctuary Forest to develop and maintain a conscious water use plan. The landowner has also stated that ultimately, the goal of the farm is to create and maintain “aquifer recharge basins”, such that rain and road runoff waters which have traditionally ponded in various spots on the farm, are allowed to do so in a beneficial way that helps to recharge the aquifer. In addition to controlled hand watering, all cultivation areas and greenhouses are equipped with timed drip emitters and irrigation lines. Raised beds are also used to aid in the water conservation process. The landowner has expressed interest in developing rainwater catchment systems, and may install a rainwater catchment pond if conditions on the property permit.

Photos: Photo #12, #14

Corrective or remedial actions needed: Consider the development of rainwater catchment systems, straw mulch cover on top of the soil surface, incorporating water holding amendments and native soil during the initial soil preparation at the start of the season. Water conservation measures should continue to be investigated and employed to minimize flow diversions.

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

Meets condition? No

Observations/Comments: See general comment below. Partial storage has been developed, but more may be needed. Currently there exists 49,000 gallons of storage on the Project Site, all in the form of rigid plastic storage tanks. The landowner has expressed interest in developing rainwater catchment systems, and may install a rainwater catchment pond if conditions on the property permit.

Photos: Photo #13

Corrective or remedial actions needed: Increased water storage is recommended.

Develop a rainwater catchment system to fill the water storage tanks and limit diversion of surface flow to the winter months. Develop a water budget to ensure that required irrigation totals are known. A licensed Engineer should be consulted with regards to the siting and installation of a rainwater catchment and sheet flow runoff pond.

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

Meets condition? Yes

Observations/Comments: According to the landowner and operations manager, water is applied sparingly and in a conservative fashion. Application was observed at the time of the follow up site inspection, no evidence of irrigation runoff or overwatering were observed. Project Site appears to be compliant with this condition.

Photos: Photo #14

Corrective or remedial actions needed: 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, in order to develop a Water Budget for your operation. See the attached preliminary water budget developed for your project site in **Section 7** below, and work to refine it continually adding data as you have it to your water budget.

- 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? Yes

Observations/Comments: See general comments below.

Photos: Photos #15-#16

Corrective or remedial actions needed: The landowner has an existing appropriate water right filed with the State of California Division of Water Rights for the use of shallow groundwater wells (License # 12029), and has filed with the State Water Board a Statement of Diversion and Use prior to July 1st, 2017. The landowner will continue to file supplemental statements each following year. Check the permit status with Humboldt County Department of Environmental Health, include permits and all supplemental documentation with this WRPP in case of inspection.

- 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: All tanks and storage facilities are well sited. The largest of which is the 40,000 gallon tank farm, located to the east of CA #1. CA #1 is situated on a large flat terrace, which is in-sloped away from the Mattole River, located approximately 300 feet away from the watercourse. Thus, in the unlikely event of a

containment failure, all stored waters will pond and saturate the terrace. This poses no threat of delivery to waters of the state.

Photos: Photo #13

Corrective or remedial actions needed: None

Standard Condition #5 - General comments and recommendations: All water needs for the farm are supplied by an appropriative water right, which allows the landowner to take up to 14 acre feet per year. The actual uses of the farm are far below this number, and fall below 1 acre foot per year. Water is drafted through 2 wells installed by previous landowners. Permit ID# 17066; issue date 2/6/1978, License ID# 12029; issue date 11/12/1986. Water is highly conserved on the project site, landowner is conscious of water uses, and strives to eliminate wasteful watering practices. All cultivation and farm areas were serviced with drip line irrigation, and all soils were amended with compost and other moisture retaining media. Controlled hand watering is used to only supplement water and fertilization needs of the various crops on an as-needed basis. To comply with and to support forbearance measures, the landowner has begun increasing storage volumes on the farm site, such that all of CA #1 is able to be supplied with stored water. In an effort not to de-water tributaries and small supporting stream networks, the landowner only draws from Mattole River Underflow current, through the use of a registered well and water right. PWA highly recommends, and state agencies may require, that you install flow meters on your water tanks and/or on your diversion lines, to accurately document your diversion volumes and rates. You will need to document the amount of water you are diverting, storing and using through time. PWA has created a simple log sheet to help you monitor your water usage.

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: See general comments below.

Photos: Photos #12, #14

Corrective or remedial actions needed: None

Standard Condition #6 - General comments and recommendations: Water use and irrigation practices are conducted efficiently on the Project Site. Because irrigation is mainly practiced with timed drip emitters and an irrigation system, supplemented on an as needed basis with hand watering with a valve at the terminus of the watering hose to manually turn water on and off, there is a high degree of control. With the closest stream located well away from the cultivation area, any runoff that theoretically might flow off the Project Site (from the cultivation area) could not travel far due to the low gradient topography and wide vegetative buffer between the cultivation area and the stream network.

According to the Order, irrigation and fertilization shall occur at agronomic rates and chemicals shall be applied according to the label instructions and specifications. Agronomic rates are those rates of application of water, fertilizers and other amendments that are sufficient for utilization by the crop being grown, but not at a rate that would result in surface runoff or infiltration below the root zone of the crop being grown.

In the event that irrigation runoff occurs or could occur, you shall ensure that contaminated runoff does not enter nearby watercourses. This can be accomplished by constructing or designing containment measures, including sediment basins, berms, infiltration ditches and/or other Best Management Practices (BMPs), as needed, to contain and control surface runoff (see Appendix A).

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? No

Observations/Comments: All fertilizers and amendments are stored inside an enclosed and covered plastic shed. Nutrient storage sheds lacked adequate secondary containment to contain the entire volume in the event of containment failures of the nutrient containers. One gas can was observed being stored inside of the nutrient storage facility. The landowner stated that this was an “unacceptable practice”, and that farm protocol was to not store petroleum related items with fertilizers and other soil amendments.

Photos: Photo #17; MP #7

Corrective or remedial actions needed: Remove any petroleum products from nutrient and soil amendment storage areas. Inform and educate staff and workers as to the storage requirements of the order. Hang signs in all designated nutrient storage areas to remind workers not to store petroleum products at these locations if necessary. Incompatible materials should not be stored together. To ensure that no nutrient runoff or infiltration to groundwater can occur in the event of a containment failure, install a containment basin sufficient in size to contain the full volume of the largest container of the stored inventory. Ensure similar storage measures are implemented at each nutrient storage location.

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

Meets condition? No

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

Photos: No

Corrective or remedial actions needed: You must keep detailed records 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 D or by using some other record keeping method. Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration is avoided. Also see general comments and recommendations below.

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

Meets condition? Yes

Observations/Comments: All cultivation areas are located on low gradient topography and have a wide vegetative buffer. Therefore, these sites do not present a large threat to water quality. Raised beds and in-ground row crops where nutrients are utilized are kept winterized by either tarping or covering with greenhouse covers when not in use.

Photos: No

Corrective or remedial actions needed: If you plan to burn the plant stalks, you'll first need to obtain burn permits from CAL FIRE and the North Coast Unified Air Quality Management District (or relevant jurisdiction for your area). You can then, incorporate the ash into the pots or planting holes prior to planting the cover crop to add minerals and recycle the ash.

Standard Condition #7 - General comments and recommendations: Based on field observations PWA noted that fertilizers and soil amendments were being properly stored. Most growing amendments will be brought inside during the growing season and either stored indoors or under tarps such that they are protected from the elements. Fertilizers and amendments were reported to be organic and applied according to packaging instructions. Usage is diminished or eliminated toward the end of the growing season. With the closest stream located well away from the cultivation area, any runoff that theoretically might flow off the Project Site could not travel far due to the low gradient topography and wide vegetative buffer between the cultivation area and the stream network.

Under the Order, you are required to keep track of the timing and volume of fertilizers and other soil amendments that are applied. This can be done using a simple log form we have provided in Appendix D.

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 will be employed and recommended application rates will be followed. Dr. Zymes (fermentation derived Citric Acid) is the only chemical applicant (pesticide/herbicide) that is used on plants (as per landowner and operations manager). Dr. Zymes is OMRI listed, and accepted for organic farming practices.

Photos: No

Corrective or remedial actions needed: All pesticides, herbicides and related materials (e.g., fungicides) must be used and applied consistent with product labeling. When present, these chemicals should be stored within enclosed buildings in such a way they cannot enter or be released into surface or ground waters. The Order requires you to keep a detailed log of all pesticide and herbicide use.

Standard Condition #8 - General comments and recommendations: No pesticide or herbicide chemicals were observed on the site during our inspection. 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 continue to utilize organic or biologic controls, rather than highly toxic petro-chemicals, to prevent pest and mildew problems. Several safe alternatives are available. Please ask about our cultivators BMP handbook.

Under the Order you are required to keep records (logs) of the 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 D. 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

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? No

Observations/Comments: A few storage sites exemplified both proper secondary containment and adequate covering. However, numerous small gas cans and small petroleum powered devices were observed lacking the required secondary containment. Note that petroleum products onsite will need to be stored under cover, off the ground and in a secondary containment basin (tote, tub, etc.). One large generator (emergency backup purposes, farm has grid power) was located on the project site. This was a trailer mounted mobile generator, and was housed under a permanent roof.

Photos: Photos #18-#19, Photo #20; MP #8

Corrective or remedial actions needed: Ensure that all petroleum products are adequately contained and covered as per the requirements of the order. The freeboard of the secondary container should be sufficient to capture the entire stored volume of container.

- 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: There are no above ground storage tanks on the project site.

Photos: No

Corrective or remedial actions needed: None

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

Meets condition? Yes

Observations/Comments: No diked areas were present on the Project Site.

Photos: No

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 prevention cleanup kit is kept onsite to help clean up small spills.

Photos: No

Corrective or remedial actions needed: Have multiple spill prevention cleanup kits onsite at all times to help clean up small spills. Keep spill kits in well-marked areas where refueling will occur, or where petroleum powered devices are typically used. Ensure that staff and workers know where these spill kits are located, and how to use them in the event of a spill.

- 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? Yes

Observations/Comments: No underground storage tanks were present on the Project Site.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #9 - General comments and recommendations: There are no fuel storage containers on the Project Site other than several small gas cans, and medium sized (25 kilowatt) mobile generator used for emergency backup power. The farm is on grid power, and does not rely heavily on petroleum products for farm related activities. Recently the landowner switched all of the farm's fleet vehicles on the Project Site (UTV's and golf carts) to electric, further minimizing the reliance on fossil fuels required on the project site. All petroleum products need to be stored with adequate covering, and have secondary containment such that the largest stored container can be completely held in the event of a containment failure.

Note that the State of California requires an owner or operator of a facility to complete and submit a Hazardous Material Business Plan (HMBP) if the facility handles a hazardous material or mixture containing a hazardous material that has a quantity at any one time during the reporting year equal to or greater than: 55 gallons (liquids), 500 pounds (solids), or 200 cubic feet for compressed gas (propane) used for the cultivation operations. If at any time during the year your operations exceed any one of these quantities, you need to prepare and file a HMBP for your operation. Information regarding HWBPs can be found at <http://ca-humboldtcounty.civicplus.com/DocumentCenter/Home/View/3224>.

Additionally, while it is not explicitly stated in the Order, please note that the Humboldt County Division of Environmental Health (HCDEH) also requires that anyone that has over 55 gallons or more of any petroleum liquid at any time of the year, including fuels and waste oil, develop a HMBP.

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? No

Observations/Comments: The farm will be compliant with The Order once adequate covering and tarping is in place of all cultivation related wastes. At the time of PWA's site inspection, all cultivation related wastes and byproducts were stored in stable locations, and disposed of at bi-weekly intervals. Organic plant matter is taken to a designated shredding location, and chipped and shredded with an onsite shredder. Shredded plant matter (stalks) are then composted and re-integrated into the soil as an

amendment. Water leaves are composted directly, and added back into soil as an amendment. Root balls and the small amount of spent soil contained therein are stored in a stable location, and hauled off site for disposal at bi-weekly intervals. Adding cover in the form of tarping, or a stable or shed style roof would ensure that these waste accumulation areas are compliant with the order.

Photos: Photos #9-#11; MP #3.

Corrective or remedial actions needed: Housekeeping practices on the farm are in good form. The implementation of a few small changes will ensure that the Project Site achieves compliance with The Order. Spent soil and root balls have thus far been stored in a stable location. To be compliant with The Order, these waste items must be covered from rainwater, and pose no threat of delivery to any watercourse, nor any threat of leaching into the aquifer. Add a tarped cover, or construct a covering such that rainfall poses no threat of leaching any entrained nutrients into the groundwater. Utilize other sediment mitigating best management practices (BMPs) such as berms, sediment collection basins, or straw wattles to entrain waste water runoff, and trap entrained particulate to ensure that no soil or compost material is transported to streams, rivers, or any other watercourse.

Standard Condition #10 - General comments and recommendations: Based on field observations, it is PWA's opinion that the Project Site is mostly compliant with the cultivation-related wastes condition. The addition of covering to the designated waste, shredding, and composting sites will make this Project Site compliant with The Order. All compost and waste areas are well sited, and pose no threat of delivery to any surface waters. In the interim period of time, simply tarping or covering with some impermeable membrane will keep the farm in compliance with The Order. For the long term, it will be more efficient to have an area that can be tilled easily, walked in and out of, or driven into with the bucket of a loader or tractor. If any runoff or migration of any waste or compost piles is noted, securely place straw wattles in a downslope perimeter of the pile, to ensure that any entrained particulates are stopped at the wattle perimeter.

We encourage you to continue chip or shred your plant stalks and compost them after harvest, re-amending your soil as you cultivate into the future. If you burn the stalks, you must first obtain burn permits from CAL FIRE and the North Coast Unified Air Quality Management District (or other relevant jurisdiction for your area). You can then recycle the ash and add minerals to the soil by mixing the ash into your spent pots and plant holes prior to planting a cover crop at the end of the season.

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 Project Site has two (2) outhouses which appear to still be in use. The closest of which is over 350 feet from any watercourse. The landowner

has 1 OWTS onsite, which was professionally upgraded 15 years ago, and according to the landowner, is well-functioning. The location was not observed during PWA's site inspection. The landowner is in the process of engineering plans for 3 additional OWTS onsite, but has not installed them at this time. Discussions with the landowner indicate that all required permitting and professional oversight will be followed before the installation and implementation of these systems.

Photos: Photo #21-#22; MP #9

Corrective or remedial actions needed: A permitted septic system is required as per The Order. Keep records of your permits and all supporting documentation with this WRPP in case of an inspection. If you are unsure as to the permit status of the current in use septic system, research the status with Humboldt County Department of Environmental Health (HCDEH). If the current septic system is not permitted, additional field investigation may be required to determine the size and functionality of the existing OWTS. Additional investigation may include percolation testing, soil sampling, and groundwater monitoring to determine if the system is suitable for the site conditions, and maximum level of use. If the existing OWTS cannot be permitted, work with a professional to engineer, site and install the number of OWTS necessary to maintain sanitary conditions on site. The system must be designed to serve the maximum amount of people onsite at any time, likely when cultivation operations are at their peak.

All existing outhouses and unpermitted pit toilets on the Project Site must be removed and decommissioned. Contact HCDEH for specifics related to decommissioning. Until a permitted and approved OWTS can be installed, contract with a local service provider to install and service enough portable toilets to serve the needs of the entire farm staff, including people who visit or tour the farm. Keep service records with this WRPP for possible inspection.

- 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: The Project Site was clean at the time of PWA's inspection. All throughout the project site, there exist designated waste and recycling receptacles, all consisting of lidded trash cans and covered areas. All areas in which workers were observed or expected to be observed had several lidded cans, designated "recycling" and "trash".

Photos: Photo 23

Corrective or remedial actions needed: Continue good housekeeping practices.

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

Meets condition? Yes

Observations/Comments: The Project Site was clean at the time of PWA's inspection. The operator periodically hauls refuse offsite and disposes of said refuse at an appropriate waste disposal facility. A small garbage truck owned by the farm is implemented to make bi-weekly dump runs.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #11 - General comments and recommendations: The Order requires a permitted and approved OWTS. The permitting status of the existing OWTS is not known at this time. PWA recommends contacting the HCDEH to determine the permitting status of the existing OWTS. If the existing system is not permitted, research retroactive permitting options or conduct subsurface investigations for a new OWTS. Unless approved by HCDEH, the pit toilet on the Project Site should be decommissioned. Additional observations made on this Project Site is that it is relatively clean and garbage is both secured properly, removed on a regular basis and disposed of at an appropriate waste disposal facility.

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 outsloping and rolling dip installation where safe and suitable, installing ditch relief culverts and overside drains, removing berms, stabilizing unstable areas, reshaping cutbanks, and rocking 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: See general comments below.

Photos: No

Corrective or remedial actions needed: None

Standard Condition #12 - General comments and recommendations: It is PWA's opinion that the Project Site is currently compliant with this condition. All needed corrective actions are addressed in Standard Conditions 1 through 11.

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.

Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)							
Standard Condition Requiring Action	Treatment Priority	Schedule	Corrective Action/Recommendation	Map Point and Photo #	Estimated Cost	Date Completed	
4.1 – Site Maintenance, Erosion Control and Drainage Features	1a, b, d, e	High	June, 2018	Install several road drainage features (RD's, DRC's) to break up long undrained road reaches. See Figure 2. for specific locations. Address potential sediment delivery threats from outboard fill berm by spoiling locally, far from any watercourse in a location that will not deliver sediment to any watercourse. Seed and mulch spoil pile with native vegetation. Adding rock armor to the native soil inboard ditches will help mitigate erosion of the road prism material itself during high flow events.	Photo #1, #2; MP #1,#2		
4.2 – Stream Crossing Maintenance	1a, b, c, d, e, f	High	June 2019	Upgrade undersized stream crossings #1 & #2 with 60" x 25 foot and 36" x 30 foot steel culverts respectively to convey the 100-yr discharge with debris in transport. Install culverts at the base of fill, at natural channel grade and in the native horizontal orientation of the natural channel. Install one critical dip (CD) at stream crossing #2 along the right hinge-line of the crossing. *Note: All stream crossing work must be designed and implemented with all required permits which may include but may not necessarily be limited to: CDFW 1602 LSAA, ACOE 404, SWRCB 401, Humboldt County Building/Grading Permit, etc.	Photo #3-#5; MP #1, Photo #5-#7; MP #2, Photo #34-35; MP #10		

Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)							
Standard Condition Requiring Action		Treatment Priority	Schedule	Corrective Action/Recommendation	Map Point and Photo #	Estimated Cost	Date Completed
4.5 – Water Use	5c	Moderate	Monitoring June 2018 and then annually; Storage Volumes by May 2021	Increase your water storage capacity to match your water demand for all cannabis irrigation during the forbearance period. Develop a water monitoring plan, log water pumped from the wells, storage and use using the log sheets provided in Appendix B. Continue to refine and develop the provided preliminary water budget for the farm. Continue to investigate and implement efficient water use strategies, including developing a rainwater catchment system to bolster your storage amounts.	Photo #13		
4.7 - Fertilizer and Amendment Use	7a	Moderate	June 2018	Remove all petroleum products from any areas where nutrients are stored. Provide secondary containment adequate to contain at a minimum the largest container size stored in the shed in the event of a containment failure. Ensure secondary containment is adequate at each nutrient storage location.	Photo #17; MP #7		
	7b	Moderate	2016 and then annually	Document fertilizer and amendment use on log sheets provided in Appendix E. These must be detailed, and kept with your WRPP to be compliant with The Order.	None		
4.8 – Pesticides and Herbicides	8a	Moderate	2017 and then annually	Document pesticide, herbicide, and fungicide use on log sheets provided in Appendix F.	None		
4.9 – Petroleum Products and Other Chemicals	9a	Moderate	December 2017	Store all petroleum products under cover and in a secondary containment basin (tote, tub, etc.).	Photo #18-#19, #20; MP #8		
	9d	Moderate	December 2017	Acquire spill prevention supplies and place where easily accessible in case of accidental spill.	None		
4.10 – Cultivation Related Wastes	10a	Moderate	December 2018	Develop covering strategies (tarping, cover cropping, or roof construction) for all compost, spoils, and waste piles. Utilize BMPs to ensure that no runoff or transport from any spoil piles occurs.	Photo #9-#11; MP #3		
4.11 – Refuse and Human Waste	10a	High	December 2020	Work to permit the existing septic system. If it cannot be retroactively permitted, work with a licensed professional to design and install a new system. Discontinue the use of the two (2) pit toilets onsite, & work with HCDEH to decommission them. Until a permitted and approved	Photo #21-22; MP #9		

Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)						
Standard Condition Requiring Action	Treatment Priority	Schedule	Corrective Action/Recommendation	Map Point and Photo #	Estimated Cost	Date Completed
			OWTS can be installed, contract with a local service provider to install and service portable toilets sufficient to satisfy the needs of the farm at peak staffing times.			

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 November 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 15th to October 31st. This will ensure the timing of water use is not impacting water quality objectives and beneficial uses. If additional storage is necessary, the project setting provides many stable locations where water tanks may be safely placed if needed.

Water Conservation - Water conservation measures currently practiced include growing many of the plants in-ground, and cultivating in raised beds (as compared to above ground pots). In addition to controlled hand watering, a timed drip line irrigation system is in place. As part of the farm operations, unwanted plant material is composted and continually re-amended to the soil, along with other water holding amendments. Moving forward, new water conserving techniques and equipment will be utilized and tested to evaluate effectiveness and efficiency including rainwater catchment, and watering late in the afternoon or evening to minimize water loss through evaporation and maximize water up-take by the plants.

Water sources and use – Currently, all water on the project site comes from 2 legacy wells installed by previous landowners decades ago. The current landowner is drafting water pursuant to a valid and registered appropriative water right.

Preliminary Water Budget – Based on a cultivation area of ~24,100 ft², and assuming a water requirement of 10 gal / square foot / growing season, this estimate yields a seasonal water use of 241,000 gallons.*note that there are other vegetables and fruits being grown on the property, this estimate is valid for cultivation of cannabis only. As storage totals for the farm currently equal 49,000 gallons, additional storage will be required in the event that forbearance is required for the Project Site.

Over the course of the current season, water use will be documented using the log forms attached in Appendix C. Water rights notifications and registrations will be submitted to the State Water Resource Control Board (Division of Water Rights) and a Lake and Streambed Alteration Agreement (LSAA) sought through the California Department of Fish and Wildlife (CDFW). 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.

Because this is the first year of enrollment, 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:

Fertilizers and amendments:

Clonex	Fert / Liquid	1-.6-1	50 gal/yr
Ryzotenci	Fert / Liquid	0-0-0	25 gal/yr
Biogrow	Fert / Liquid	4-0-3	100 gal/yr
Biobloom	Fert / Liquid	1-2-2	125 gal/yr
Tappin' Roots	Fert / Liquid	.01-0-.01	125 gal/yr
Vitaminos	Amend/Liquid	.1-0-0	25 gal/yr
MaxiCrop Seaweed	Fert / Liquid		
Azomite	Amend/Solid	n/a	200 lbs/yr
Dolomite	Amend/Solid	n/a	200 lbs/yr
Molasses	Fert / Liquid	1-0.1-3	30 gal/yr
Alaska Fish Fert	Fert / Liquid	5-1-1	100 gal/yr
Eco-Fish Bloom	Fert / Solid	4-23-0	50 gal/yr
EM1 – Bokashi	Amend/Solid	n/a	100 gal/yr
Baseline	Amend/Solid	n/a	50 gal/yr
Trace Minerals	Amend/Solid	.02-.05-.40	20 lbs/yr
Glacier Rock Dust	Amend/Solid	0-0-0	200 lbs/yr
Calphos	Amend/Solid	0-3-0	225 lbs/yr
Stutzmans Chicken	Amend/Solid	0-1-1	500 lbs/yr
EM1	Amend/Liquid	n/a	25 gal/yr
Milk Powder	Amend/Solid	n/a	300 lbs/yr
Worm Castings	Amend/Solid	n/a	400 lbs/yr

Pesticides, Herbicides, and Fungicides:

“Dr. Zymes” – all-purpose organic pesticide and fungicide (mildew, mite, aphid, fungus gnats)

Petroleum and Other Chemicals:

Gasoline, Diesel

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): _____

Title (owner, lessee, operator, etc.): _____

Signature: _____ Date: _____

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

WRPP prepared and finalized on (date): _____

Signature: _____ Date: _____

Appendix A:

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

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

I. Introduction

Best management practices (BMPs) provided here may be applicable to prevent, minimize, and control the discharge of waste and other controllable water quality factors associated with site restoration/cleanup/remediation and site operations and maintenance. These BMPs are all considered enforceable conditions under the Order as applicable to a given site, and are referenced by and made conditions in the mitigated negative declaration (CEQA document) for the Order, as well.

This appendix to Order No. R1-2015-0023 includes section II. Standard BMPs for Construction, section III. BMPs for Site Maintenance and Operations (per standard conditions), and section IV. References. For additional BMP suggestions, staff encourage consultation of the various manuals listed in section IV. References, many of which are available online for free.

II. Standard BMPs for Construction

Where applicable during restoration, remediation, cleanup, or site maintenance activities, the following BMPs will be used.

A. General BMPs to Avoid or Minimize Adverse Impacts

Temporal Limitations on Construction

1. To avoid impacting migrating fish and causing erosion and sedimentation of the stream channel, the project work season shall be from May 1 to October 15. If operations are to be conducted during the winter period from October 15 to May 1, a winter period operating plan must be incorporated into the project work plan. This plan shall include specific measures to be taken in the winter operating period to avoid or substantially lessen erosion and sedimentation into surface waters.
2. A 2-day (48-hour) forecast¹ of rain shall be the trigger for temporary cessation of project activities and winterization/erosion protection of the work site.

¹ Any weather pattern that is forecasted by NOAA to have a 50% or greater probability of producing precipitation in the project area. The permittee shall obtain and keep for record likely precipitation forecast information from

Limitation on Earthmoving

3. Disturbance to existing grades and vegetation shall be limited to the actual site of the cleanup/remediation and necessary access routes.
4. Placement of temporary access roads, staging areas, and other facilities shall avoid or minimize disturbance to habitat.
5. Disturbance to native shrubs, woody perennials or tree removal on the streambank or in the stream channel shall be avoided or minimized. If riparian trees over six inches dbh (diameter at breast height) are to be removed, they shall be replaced by native species appropriate to the site at a 3:1 ratio. Where physical constraints in the project area prevent replanting at a 3:1 ratio and canopy cover is sufficient for habitat needs, replanting may occur at a lesser replacement ratio.
6. If shrubs and non-woody riparian vegetation are disturbed, they shall be replaced with similar native species appropriate to the site.
7. Whenever feasible, finished grades shall not exceed 1.5:1 side slopes. In circumstances where final grades cannot achieve 1.5:1 slope, additional erosion control or stabilization methods shall be applied as appropriate for the project location.
8. Spoils and excavated material not used during project activities shall be removed and placed outside of the 100-year floodplain, and stored/disposed of in compliance with Order conditions related to spoils management.
9. Upon completion of grading, slope protection of all disturbed sites shall be provided prior to the rainy season through a combination of permanent vegetative treatment, mulching, geotextiles, and/or rock, or equivalent.
10. Vegetation planting for slope protection purposes shall be timed to require as little irrigation as possible for ensuring establishment by the commencement of the rainy season.
11. Only native plant species shall be used with the exception of non-invasive, non-persistent grass species used for short-term vegetative cover of exposed soils.
12. Rock placed for slope protection shall be the minimum necessary to avoid erosion, and shall be part of a design that provides for native plant revegetation and minimizes bank armoring.

Limitations on Construction Equipment

13. Dischargers and/or their contractors shall ensure that chemical contamination (fuel, grease, oil, hydraulic fluid, solvents, etc.) of water and soils is prohibited during routine equipment operation and maintenance.
14. Heavy equipment shall not be used in flowing water. Please refer to BMPs 57 through 64 for dewatering of live streams.

the National Weather Service Forecast Office (e.g. by entering the zip code of the project's location at <http://srh.noaa.gov/forecast>).

15. When possible, existing ingress or egress points shall be used or work shall be performed from the top of the creek banks.
16. Use of heavy equipment shall be avoided or minimized in a channel bottom with rocky or cobbled substrate.
17. If project work or access to the work site requires heavy equipment to travel on a channel bottom with rocky or cobbled substrate, wood or rubber mats shall be placed on the channel bottom prior to use by heavy equipment.
18. Heavy equipment shall not introduce chemicals or foreign sediment to the channel (e.g., remove mud from tracks or cover channel work area with plastic sheeting prior to heavy equipment entry).
19. The amount of time this equipment is stationed, working, or traveling within the channel shall be minimized.
20. When heavy equipment is used, any woody debris and stream bank or streambed vegetation disturbed shall be replaced to a pre-project density with native species appropriate to the site. If riparian trees over six inches dbh are to be removed, they shall be replaced by native species appropriate to the site at a 3:1 ratio per BMP 5.
21. The use or storage of petroleum-powered equipment shall be accomplished in a manner that prevents the potential release of petroleum materials into waters of the state (Fish and Game Code 5650). To accomplish this, the following precautionary measures shall be followed:
 - Schedule excavation and grading activities for dry weather periods.
 - Designate a contained area for equipment storage, short-term maintenance, and refueling. Ensure it is located at least 50 feet from waterbodies.
 - Inspect vehicles for leaks and repair immediately.
 - Clean up leaks, drips and other spills immediately to avoid soil or groundwater contamination.
 - Conduct major vehicle maintenance and washing offsite (except as necessary to implement BMP 18).
 - Ensure that all spent fluids including motor oil, radiator coolant, or other fluids and used vehicle batteries are collected, stored, and recycled as hazardous waste offsite.
 - Ensure that all construction debris is taken to appropriate landfills and all sediment disposed of in upland areas or offsite, beyond the 100-year floodplain.
 - Use dry cleanup methods (e.g., absorbent materials, cat litter, and/or rags) whenever possible. If necessary for dust control, use only a minimal amount of water.
 - Sweep up spilled dry materials immediately.

Revegetation and Removal of Exotic Plants

22. The work area shall be restored to pre-project work condition or better.

23. All exposed soil resulting from the cleanup/restoration activities shall be revegetated using live planting, seed casting or hydroseeding.
24. Any stream bank area left barren of vegetation as a result of cleanup/restoration activities shall be stabilized by seeding, replanting, or other means with native trees, shrubs, and/or grasses appropriate to the site prior to the rainy season in the year work was conducted.
25. Soil exposed as a result of project work, soil above rock riprap, and interstitial spaces between rocks shall be revegetated with native vegetation by live planting, seed casting, or hydroseeding prior to the rainy season of the year work is completed.
26. The spread or introduction of exotic plant species shall be avoided to the maximum extent possible by avoiding areas with established native vegetation during cleanup/restoration activities, restoring disturbed areas with appropriate native species, and post-project monitoring and control of exotic species.
27. Removal of invasive exotic species is strongly recommended. Mechanical removal (hand tools, weed whacking, hand pulling) of exotics shall be done in preparation for establishment of native perennial plantings.
28. Revegetation shall be implemented after the removal of exotic vegetation occurs. Erosion control implementation shall be timed in accordance with BMPs 1 and 2.
29. Native plants characteristic of the local habitat shall be used for revegetation when implementing and maintaining cleanup/restoration work in riparian and other sensitive areas. Non-invasive, non-persistent grass species (e.g., barley grass) may be used for their temporary erosion control benefits to stabilize disturbed slopes and prevent exposure of disturbed soils to rainfall.
30. Annual inspections for the purpose of assessing the survival and growth of revegetated areas and the presence of exposed soil shall be conducted for three years following project work.
31. Dischargers and/or their consultant(s) or third party representative(s) shall note the presence of native/non-native vegetation and extent of exposed soil, and take photographs during each inspection.
32. Dischargers and/or their consultant(s) or third party representative(s) shall provide the location of each work site, pre- and post-project work photos, diagram of all areas revegetated and the planting methods and plants used, and an assessment of the success of the revegetation program in the annual monitoring report as required under the Order.

Erosion Control

33. Erosion control and sediment detention devices and materials shall be incorporated into the cleanup/restoration work design and installed prior to the end of project work and before the beginning of the rainy season. Any continuing, approved project work conducted after October 15 shall have erosion control works completed up-to-date and daily.

34. Erosion control materials shall be, at minimum, stored on-site at all times during approved project work between May 1 and October 15.
35. Approved project work within the 5-year flood plain shall not begin until all temporary erosion controls (straw bales or silt fences that are effectively keyed-in) are installed downslope of cleanup/restoration activities.
36. Non-invasive, non-persistent grass species (e.g., barley grass) may be used for their temporary erosion control benefits to stabilize disturbed slopes and prevent exposure of disturbed soils to rainfall.
37. Upon work completion, all exposed soil present in and around the cleanup/restoration sites shall be stabilized within 7 days.
38. Soils exposed by cleanup/restoration operations shall be seeded and mulched to prevent sediment runoff and transport.

Miscellaneous

39. During temporary stream crossing siting, locations shall be identified where erosion potential is low. Areas where runoff from roadway side slopes will spill into the side slopes of the crossing shall be avoided.
40. Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a waterbody where wetland vegetation, riparian vegetation, or aquatic organisms may be impacted.
41. Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble shall be removed upon completion of project activities.
42. Avoidance of earthwork on steep slopes and minimization of cut/fill volumes, combined with proper compaction, shall occur to ensure the area is resilient to issues associated with seismic events and mass wasting. If cracks are observed, or new construction is anticipated, consultation with a qualified professional is appropriate.
43. Operations within the 100-year floodplain shall be avoided. Refuse and spoils shall not be stored within the hundred-year floodplain. If roads are located within the 100-year floodplain, they shall be at grade; bridges shall have vented approaches and bridge deck shall be above anticipated 100-year flood water surface elevations. Consultation with a qualified professional is required for project work within the floodplain. .
44. Project work-related dust shall be controlled. Dust control activities shall be conducted in such a manner that will not produce sediment-laden runoff. Dust control measures, including pre-watering of excavation/grading sites, use of water trucks, track-out prevention, washing down vehicles/equipment before leaving site, and prohibiting grading/excavation activities during windy periods, shall be implemented as appropriate.

45. Short term impacts from project work-related emissions can be minimized via retrofitting equipment and use of low emissions vehicles when possible.
46. Position vehicles and other apparatus so as to not block emergency vehicle access.

B. BMPs for Specific Activities

Critical Area Planting, Channel Vegetation and Restoration and Management of Declining Habitats

The following measures shall be employed:

47. Plant materials used shall be native to the site and shall be locally collected if possible.
48. Straw mulch shall be applied at a rate of 2 tons per acre of exposed soils and, shall be secured to the ground.
49. When implementing or maintaining a critical area planting above the high water line, a filter fabric fence, straw wattles, fiber rolls and/or hay bales shall be utilized to keep sediment from flowing into the adjacent water body.

Structure for Water Control and Stream Crossings

These practices shall be used generally to replace or retrofit existing culverts and to install culverts where water control is needed at a stream crossing or road ditch to restore natural hydrology, and to reduce potential diversions and road-related erosion. In addition to the general limitations set forth in the previous section, the following measures shall be employed for these types of projects:

50. Culvert fill slopes shall be constructed at a 2:1 slope or shall be armored with rock.
51. All culverts in fish-bearing streams and in streams where fish have historically been found and may potentially re-occur, shall be designed and constructed consistent with NMFS Southwest Region's Guidelines for Salmonid Passage at Stream Crossings (NMFS 2000) and CDFG's Culvert Criteria for Fish Passage (CDFG 2002).

Limitations on Work in Streams and Permanently Ponded Areas

52. If it is necessary to conduct work in or near a live stream, the work space shall be isolated to avoid project activities in flowing water.
53. Water shall be directed around the work site.
54. Ingress/egress points shall be utilized and work shall be performed from the top of the bank to the maximum extent possible.
55. Use of heavy equipment in a channel shall be avoided or minimized. Please refer to BMPs 57 through 64 for dewatering of live streams. The amount of time construction equipment is stationed, working or traveling within the creek bed shall be minimized.

56. If the substrate of a seasonal pond, creek, stream or water body is altered during work activities, it shall be returned to approximate pre-construction conditions after the work is completed.

Temporary Stream Diversion and Dewatering: All Live Streams

57. For project work in a flowing or pooled stream or creek reach, or where access to the stream bank from the channel bottom is necessary, the work area shall be isolated with the use of temporary cofferdams upstream and downstream of the work site and all flowing water shall be diverted around the work site throughout the project period.
58. Other approved water diversion structures shall be utilized if installation of cofferdams is not feasible.
59. Cofferdam construction using offsite river-run gravel and/or sand bags is preferred. If gravel materials for cofferdams are generated onsite, measures shall be taken to ensure minimal disturbance to the channel, such as careful extraction from elevated terraces. The upstream end of the upstream cofferdam shall also be reinforced with thick plastic sheeting to minimize leakage.
60. Gravity diversions are preferred to pumping as dewatering techniques. If pumping is required to supplement gravity diversions, care shall be taken to minimize noise pollution and prevent the pump or generator-borne pollution to the watercourse.
61. The diversion pipe shall consist of a large plastic HDPE or ADS pipe or similar material, of a sufficient diameter to safely accommodate expected flows at the site during the full project period.
62. The pipe shall be protected from project activities to ensure that bypass flows are not interrupted.
63. Continuous flow downstream of the work site shall be maintained at all times during project work.
64. When project work is complete, the flow diversion structure shall be removed in a manner that allows flow to resume with a minimum of disturbance to the substrate.

Protection of Sensitive Species

65. Sensitive species - Consult with federal, state and local agencies regarding location of rare, threatened or endangered species.
66. Prior to commencing work, designate and mark a no-disturbance buffer to protect sensitive species and communities.
67. All work performed within waters of the state shall be completed in a manner that minimizes impacts to beneficial uses and habitat. Measures shall be employed to minimize land disturbances that shall adversely impact the water quality of waters of the state. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete Project implementation.

68. All equipment, including but not limited to excavators, graders, barges, etc., that may have come in contact with extremely invasive animals (e.g. zebra mussels or new Zealand mud snails) or plant (e.g., Arundo donax, scotch broom, pampas grass) or the seeds of these plants, shall be carefully cleaned before arriving on site and shall also be carefully cleaned before removal from the site, to prevent spread of these plants.
69. Vegetation shall be established on disturbed areas with an appropriate mix of California native plants and/or seed mix. All initial plantings and seed shall be installed prior to completion of the project work.

III. BMPs for Site Maintenance and Operations (per standard conditions)

The following BMPs are intended to address compliance with the standard conditions. Individual or multiple BMPs may be selected to address compliance with a given standard condition depending on site-specific conditions. BMPs are considered enforceable conditions as applicable to a given site.

A. Site Maintenance, Erosion Control, Drainage Features

70. Drainage of roads, clearings, fill prisms, and terraced areas is critical to ensuring their integrity and to prevent or minimize sediment discharges to watercourses. Proper design and location of roads and other features is critical to ensuring that a road or other feature be adequately drained and is best accomplished through consultation with a qualified professional. If inspection identifies surface rills or ruts, surfacing and drainage likely needs maintenance.
71. Surfacing of exposed/disturbed/bare surfaces can greatly reduce erosion associated with runoff. BMP features such as vegetative ground cover, straw mulch, slash, wood chips, straw wattles, fiber rolls, hay bales, geotextiles, and filter fabric fences may be combined and implemented on exposed/disturbed/bare surfaces as appropriate to prevent or minimize sediment transport and delivery to surface waters. Non-invasive, non-persistent grass species (e.g. barley grass) may be used for their temporary erosion control benefits to stabilize bare slopes and prevent exposure of bare soils to rainfall. If utilized, straw mulch shall be applied at a rate of 2 tons per acre of exposed soils and, if warranted by site conditions, shall be secured to the ground. Consultation with a qualified professional is recommended for successful site-specific selection and implementation of such surface treatments. Guidance literature pertaining to such BMPs is referenced in section IV. of this document.
72. Road surfacing, especially within a segment leading to a watercourse, is critical to prevent and minimize sediment delivery to a watercourse and maintain road integrity for expected uses. Road surfacing can include pavement, chip-seal, lignin, rock, or other material appropriate for timing and nature of use. Steeper sections of road require higher quality rock (e.g. crushed angular versus river-run) to remain in place.

73. Road shaping to optimize drainage includes out-sloping and crowning; shaping can minimize reliance on inside ditches. Drainage structures can include rolling dips and water bars within the road surface and ditch-relief culverts to drain inside ditches. Adequate spacing of drainage structures is critical to reduce erosion associated with runoff. Generally speaking, steep slopes require greater frequency of drainage structures. The drainage structures shall be maintained to ensure capture of and capacity for expected flow. The outlets of the structures shall be placed in such a manner as to avoid discharge onto fill, unstable areas, or areas that can enter a watercourse. If site conditions prohibit drainage structures at an adequate interval to avoid erosion, bioengineering techniques² are the preferred solution (e.g. live fascines), but other techniques may also be appropriate including armoring (i.e. rock of adequate size and depth to remain in place under traffic and flow conditions) and velocity dissipaters (e.g. gravel-filled “pillows” in an inside ditch to trap sediment). In the case that inside ditches need maintenance, grade ditches only when and where necessary, since frequent routine mechanical grading can cause erosion of the ditch, undermine banks, and expose the toe of the cutslope to erosion. Do not remove more leaves and vegetation than necessary to keep water moving, as vegetation prevents scour and filters out sediment.
74. Road drainage shall be discharged to a stable location away from a watercourse. Use sediment control devices, such as check dams, sand/gravel bag barriers, and other acceptable techniques, when it is neither practical nor environmentally sound to disperse ditch water immediately before the ditch reaches a stream. Within areas with potential to discharge to a watercourse (i.e. within riparian areas of at least 200 feet of a stream) road surface drainage shall be filtered through vegetation, slash, or other appropriate material or settled into a depression with an outlet with adequate drainage. Caution should always be exercised with catchment basins in the event of failure.
75. Any spoils associated with site maintenance shall be placed in a stable location where it cannot enter a watercourse. Sidecasting shall be minimized and shall be avoided on unstable areas or where it has the potential to enter a watercourse.
76. Do not sidecast when the material can enter the stream directly or indirectly as sediment. Sidecast material can indirectly enter the stream when placed in a position where rain or road runoff can later deliver it to a channel that connects with the stream.
77. Disconnect road drainage from watercourses (drain to hill slopes), install drainage structures at intervals to prevent erosion of the inboard ditch or gull formation at the hill slope outfall, outslope roads.

² A Primer on Stream and River Protection for the Regulator and Program Manager: Technical Reference Circular W.D. 02-#1, San Francisco Bay Region, California Regional Water Quality Control Board (April 2003) http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stream_wetland/streamprotectionircular.pdf

78. Ditch-relief culverts shall also be inspected regularly, and cleared of debris and sediment. To reduce plugging, 15 to 24-inch diameter pipes shall be the minimum size considered for ditch relief culverts and shall be informed by site-specific conditions.
79. Grade ditches only when and where necessary, since frequent routine mechanical grading can cause erosion of the ditch, undermine banks, and expose the toe of the cutslope to erosion. Do not remove more grass and weeds than necessary to keep water moving, as vegetation prevents scour and filters out sediment.
80. Use sediment control devices, such as check dams, sand/gravel bag barriers, and other acceptable techniques, when it is neither practical nor environmentally sound to disperse ditch water immediately before the ditch reaches a stream.

B. Stream Crossing Maintenance

81. Proper maintenance of stream crossings is critical to ensure support of beneficial uses of water. Regular inspection and maintenance is necessary to identify, in a timely manner, if problems are occurring. Crossings include rock fords³, armored fills with culverts³, and bridges³.
82. Rock fords are appropriate when temporary and minor moisture or over-land flow is expected, not typically when a bed and bank is present; exceptions may be justified if warranted by site specific conditions. Additionally, rock fords are appropriate if aquatic life is not present. An adequate layer of crushed angular rock shall be maintained at rock fords such that soil compaction is minimized under expected traffic levels.
83. Stream crossings consisting of armored fills with culverts and bridges are appropriate for streams with defined bed and bank². They shall be sized to ensure the 100-year streamflow event can pass unimpeded. Additionally, crossings shall allow migration of aquatic life during all life stages potentially supported by that stream reach; water depth and velocity can inhibit migration of adult and juvenile fish species.
84. Stream crossing design and installation is best accomplished with the assistance of a qualified professional. Site conditions can change over time (e.g. channel filling or incision); consultation with a qualified professional is appropriate to evaluate maintenance or replacement needs and opportunities.
85. Regular inspection of the stream crossing is appropriate to identify changed conditions within the stream channel (e.g., bank erosion, headward incision, and channel filling).
 - If large wood is accumulated upstream or within the crossing that could impede or deflect flow and result in erosion or debris capture, the wood

³ Explanation of term, available within the following document (as of the date of the Order):
http://www.pacificwatershed.com/sites/default/files/handbook_chapter_download_page.pdf

- should generally be removed. In some cases, it may be appropriate to re-orient debris with the streamflow.
- If sediment or debris is accumulated within a culvert and limits flow capacity, the short term solution should generally be to clean out the culvert and place the debris and sediment in a stable location with no potential to discharge into a stream. In some cases a trash rack, post, or other deflection structure at the culvert inlet can reduce plugging.
 - If sediment is accumulated in a culvert without other debris accumulation and limits flow capacity, the long term solution may generally involve changing the culvert's slope, diameter, or embedment in the streambed.
86. The roadway adjacent to and over the crossing is an area of potential discharge. All road surfaces approaching a crossing shall be drained before the crossing, adequately filtered through vegetation or other material, and not discharged to a watercourse. If turbid water is discharged at a stream crossing, additional measures to control erosion at the source(s) or to remove sediment prior to discharge shall be implemented. Road surfaces shall be of rock, pavement, or other material appropriate for type and level of use.
87. If a culvert is used, the approaches and fill slopes shall be properly compacted during installation and shall be stabilized with rock or other appropriate surface protection to minimize surface erosion and slumping to the receiving waters. If possible, the road surface over the culvert shall have a critical-dip to ensure that if the culvert becomes plugged, water can flow over the road surface without washing away the fill prism. If site-specific conditions do not allow for a critical dip, alternatives such as emergency overflow culverts, oversized culverts, flared inlets, and debris racks may be warranted.

C. Riparian and Wetland Protection and Management:

88. Buffer width will be in compliance with Tier category.
89. Trees within riparian areas shall be retained for natural recruitment to streams. Large woody debris (LWD) shall be retained in stream or within riparian areas. The size of wood that can be beneficial to the stream will vary depending on the size of the stream (i.e., larger pieces of wood are necessary to withstand flows in large streams). In the event that LWD or trees are disturbed during excavation, care shall be taken to separate the LWD from soil. The pieces shall be stockpiled separately until they can be replaced in appropriate locations to enhance instream or riparian conditions. Placement of instream wood for habitat enhancement should be done under the consultation of a qualified professional and in conformance with applicable regulatory permits.
90. Avoidance of disturbance in riparian areas (within 200 feet of a watercourse) should result in protection and restoration of the quality/health of the riparian stand so as to promote: 1) shade and microclimate controls; 2) delivery of wood to channels, 3) slope stability and erosion control, 4) ground cover, and 5) removal of excess nutrients. This recognizes the importance of the riparian zone

with respect to temperature protection, sediment delivery, its importance with respect to the potential for recruitment of large wood, and removal of nutrients transported in runoff. In the event that past disturbance has degraded riparian conditions, replanting with native species capable of establishing a multi-storied canopy will ensure these riparian areas can perform these important ecologic functions.

D. Spoils Management

To ensure spoil pile stability and to reduce the potential for spoil pile slope failure or transport to waters of the state, the following measures shall be implemented when placing or disposing of spoils onsite:

91. Rip compacted soils prior to placing spoils to prevent the potential for ponding under the spoils that could result in spoil site failure and subsequent sedimentation;
92. Compact and contour stored spoils to mimic the natural slope contours and drainage patterns to reduce the potential for fill saturation and failure;
93. Ensure that spoil materials are free of woody debris, and not placed on top of brush, logs or trees.
94. Spoils shall not be placed or stored in locations where soils are wet or unstable, or where slope stability could be adversely affected.
95. Do not locate spoil piles in or immediately adjacent to wetlands and watercourses.
96. Store spoil piles in a manner (e.g. cover pile with plastic tarps and surround base of pile with straw wattle) or location that would not result in any runoff from the spoil pile ending up in wetlands and watercourses.
97. Separate organic material (e.g., roots, stumps) from the dirt fill and store separately. Place this material in long-term, upland storage sites, as it cannot be used for fill.
98. Keep temporary disposal sites out of wetlands, adjacent riparian corridors, and ordinary high water areas as well as high risk zones, such as 100-year floodplain and unstable slopes.
99. After placement of the soil layer, track walk the slopes perpendicular to the contour to stabilize the soil until vegetation is established. Track walking creates indentations that trap seed and decrease erosion of the reclaimed surfaces.
100. Revegetate the disposal site with a mix of native plant species. Cover the seeded and planted areas with mulched straw at a rate of 2 tons per acre. Apply jute netting or similar erosion control fabric on slopes greater than 2:1 if site is erosive.

E. Water Storage and Use

WATER USE

101. Conduct operations on a size and scale that considers available water sources and other water use and users in the planning watershed.
102. Implement water conservation measures such as rainwater catchment systems, drip irrigation, mulching, or irrigation water recycling. (Also see BMPs for Irrigation, below)
103. Take measures to minimize water diversion during low flow periods.
104. Options for documentation of water diversions and/or water usage may include the use of water meter devices and date-stamped photographs of water meter readings.
105. Hauled water utilized for irrigation shall be documented via receipt or similar, and show the date, name, and license plate of the water hauler, and the quantity of water purchased.
106. Apply water at agronomic rates (do not overwater plants).

WATER STORAGE

107. If using a water storage tank, do not locate the tank in a flood plain or next to equipment that generates heat. Locate the tank so it is easy to install, access, and maintain.
108. Vertical tanks should be installed according to manufacturer's specifications and placed on firm, compacted soil that is free of rocks/sharp objects and capable of bearing the weight of the tank and its maximum contents. In addition, a sand or pea gravel base with provisions for preventing erosion is highly recommended. Installation sites for tanks 8,000 gallons or more must be on a reinforced concrete pad providing adequate support and enough space to attach a tank restraint system (anchor using the molded-in tie down lugs with moderate tension, being careful not to over-tighten), especially where seismic or large wind forces are present.
109. Horizontal tanks shall be secured with bands and/or hoops to prevent tank movement.
110. Design and construct storage ponds in properly sited locations, off-stream. Plant vegetation along the perimeter of the pond. Construct berms or excess freeboard space around the perimeter of the pond to allow for sheet flow inputs.
111. Provide adequate outlet drainage for overflow of ponds, including low impact designs, to promote dispersal and infiltration of flows.
112. Place proper lining or sealing in ponds to prevent water loss.

113. Storage bladders are not encouraged for long term water storage reliability. If they are utilized, ensure that they are designed to store water, and that they are sited to minimize potential for water to flow into a watercourse in the event of a catastrophic failure. Used bladders (e.g. military surplus bladders) shall be checked for interior residual chemicals and integrity prior to use. Inspect bladder and containment features periodically to ensure integrity.

F. Irrigation Runoff

114. Irrigate at rates to avoid or minimize runoff.
115. Regularly inspect for leaks in mains and laterals, in irrigation connections, or at the ends of drip tape and feeder lines. Repair any found leaks.
116. Design irrigation system to include redundancy (i.e., safety valves) in the event that leaks occur, so that waste of water is prevented and minimized.
117. Recapture and reuse irrigation runoff (tailwater) where possible, through passive (gravity-fed) or active (pumped) means.
118. Construct retention basins for tailwater infiltration; percolation medium may be used to reduce pollutant concentration in infiltrated water. Constructed treatment wetlands may also be effective at reducing nutrient loads in water. Ensure that drainage and/or infiltration areas are located away from unstable or potentially unstable features.
119. Regularly replace worn, outdated or inefficient irrigation system components and equipment.
120. Use mulches (e.g. wood chips or bark) in cultivation areas that do not have ground cover to prevent erosion and minimize evaporative loss.
121. Leave a vegetative barrier along the property boundary and interior watercourses to act as a pollutant filter.
122. Employ rain-triggered shutoff devices to prevent irrigation after precipitation.

G. Fertilizers, Soil Amendments, Pesticides, Petroleum Products, and Other Chemicals

123. Evaluate irrigation water, soils, growth media, and plant tissue to optimize plant growth and avoid over-fertilization.
124. Reference Department of Pesticide Regulations Guidance (see Attachments E-1 and E-2 of Order No. R1-2015-0023)
125. All chemicals shall be stored in a manner, method, and location that ensures that there is no threat of discharge to waters of the state.
126. Products shall be labeled properly and applied according to the label.
127. Use integrated pest management strategies that apply pesticides only to the area of need, only when there is an economic benefit to the grower, and at times when runoff losses are least likely, including losses of organic matter from dead plant material.

128. Periodically calibrate pesticide application equipment.
129. Use anti-backflow devices on water supply hoses, and other mixing/loading practices designed to reduce the risk of runoff and spills.
130. Petroleum products shall be stored with a secondary containment system.
131. Throughout the rainy season, any temporary containment facility shall have a permanent cover and side-wind protection, or be covered during non-working days and prior to and during rain events.
132. Materials shall be stored in their original containers and the original product labels shall be maintained in place in a legible condition. Damaged or otherwise illegible labels shall be replaced immediately.
133. Bagged and boxed materials shall be stored on pallets and shall not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials shall be covered during non-working days and prior to rain events.
134. Have proper storage instructions posted at all times in an open and conspicuous location.
135. Prepare and keep onsite a Spill Prevention, Countermeasures, and Cleanup Plan (SPCC Plan) if applicable⁴.
136. Keep ample supply of appropriate spill clean-up material near storage areas.

H. Cultivation-Related Wastes

137. Cultivation-related waste shall be stored in a place where it will not enter a stream. Soil bags and other garbage shall be collected, contained, and disposed of at an appropriate facility, including for recycling where available. Pots shall be collected and stored where they will not enter a waterway or create a nuisance. Plant waste and other compostable materials be stored (or composted, as applicable) 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 groundwaters.
138. Imported soil for cultivation purposes shall be minimized. The impacts associated with importation of soil include, but are not limited to increased road maintenance and the increased need for spoils management. Use of compost increases the humic acid content and water retention capacity of soils while reducing the need for fertilizer application. In the event that containers (e.g. grow bags or grow pots) are used for cultivation, reuse of soil shall be maximized to the extent feasible.

⁴ SPCC plans are required for over 1,320 gallons of petroleum stored aboveground or 42,000 gallons below ground. Additionally, any type of storage container requires an SPCC if it is larger than 20,000 gallons, or if the cumulative storage capacity on-site exceeds 100,000 gallons (Health and Safety Code section 25270-25270.13) A sample SPCC can be found here: <http://www.calcupa.net/civica/filebank/blobdload.asp?BlobID=3186>

139. Spent growth medium (i.e. soil and other organic medium) shall be handled to minimize discharge of soil and residual nutrients and chemicals to watercourses. Proper handling of spent soil could include incorporating into garden beds, spreading on a stable surface and revegetation, storage in watertight dumpsters, covering with tarps or plastic sheeting prior to proper disposal, and use of techniques to reduce polluted runoff described under Item F. Irrigation Runoff.
140. Other means of handling cultivation-related waste may be considered on a site-specific basis.

I. Refuse and Human Waste

141. Trash containers of sufficient size and number shall be provided and properly serviced to contain the solid waste generated by the project. Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers. Use lined bins or dumpsters to reduce leaking of liquid waste. Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater. Make sure trash container areas are screened or walled to prevent off-site transport of trash. Consider using refuse containers that are bear-proof and/or secure from wildlife. Refuse shall be removed from the site on a frequency that does not result in nuisance conditions, transported in a manner that they remain contained during transport, and the contents shall be disposed of properly at a proper disposal facility.
142. Ensure that human waste disposal systems do not pose a threat to surface or ground water quality or create a nuisance. Onsite treatment systems should follow applicable County ordinances for human waste disposal requirements, consistent with the applicable tier under the State Water Resources Control Board Onsite Waste Treatment System Policy⁵.

⁵ Available at: http://www.waterboards.ca.gov/water_issues/programs/owts/docs/owts_policy.pdf (as of the date of the Order).

IV. References

Handbook for Forest, Ranch, & Rural Roads: A Guide for Planning, Designing, Constructing, Reconstructing, Upgrading, Maintaining, and Closing Wildland Roads
http://www.pacificwatershed.com/sites/default/files/handbook_chapter_download_page.pdf

A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds
<http://www.5counties.org/roadmanual.htm>

Construction Site BMP Fact Sheets
<http://www.dot.ca.gov/hq/construc/stormwater/factsheets.htm>

EPA Riparian/Forested Buffer
<http://water.epa.gov/polwaste/npdes/swbmp/Riparian-Forested-Buffer.cfm>

Creating Effective Local Riparian Buffer Ordinances
http://www.rivercenter.uga.edu/publications/pdf/riparian_buffer_guidebook.pdf

How to Install Residential Scale Best Management Practices (BMPs) in the Lake Tahoe Basin
<http://www.tahoebmp.org/Documents/Contractors%20BMP%20Manual.pdf>

Spoil Pile BMPs
http://michigan.gov/documents/deq/deq-wb-nps-sp_250905_7.pdf

Sanctuary Forest Water Storage Guide
http://agwaterstewards.org/images/uploads/docs/1213661598_Water_Storage_Guide.pdf

Natural Resources Conservation Service-USDA, "Ponds – Planning, Design, Construction", Agriculture Handbook
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_030362.pdf

Division of Safety of Dams size requirements
<http://www.water.ca.gov/damsafety/jurischart/>

Water Tanks: Guidelines for Installation and Use
http://dnn7.snydernet.com/_pdf/_septic/Septic%20Catalog%202010.pdf

BEST MANAGEMENT PRACTICES (BMP's) University of California Cooperative Extension
http://www.waterboards.ca.gov/sandiego/water_issues/programs/wine_country/docs/updates081910/ucce_bmps.pdf

California Stormwater Quality Association
Section 4: Source Control BMPs
<https://www.casqa.org/sites/default/files/BMPHandbooks/sd-12.pdf>

CA DOT Solid Waste Management Plan
<http://www.dot.ca.gov/hq/construc/stormwater/WM-05.pdf>

State Water Resources Control Board Onsite Wastewater Treatment System (OWTS) policy
http://www.waterboards.ca.gov/water_issues/programs/owts/docs/owts_policy.pdf

California Stormwater Quality Association

Section 4: Source Control BMPs

<https://www.casqa.org/sites/default/files/BMPHandbooks/sd-32.pdf>

California Riparian Habitat Restoration Handbook

http://www.conservation.ca.gov/dlrp/watershedportal/InformationResources/Documents/Restoration_Handbook_Final_Dec09.pdf

The Practical Streambank Bioengineering Guide

http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/idpmcpu116.pdf

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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 catch any problems that might arise and to monitor the effectiveness of corrective actions which are implemented. Refer to Figure 2 for the location of site specific monitoring points 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, 10 Monitoring Points (MPs) have been identified. Monitoring Points #1 through #2 focus on site maintenance, erosion control and drainage features related to stream crossings. MP #3 deals with cultivation related spoils and wastes, including a shredding site and a compost pile. MP #4-6 related to the cultivation areas on the Project Site. MP #7 relates to nutrient storage sheds, and the observed lack of secondary containment therein. MP #8 addresses proper storage procedures for petroleum products. MP # 9 addresses two (2) pit toilets on the Project Site, and finally MP #10 addresses a small flatcar bridge spanning a small Class II watercourse (SC #3) adjacent to CA #3.

The goal of the monitoring on this Project Site is to ensure the original problems or non-compliant features (e.g., fuel tanks and generators without secondary containment; under-designed stream crossings, 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 <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.

Photo Log of features of interest and monitoring points before, during, and/or after treatment					
Photo #	Monitoring Point	Standard Condition	Date	Pre-, during, or post-treatment	Description
1	MP #1	4.1	08/03/17	Pre -	Road Surface Discharge Point (RSDP) #1- view of hydrologically connected road segment of un-rocked inboard ditch to Stream Crossing (SC) #1 (MP #1) on Class II watercourse
2	MP #2	4.1	08/03/17	Pre -	Road Surface Discharge Point (RSDP) #2- view of left and right road approach ditches draining road to a Class III watercourse at SC #2
3	MP #1	4.2	08/03/17	Pre-	View of 36 inch diameter cmp inlet at SC #1. Culvert is undersized for the 100 year storm flow event, and is partially plugged with small woody debris
4	MP #1	4.2	08/03/17	Pre-	View of SC #1 inlet from upstream of culvert inlet.
5	MP #1	4.2	08/03/17	Pre-	SC #1 view of culvert outlet. Culvert is set high in the fill, and is significantly rusted. Rust damage has eaten completely through at bottom near outlet. Heavily rocked scour pool is present below outlet, plunge from bottom of culvert to plunge pool measured 4 feet. Undermining of culvert was noted.
6	MP #2	4.2	08/03/17	Pre-	SC #2- view looking downstream at heavily vegetated inlet of 24-inch diameter steel culvert on a Class III watercourse. PWA scientist pictured standing at culvert inlet.

Photo Log of features of interest and monitoring points before, during, and/or after treatment					
Photo #	Monitoring Point	Standard Condition	Date	Pre-, during, or post-treatment	Description
7	MP #2	4.2	08/03/17	Pre-	View looking downstream at torn outlet. Seasonal flow outlets through heavy vegetation. A 4 foot plunge was measured at the outlet. Undermining may be present, but was not observed due to inaccessibility.
8	MP #2	4.2	08/03/17	Pre-	SC #2- view of channel, looking upslope at the outboard fill of the road. Dense brush and heavy vegetation obscure culvert outlet and channel.
9	MP #3	4.4	08/03/17	Pre-	View of compost pile located in the middle and south-west of CA #3. Piles of soil, mulch, and shredded plant material are staged and composted, being re-amended to the cultivation areas each season. Cultivation areas is on large flat, no threat of delivery or transport to any watercourse was identified. No evidence of runoff was noted. Recommendations for straw wattles and covering were given to landowner.
10	MP #3	4.4	08/03/17	Pre-	View of mulched soil pile in north west corner of CA #2. No evidence of transport or delivery were noted, no watercourses are located nearby. Soil is slated to be re-used in following rotations after being transported to compost site and re-amended.
11	MP #3	4.4	08/03/17	Pre-	View of wood chipper and shredding site near CA #2. Organic material is shredded and then taken to Compost Pile in CA #3 for soil re-amendment.
12		4.5	08/03/17	Pre-	View of drip line irrigation, and raised beds as water conservation measures. Representative of all Cultivation Areas
13		4.5	08/03/17	Pre-	View of Tank farm (7 x 5,000 gallon, and 1 x 5,000 gallon behind others) storage tanks located east of CA #1.

Photo Log of features of interest and monitoring points before, during, and/or after treatment					
Photo #	Monitoring Point	Standard Condition	Date	Pre-, during, or post-treatment	Description
14		4.5	08/03/17	Pre-	View of in-ground planted cannabis garden, showing wetted area post irrigation. No evidence of irrigation runoff or overwatering was observed.
15		4.5	08/03/17	Pre-	View of Well #1, registered with the California State Division of Water Rights.
16		4.5	08/03/17	Pre-	View of Well #2, registered with the California State Division of Water Rights.
17	MP #7	4.7	08/03/17	Pre-	View of nutrient storage container (Plastic shed). Adequate cover is provided, but secondary containment is not. One gas can was observed in this storage facility, landowner was advised and aware of issue present.
18		4.9	08/03/17	Pre-	View of small petroleum containers being housed under a covered wood shed. Adequate secondary containment was provided.
19		4.9	08/03/17	Pre-	View of backup generator with adequate covering. This unit is used for emergencies only.
20	MP #8	4.9	08/03/17	Pre	View of an uncontained and uncovered petroleum container next to a farm tractor.
21	MP #9	4.11	08/03/17	Pre-	View of a pit toilet located upslope and east of Country Lane.

Photo Log of features of interest and monitoring points before, during, and/or after treatment					
Photo #	Monitoring Point	Standard Condition	Date	Pre-, during, or post-treatment	Description
22	MP #9	4.11	08/03/17	Pre-	View of a pit toilet located west of Country Lane.
23		4.11	08/03/17	Pre-	View of garbage collection area outside CA #1. Cans are labelled individually for “Trash” or “Recycling”, and are hauled off as necessary at bi-weekly intervals.
24	MP #10	4.2	08/03/17	Pre-	View of Flatcar bridge crossing at SC #3, as seen from right road approach.
25	MP #10	4.2	08/03/17	Pre-	View of Flatcar bridge spanning Class II watercourse, view looking downstream under bridge. Irrigation infrastructure seen in foreground above active channel banks.

Appendix C:

Photo Documentation of Monitoring Points

Appendix C: Photo Documentation of Monitoring Points

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



Photo #1, MP #1 – Road Surface Discharge Point (RSDP) #1- view of hydrologically connected road segment of un-rocked inboard ditch to Stream Crossing (SC) #1 (MP #1) on Class II watercourse (Photo August 2017).



Photo #2, MP #2 – Road Surface Discharge Point (RSDP) #2- view of left and right road approach ditches draining road to a Class III watercourse at SC #2 (MP #2) (Photo August 2017).

4.2 Standard Condition #2: Stream Crossing Maintenance



Photo #3, MP #1 – View of 36 inch diameter cmp inlet at SC #1. Culvert is undersized for the 100 year storm flow event, and is partially plugged with small woody debris. (Photo August 2017).



Photo #4, MP #1 – View of SC #1 inlet from upstream of culvert inlet. (Photo August 2017).



Photo #5, MP #1 –SC #1 view of culvert outlet. Culvert is set high in the fill, and is significantly rusted. Rust damage has eaten completely through at bottom near outlet. Heavily rocky scour pool is present below outlet, plunge from bottom of culvert to plunge pool measured 4 feet. Undermining of culvert was noted. (Photo August 2017).



Photo #6, MP #2 – SC #2- view looking downstream at heavily vegetated inlet of 24-inch diameter steel culvert on a Class III watercourse. PWA scientist pictured standing at culvert inlet. (Photo August 2017).



Photo #7, MP #2 –SC #2- View looking downstream at torn outlet. Seasonal flow outlets through heavy vegetation. A 4 foot plunge was measured at the outlet. Undermining may be present, but was not observed due to inaccessibility. (Photo August 2017).



Photo #8, MP #2 –SC #2- view of channel, looking upslope at the outboard fill of the road. Dense brush and heavy vegetation obscure culvert outlet and channel. (Photo August 2017).

4.4 Standard Condition #4. Spoils Management



Photo #9, MP #3 – View of compost pile located in the middle and south-west of CA #3. Piles of soil, mulch, and shredded plant material are staged and composted, being re-amended to the cultivation areas each season. Cultivation areas is on large flat, no threat of delivery or transport to any watercourse was identified. No evidence of runoff was noted. Recommendations for straw wattles and covering were given to landowner. (Photo August 2017).



Photo #10, MP #3 – View of mulched soil pile in north west corner of CA #2. No evidence of transport or delivery were noted, no watercourses are located nearby. Soil is slated to be re-used in following rotations after being transported to compost site and re-amended. (Photo August 2017).



Photo #11, MP #3 – View of shredder and shredding site near CA #2. Organic material is shredded and then taken to Compost Pile in CA #3 for soil re-amendment. (Photo August 2017).

4.5 Standard Condition #5. Water Storage and Use



Photo #12 – View of drip line irrigation, and raised beds as water conservation measures. Representative of all Cultivation Areas. (Photo August 2017).



Photo #13 - View of Tank farm (7 x 5,000 gallon, and 1 x 5,000 gallon behind others) storage tanks located east of CA #1. (Photo August, 2017)



Photo #14– View of in-ground planted cannabis garden, showing wetted area post irrigation. No evidence of irrigation runoff or overwatering was observed. (Photo August, 2017).



Photo #15 – View of Well #1, registered with the California State Division of Water Rights. (Photo August 2017).



Photo #16 – View of Well #2, registered with the California State Division of Water Rights. (Photo August 2017).

4.7 Standard Condition #7: Fertilizers and Soil Amendments



Photo #17, MP #7 – View of nutrient storage container (Plastic shed). Adequate cover is provided, but secondary containment is not. One gas can was observed in this storage facility, landowner was advised and aware of issue present. (Photo August 2017).

4.9 Standard Condition #9: Petroleum Products and other Chemicals



Photo #18 – View of small petroleum containers being housed under a covered wood shed. Adequate secondary containment was provided. (Photo August 2017).



Photo 19 – View of backup generator with adequate covering. This unit is used for emergencies only. A D.O.T. approved trailer is part of the structure of this mobile unit. As referred to in the containment section under 40 CFR 264.175(b), wherein the storage basin must be sufficient to hold 10% of the entire stored volume of hazardous materials, this generator is considered compliant with The Order. (Photo January 2017).



Photo 20, MP #8 – View of an uncontained and uncovered petroleum container next to a farm tractor. (Photo August 2017).

4.11 Standard Condition #11. Refuse and Human Waste



Photo 21, MP #9 – View of a pit toilet located upslope and east of Country Lane. (Photo August 2017).



Photo 22, MP #9 – View of a pit toilet located west of Country Lane. (Photo August 2017).



Photo 23 – View of garbage collection area outside CA #1. Not visible from view, cans are labelled “trash” and “recycling”. (Photo August 2017).

4.2 Standard Condition #2: Stream Crossing Maintenance

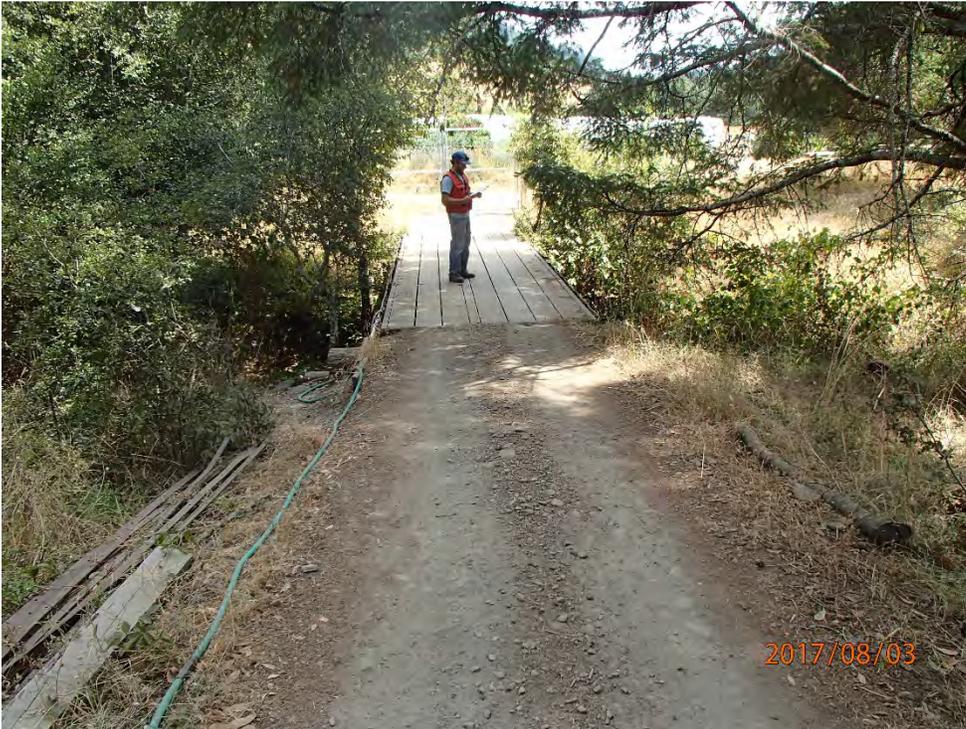


Photo 24; MP #10 – View of Flatcar bridge crossing at SC #3, from right road approach. (Photo August 2017).



Photo 25; MP #10 – View of Flatcar bridge spanning Class II watercourse, view looking downstream under bridge. Irrigation infrastructure seen in foreground above active channel banks. (Photo August 2017).

Appendix D1:
Water Diversion Log Sheet

Surface Water Diversion Log Sheet	WD ID:		PWA ID:				Watershed:					
	Location:						Sheet ___ of ___		Year:			
Source Name (circle gallons or acre feet)	Amount diverted per month (gallons or acre feet)											
	January	February	March	April	May	June	July	August	September	October	November	December
Stream diversion 1 (gallons/acre feet)												
Stream diversion 2 (gallons/acre feet)												
Stream diversion 3 (gallons/acre feet)												
Spring 1 (gallons/acre feet)												
Spring 2 (gallons/acre feet)												
Spring 3 (gallons/acre feet)												
Rainwater catchment (gallons/acre feet)												
Monthly Totals												
Comments:												

Surface Water Diversion Log Sheet	WD ID:		PWA ID:				Watershed:					
	Location:						Sheet ___ of ___		Year:			
Source Name (circle gallons or acre feet)	Amount diverted per month (gallons or acre feet)											
	January	February	March	April	May	June	July	August	September	October	November	December
Stream diversion 1 (gallons/acre feet)												
Stream diversion 2 (gallons/acre feet)												
Stream diversion 3 (gallons/acre feet)												
Spring 1 (gallons/acre feet)												
Spring 2 (gallons/acre feet)												
Spring 3 (gallons/acre feet)												
Rainwater catchment (gallons/acre feet)												
Monthly Totals												
Comments:												

Appendix D2:
Water Input to Storage Log Sheet

Water Input to Storage Log Sheet		WD ID:	PWA ID:	Watershed:	
	Location:			Sheet ___ of ___	Year:

Water Source (circle 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
Stream diversion 1 (gallons/acre feet)												
Stream diversion 2 (gallons/acre feet)												
Stream diversion 3 (gallons/acre feet)												
Spring 1 (gallons/acre feet)												
Spring 2 (gallons/acre feet)												
Spring 3 (gallons/acre feet)												
Well (gallons/acre feet)												
Rainwater catchment (gallons/acre feet)												
Water truck hauling (gallons/acre feet)												
Monthly Totals												

Comments:

Water Input to Storage Log Sheet		WD ID:	PWA ID:	Watershed:			
	Location:			Sheet ___ of ___		Year:	

Water Source (circle 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
Stream diversion 1 (gallons/acre feet)												
Stream diversion 2 (gallons/acre feet)												
Stream diversion 3 (gallons/acre feet)												
Spring 1 (gallons/acre feet)												
Spring 2 (gallons/acre feet)												
Spring 3 (gallons/acre feet)												
Well (gallons/acre feet)												
Rainwater catchment (gallons/acre feet)												
Water truck hauling (gallons/acre feet)												
Monthly Totals												

Comments:

Appendix D3:
Water Use by Source Log Sheet

Water Use by Source Log Sheet

WD ID:

PWA ID:

Watershed:

Location:

Sheet ___ of ___

Year:

Amount utilized from storage per month (gallons or acre feet), by type

Water Source (circle gallons or acre feet)	January	February	March	April	May	June	July	August	Sept	October	November	December
Stream diversion 1 (gallons/acre feet)												
Stream diversion 2 (gallons/acre feet)												
Stream diversion 3 (gallons/acre feet)												
Spring 1 (gallons/acre feet)												
Spring 2 (gallons/acre feet)												
Spring 3 (gallons/acre feet)												
Well (gallons/acre feet)												
Rainwater catchment (gallons/acre feet)												
Water truck hauling (gallons/acre feet)												
Monthly Totals												

Comments:

Water Use by Source Log Sheet

WD ID:

PWA ID:

Watershed:

Location:

Sheet ___ of ___

Year:

Amount utilized from storage per month (gallons or acre feet), by type

Water Source (circle gallons or acre feet)	January	February	March	April	May	June	July	August	Sept	October	November	December
Stream diversion 1 (gallons/acre feet)												
Stream diversion 2 (gallons/acre feet)												
Stream diversion 3 (gallons/acre feet)												
Spring 1 (gallons/acre feet)												
Spring 2 (gallons/acre feet)												
Spring 3 (gallons/acre feet)												
Well (gallons/acre feet)												
Rainwater catchment (gallons/acre feet)												
Water truck hauling (gallons/acre feet)												
Monthly Totals												

Comments:

Appendix E:
Fertilizer and Amendment Use Plan and Log Sheet

Fertilizer and Ammendment Application Log Sheet	WD ID:				PWA ID:			Watershed:		
								Year:		

Product name	Fertilizer or Ammendment (circle one)	Type (circle type)	Nutrient content (N-P-K ratio)	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 applied in this application (same units)	Date applied (Mo/Day)	Location (Cultivation area #, Greenhouse #, Hoophouse #, etc.)	Initials	Comments
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
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	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									

Appendix F1:
Pesticide-Herbicide Log Sheet

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							
	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							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							

Appendix F2:
Legal Pest Management Practices for Marijuana Growers
in California

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. Internatl. 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>Gliocladium 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 P. cannabis</i> (bhong aphid) vectors tobacco mosaic virus	Suck plant sap; weaken plants	<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 delineana</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"> Strip bark from stems to build nests Tunnel through planting areas; feed on plants; gnaw on irrigation lines 	<ul style="list-style-type: none"> Double wrap a 3'-tall chicken wire fence around plants Trap (minus rodenticides) Mount barn owl boxes 	Rodenticides (see footnote below)
roof rats , <i>Rattus rattus</i> wood rats , <i>Neotoma</i> spp.				
pocket gophers , <i>Thomomys</i> spp.				
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)

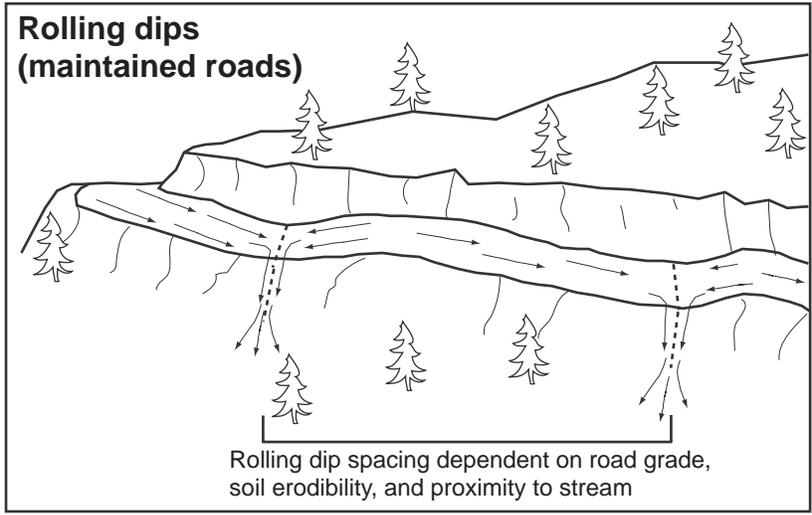
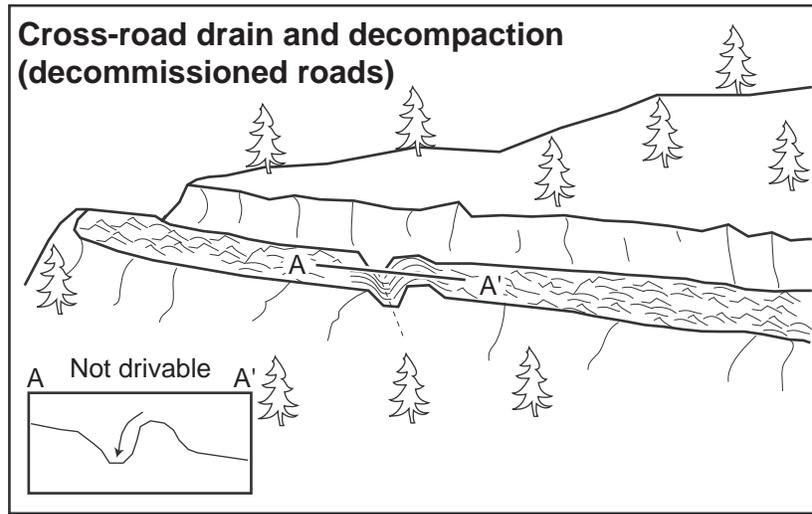
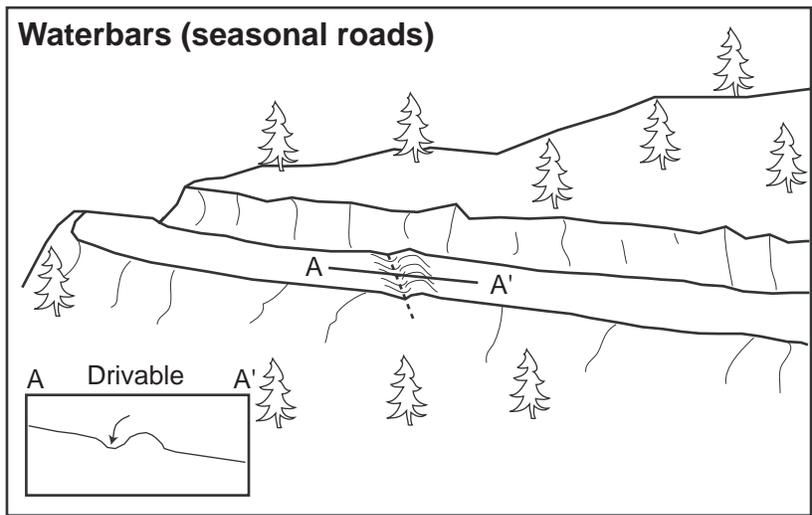
PEST	DAMAGE	IPM PRACTICES (monitoring; cultural, physical, mechanical, biological)	PESTICIDES
DISEASES			
powdery mildew <i>Sphaerotheca macularis</i>	Grow on leaves as white and gray powdery patches	<ul style="list-style-type: none"> Use fans to improve air circulation 	horticultural oil; neem oil; 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Disinfest cuttings before introducing to growing area Release predatory mites 	neem oil, horticultural oil, sulfur
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
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 Use biocontrol: <i>Encarsia formosa</i> 	azadirachtin, <i>Beauveria bassiana</i> , cinnamon oil, horticultural oil
thrips <i>Heliothrips haemorrhoidalis</i> , <i>Frankliniella occidentalis</i> , <i>Thrips tabaci</i>	Stipple leaves and vector viruses	<ul style="list-style-type: none"> Hang up yellow or blue sticky cards 	
dark-winged fungus gnats (Diptera: Sciaridae) <i>Bradysia</i> spp.	Damage roots and stunt plant growth	<ul style="list-style-type: none"> 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

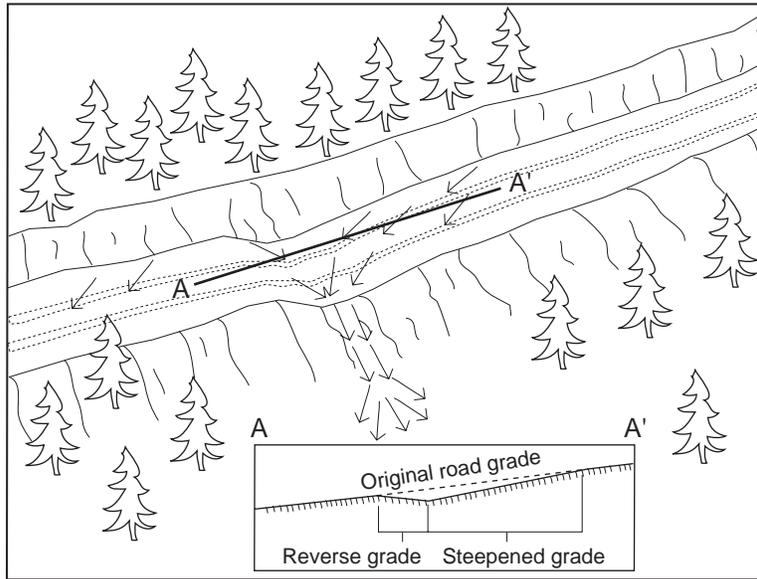
Typical Methods for Dispersing Road Surface Runoff with Waterbars, Cross-road Drains, and Rolling Dips



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Typical Road Surface Drainage by Rolling Dips



Rolling dip installation:

1. Rolling dips will be installed in the roadbed as needed to drain the road surface.
2. Rolling dips will be sloped either into the ditch or to the outside of the road edge as required to properly drain the road.
3. Rolling dips are usually built at 30 to 45 degree angles to the road alignment with cross road grade of at least 1% greater than the grade of the road.
4. Excavation for the dips will be done with a medium-size bulldozer or similar equipment.
5. Excavation of the dips will begin 50 to 100 feet up road from where the axis of the dip is planned as per guidelines established in the rolling dip dimensions table.
6. Material will be progressively excavated from the roadbed, steepening the grade until the axis is reached.
7. The depth of the dip will be determined by the grade of the road (see table below).
8. On the down road side of the rolling dip axis, a grade change will be installed to prevent the runoff from continuing down the road (see figure above).
9. The rise in the reverse grade will be carried for about 10 to 20 feet and then return to the original slope.
10. The transition from axis to bottom, through rising grade to falling grade, will be in a road distance of at least 15 to 30 feet.

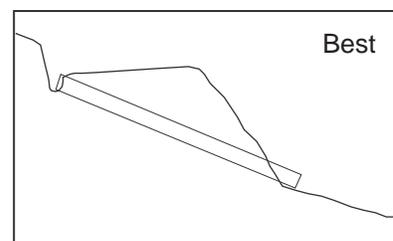
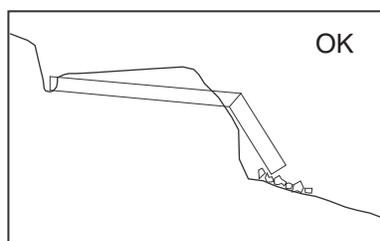
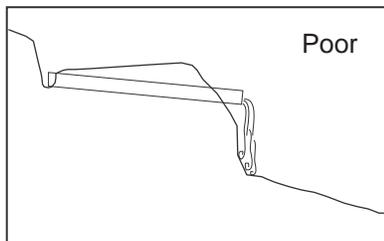
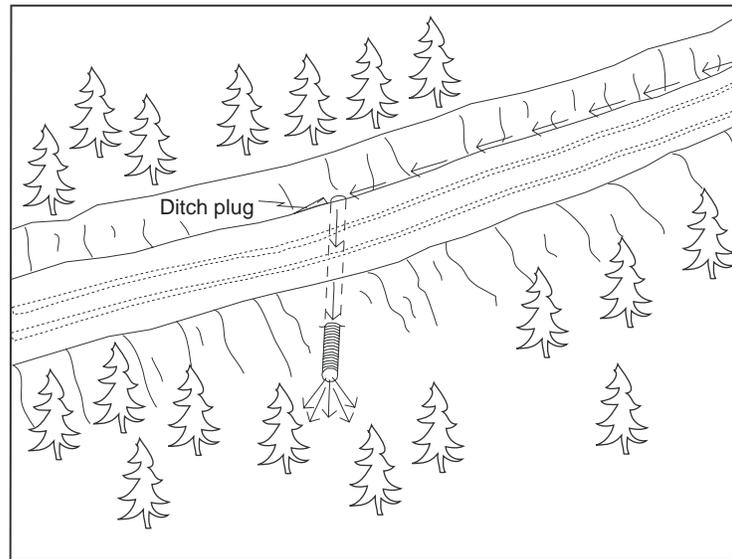
Table of rolling dip dimensions by road grade

Road grade %	Upslope approach distance (from up road start to trough) ft	Reverse grade distance (from trough to crest) ft	Depth at trough outlet (below average road grade) ft	Depth at trough inlet (below average road grade) ft
<6	55	15 - 20	0.9	0.3
8	65	15 - 20	1.0	0.2
10	75	15 - 20	1.1	0.01
12	85	20 - 25	1.2	0.01
>12	100	20 - 25	1.3	0.01

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Typical Ditch Relief Culvert Installation



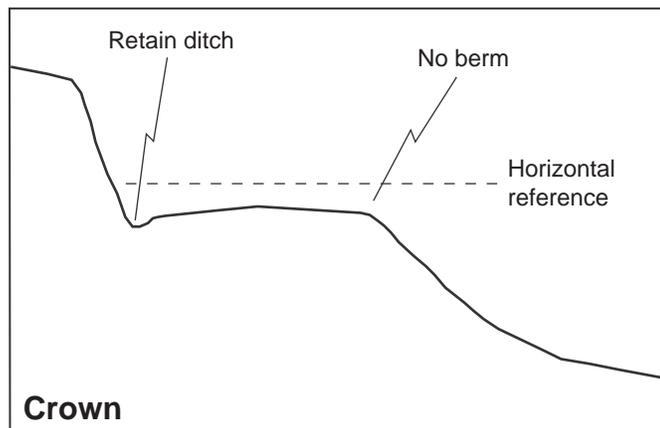
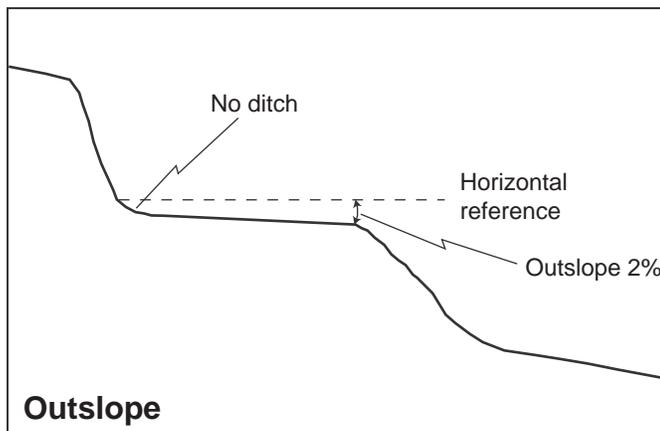
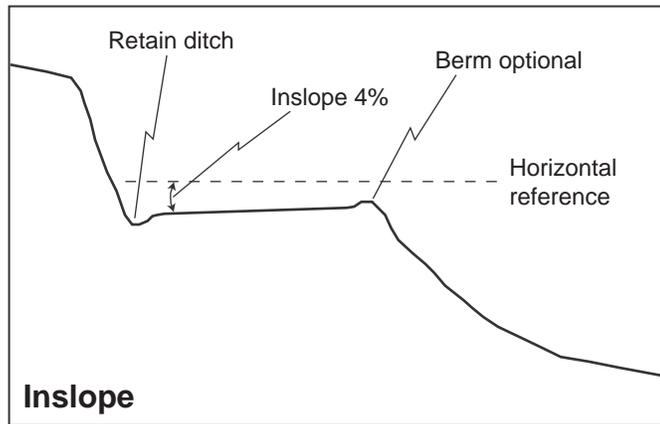
Ditch relief culvert installation

- 1) The same basic steps followed for stream crossing installation shall be employed.
- 2) Culverts shall be installed at a 30 degree angle to the ditch to lessen the chance of inlet erosion and plugging.
- 3) Culverts shall be seated on the natural slope or at a minimum depth of 5 feet at the outside edge of the road, whichever is less.
- 4) At a minimum, culverts shall be installed at a slope of 2 to 4 percent steeper than the approaching ditch grade, or at least 5 inches every 10 feet.
- 5) Backfill shall be compacted from the bed to a depth of 1 foot or 1/3 of the culvert diameter, which ever is greater, over the top of the culvert.
- 6) Culvert outlets shall extend beyond the base of the road fill (or a flume downspout will be used).
Culverts will be seated on the natural slope or at a depth of 5 feet at the outside edge of the road, whichever is less.

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Typical Designs for Using Road Shape to Control Road Runoff



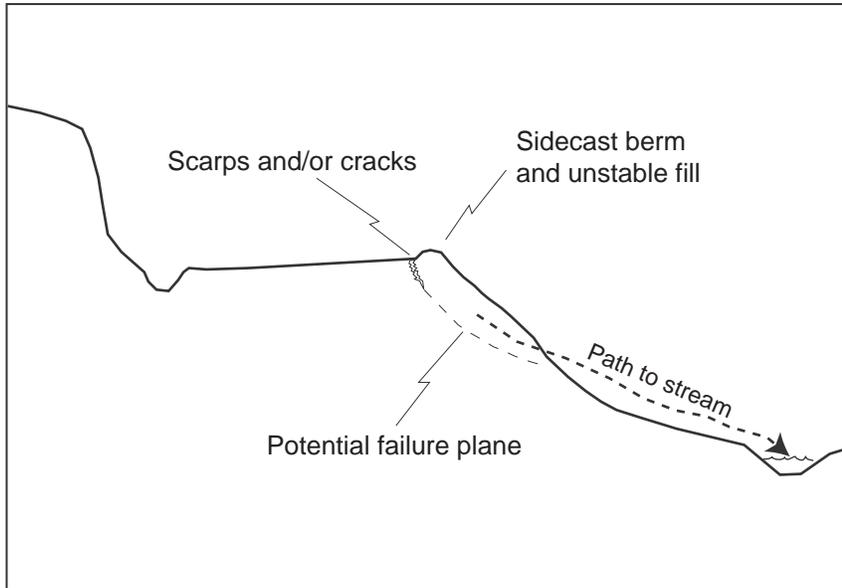
Outsloping Pitch for Roads Up to 8% Grade		
Road grade	Unsurfaced roads	Surfaced roads
4% or less	3/8" per foot	1/2" per foot
5%	1/2" per foot	5/8" per foot
6%	5/8" per foot	3/4" per foot
7%	3/4" per foot	7/8" per foot
8% or more	1" per foot	1 1/4" per foot

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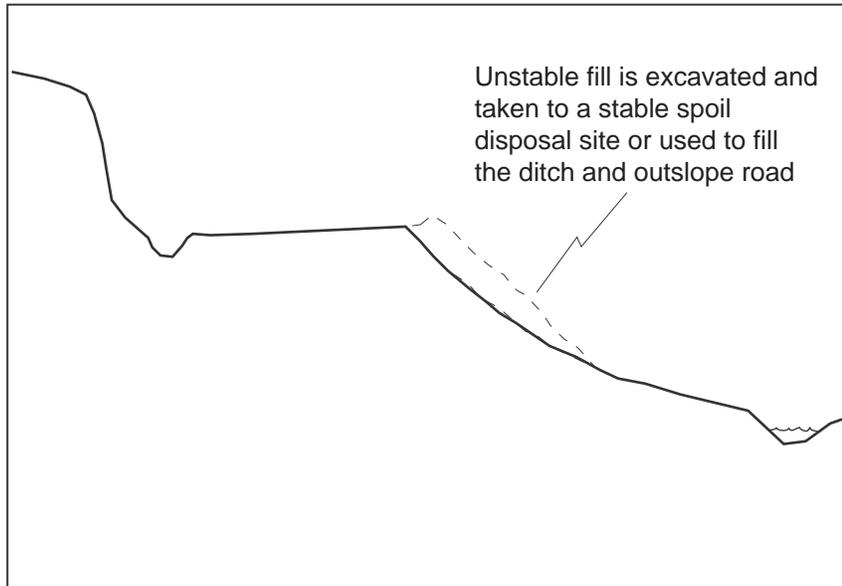
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Typical Excavation of Unstable Fillslope on an Upgraded Road

Before



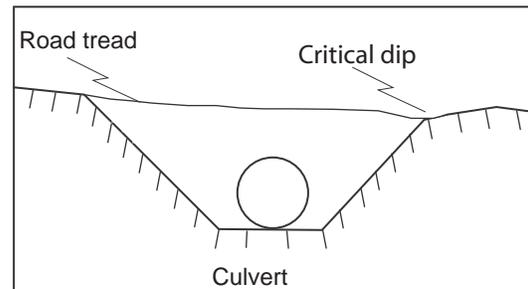
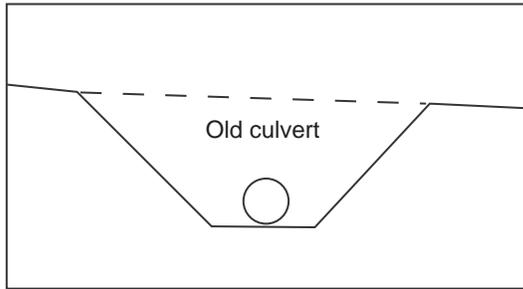
After



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Typical Design of Upgraded Stream Crossings



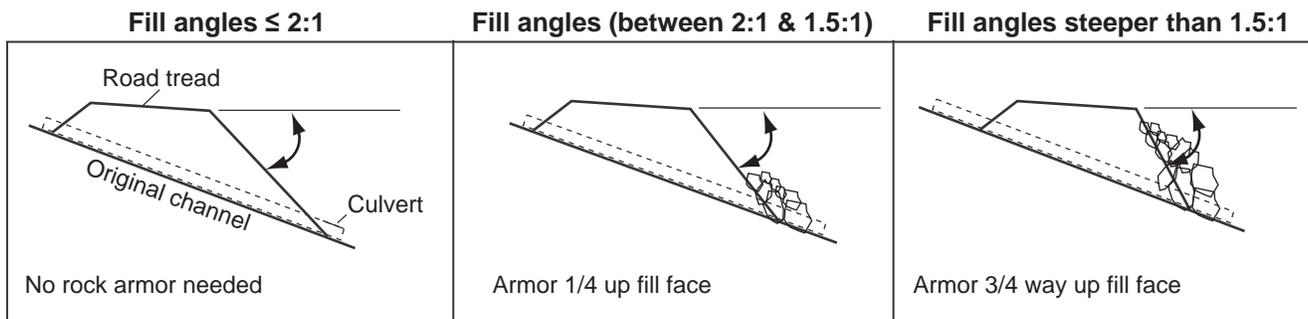
Stream crossing culvert Installation

1. Culverts shall be aligned with natural stream channels to ensure proper function, and prevent bank erosion and plugging by debris.
2. Culverts shall be placed at the base of the fill and the grade of the original streambed or downspouted past the base of the fill.
3. Culverts shall be set slightly below the original stream grade so that the water drops several inches as it enters the pipe.
5. To allow for sagging after burial, a camber shall be between 1.5 to 3 inches per 10 feet culvert pipe length.
6. Backfill material shall be free of rocks, limbs or other debris that could dent or puncture the pipe or allow water to seep around pipe.
7. First one end and then the other end of the culvert shall be covered and secured. The center is covered last.
8. Backfill material shall be tamped and compacted throughout the entire process:
 - Base and side wall material will be compacted before the pipe is placed in its bed.
 - backfill compacting will be done in 0.5 - 1 foot lifts until 1/3 of the diameter of the culvert has been covered. A gas powered tamper can be used for this work.
9. Inlets and outlets shall be armored with rock or mulched and seeded with grass as needed.
10. Trash protectors shall be installed just upstream from the culvert where there is a hazard of floating debris plugging the culvert.
11. Layers of fill will be pushed over the crossing until the final designed road grade is achieved, at a minimum of 1/3 to 1/2 the culvert diameter.

Note:

Road upgrading tasks typically include upgrading stream crossings by installing larger culverts and inlet protection (trash barriers) to prevent plugging. Culvert sizing for the 100-year peak storm flow should be determined by both field observation and calculations using a procedure such as the Rational Formula.

Armoring fill faces



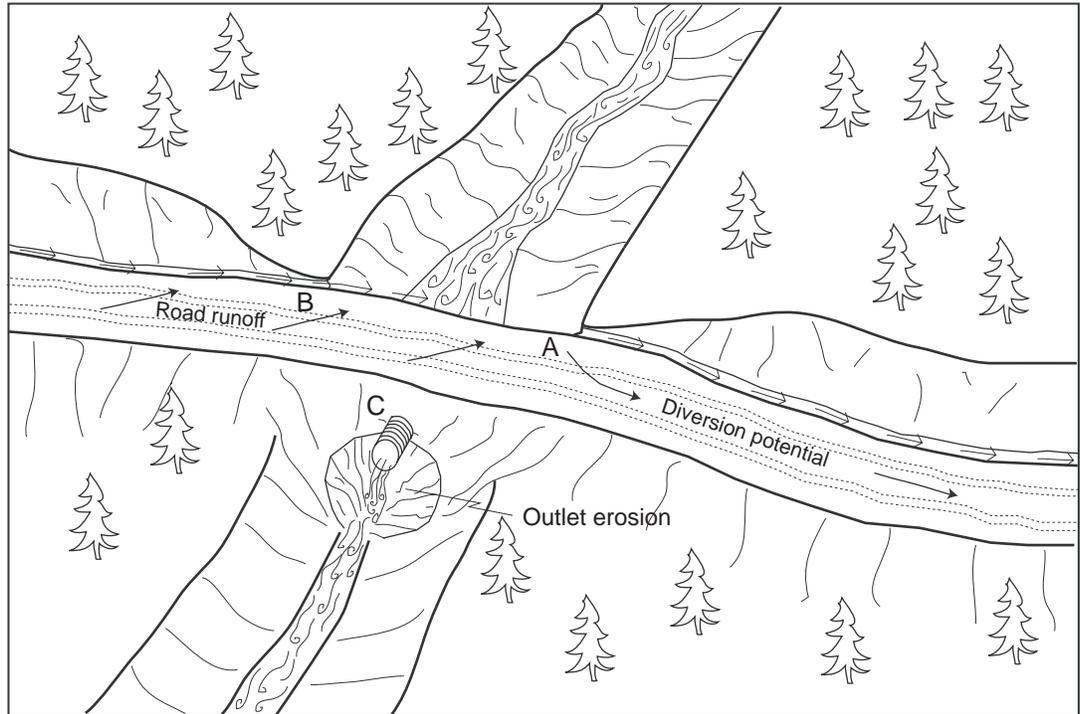
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Typical Problems and Applied Treatments for a Non-fish Bearing Upgraded Stream Crossing

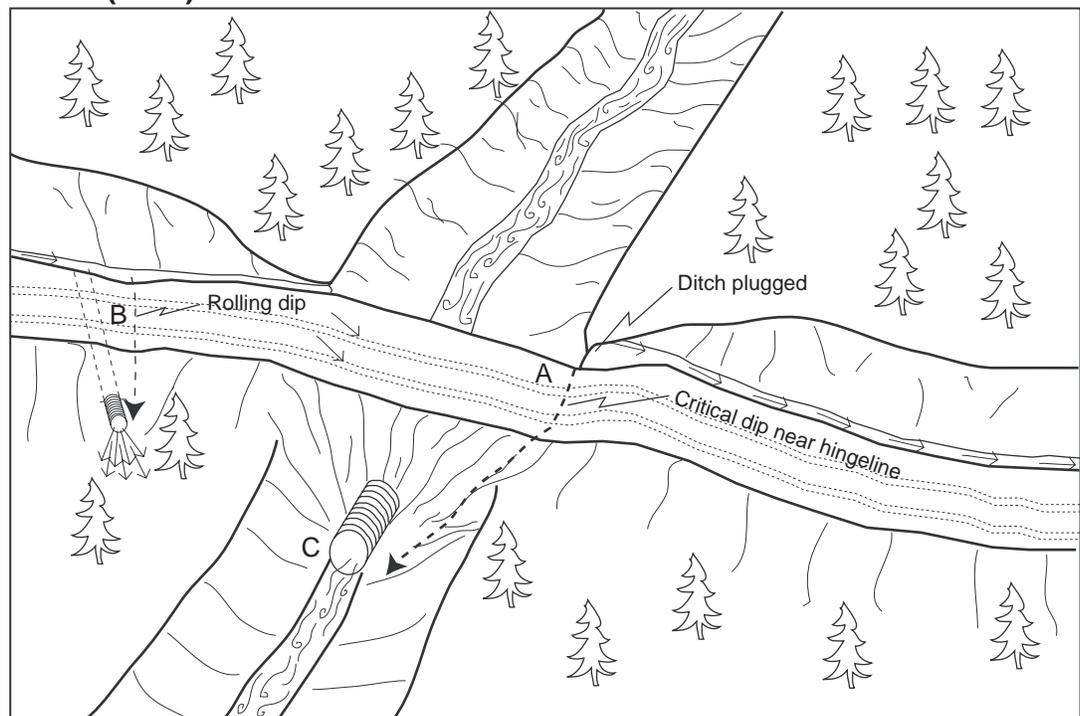
Problem condition (before)

- A - Diversion potential
- B - Road surface and ditch drain to stream
- C - Undersized culvert high in fill with outlet erosion



Treatment standards (after)

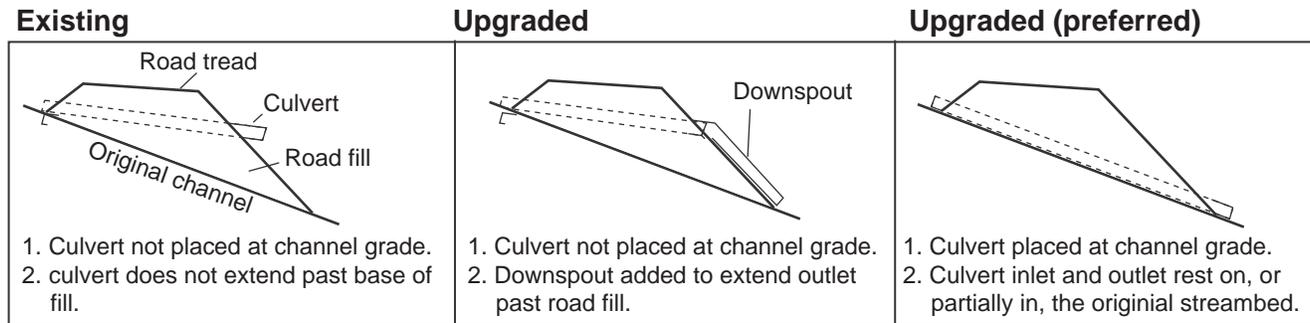
- A - No diversion potential with critical dip installed near hingeline
- B - Road surface and ditch disconnected from stream by rolling dip and ditch relief culvert
- C - 100-year culvert set at base of fill



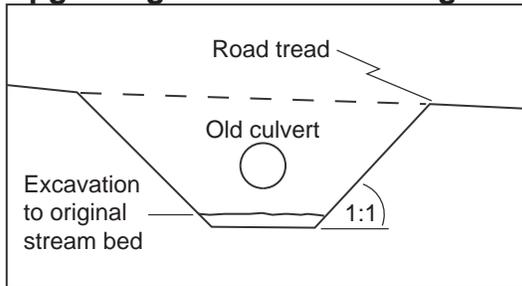
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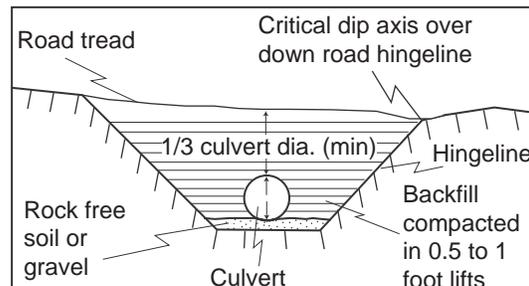
Typical Design of a Non-fish Bearing Culverted Stream Crossing



Excavation in preparation for upgrading culverted crossing



Upgraded stream crossing culvert installation



Note:

Road upgrading tasks typically include upgrading stream crossings by installing larger culverts and inlet protection (trash barriers) to prevent plugging. Culvert sizing for the 100-year peak storm flow should be determined by both field observation and calculations using a procedure such as the Rational Formula.

Stream crossing culvert Installation

1. Culverts shall be aligned with natural stream channels to ensure proper function, and prevent bank erosion and plugging by debris.
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Erosion control measures for culvert replacement

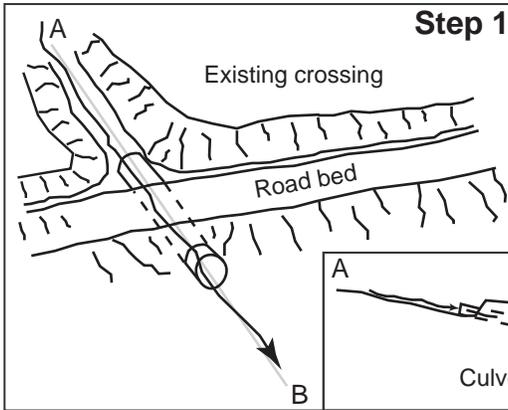
Both mechanical and vegetative measures will be employed to minimize accelerated erosion from stream crossing and ditch relief culvert upgrading. Erosion control measures implemented will be evaluated on a site by site basis. Erosion control measures include but are not limited to:

1. Minimizing soil exposure by limiting excavation areas and heavy equipment disturbance.
2. Installing filter windrows of slash at the base of the road fill to minimize the movement of eroded soil to downslope areas and stream channels.
3. Retaining rooted trees and shrubs at the base of the fill as "anchor" for the fill and filter windrows.
4. Bare slopes created by construction operations will be protected until vegetation can stabilize the surface. Surface erosion on exposed cuts and fills will be minimized by mulching, seeding, planting, compacting, armoring, and/or benching prior to the first rains.
5. Excess or unusable soil will be stored in long term spoil disposal locations that are not limited by factors such as excessive moisture, steep slopes greater than 10%, archeology potential, or proximity to a watercourse.
6. On running streams, water will be pumped or diverted past the crossing and into the downstream channel during the construction process.
7. Straw bales and/or silt fencing will be employed where necessary to control runoff within the construction zone.

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Ten Steps for Constructing a Typical Armored Fill Stream Crossing

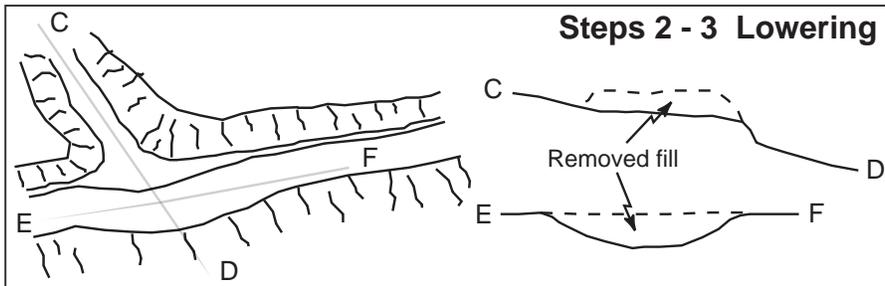


Step 1

1. The two most important points are:

A) **The rock must be placed in a "U" shape across the channel to confine flow within the armored area.** (Flow around the rock armor will gully the remaining fill. Proper shape of surrounding road fill and good rock placement will reduce the likelihood of crossing failure).

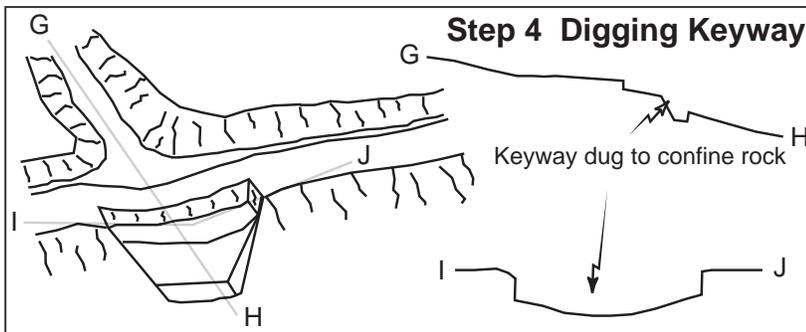
B) **The largest rocks must be used to buttress the rest of the armor in two locations:** i) The base of the armored fill where the fill meets natural channel. (This will buttress the armor placed on the outboard fill face and reduce the likelihood of it washing downslope). ii) The break in slope from the road tread to the outer fill face. (This will buttress the fill placed on the outer road tread and will determine the "base level" of the creek as it crosses the road surface).



Steps 2 - 3 Lowering

2. **Remove any existing drainage structures** including culverts and Humboldt logs.

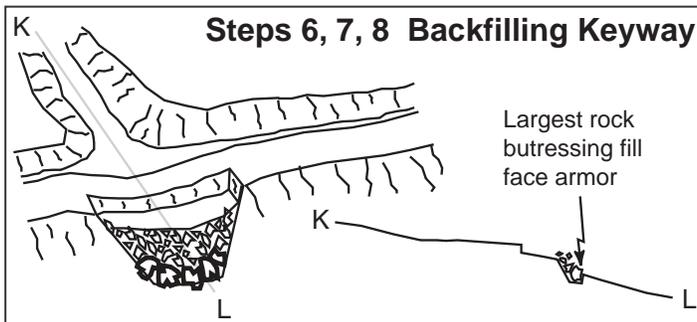
3. **Construct a dip** centered at the crossing that is large enough to accommodate the 100-year flow event and prevent diversion (C-D, E-F).



Step 4 Digging Keyway

4. **Dig a keyway** (to place rock in) that extends from the outer 1/3 of the road tread down the outboard road fill to the point where outboard fill meets natural channel (up to 3 feet into the channel bed depending on site specifics) (G-H, I-J).

5. **Install geofabric (optional)** within keyway to support rock in wet areas and to prevent winnowing of the crossing at low flows.

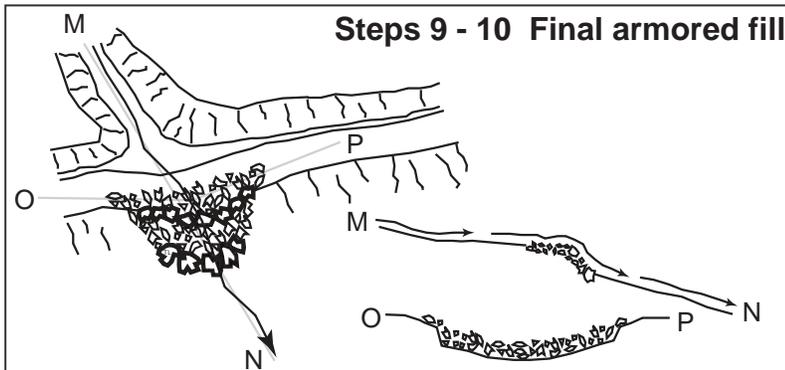


Steps 6, 7, 8 Backfilling Keyway

6. **Put aside the largest rock** armoring to create 2 buttresses in the next step.

7. **Create a buttress using the largest rock** (as described in the site treatments specifications) at the base of fill. (This should have a "U" shape to it and will define the outlet of the armored fill.)

8. **Backfill the fill face** with remaining rock armor making sure the final armored area has "U" shape that will accommodate the largest expected flow (K-L).



Steps 9 - 10 Final armored fill

9. **Install a second buttress** at the break in slope between the outboard road and the outboard fill face. (This should define the base level of the stream and determine how deep the stream will backfill after construction) (M-N).

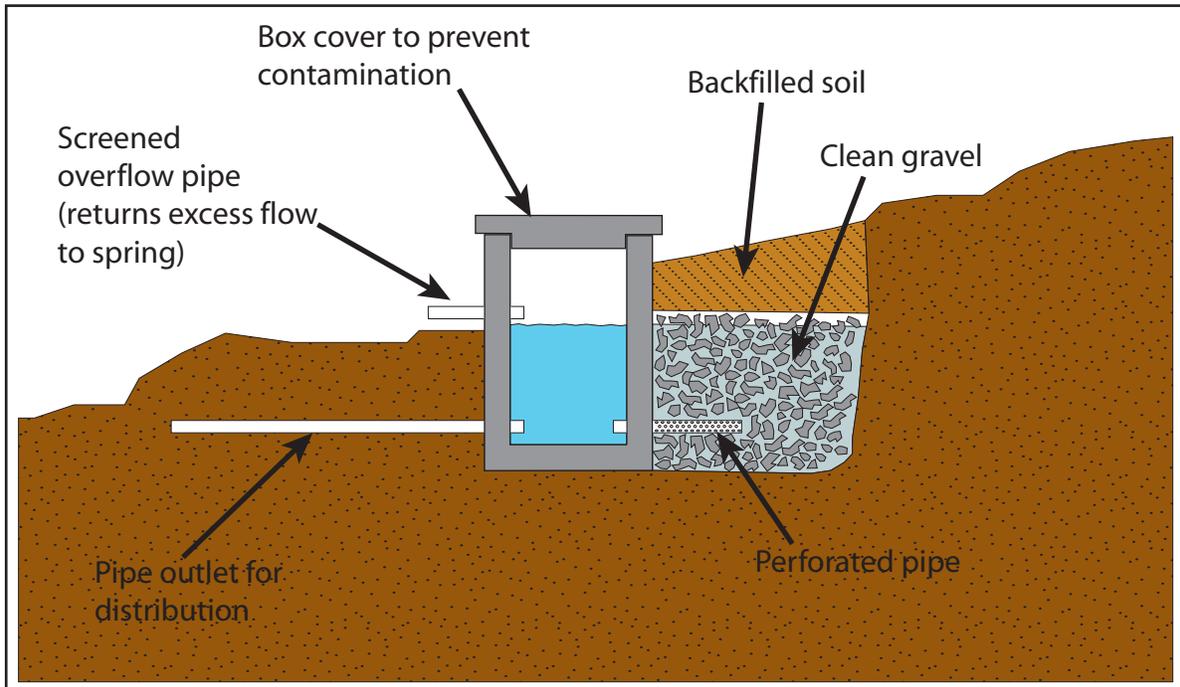
10. **Back fill the rest of the keyway** with the unsorted rock armor making sure the final armored area has a "U" shape that will accommodate the largest expected flow (O-P).

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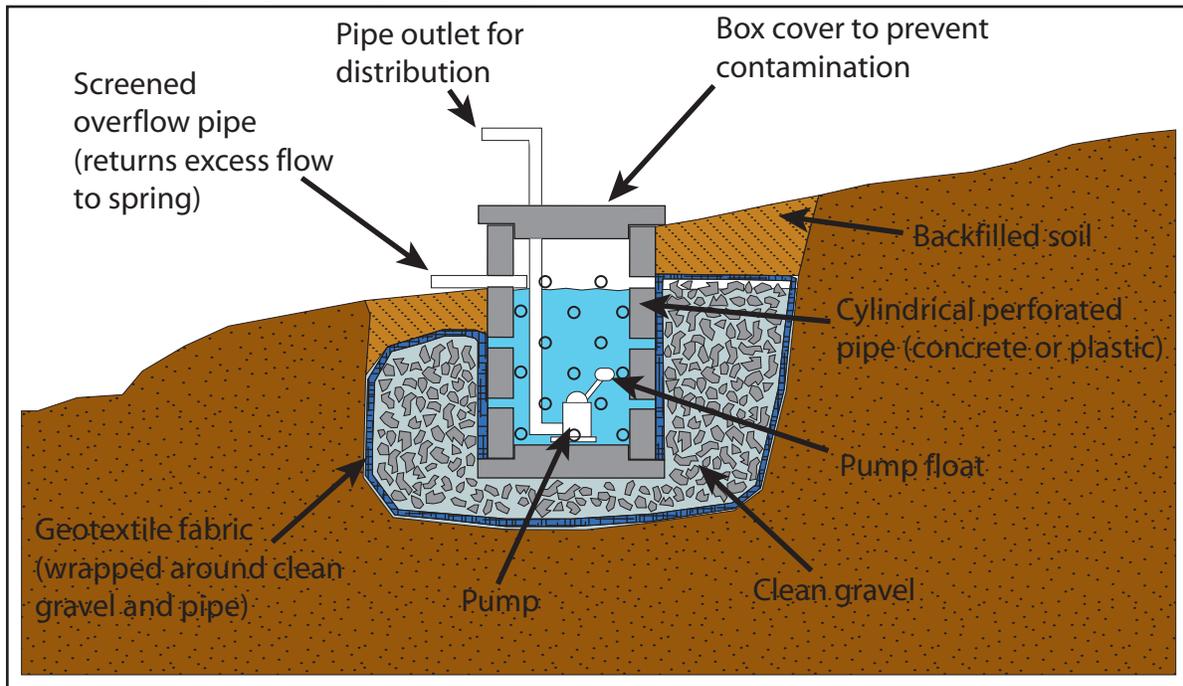
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Typical design drawings of spring boxes

Piped spring box - gravity system



Perforated spring box - pumped system

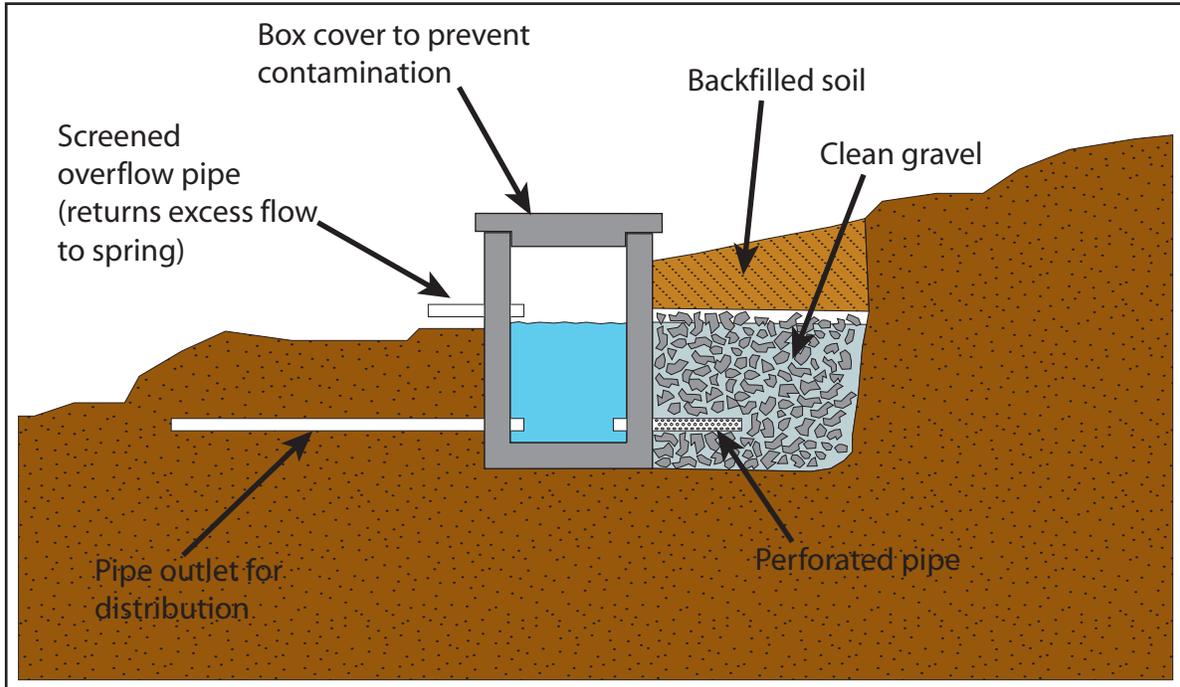


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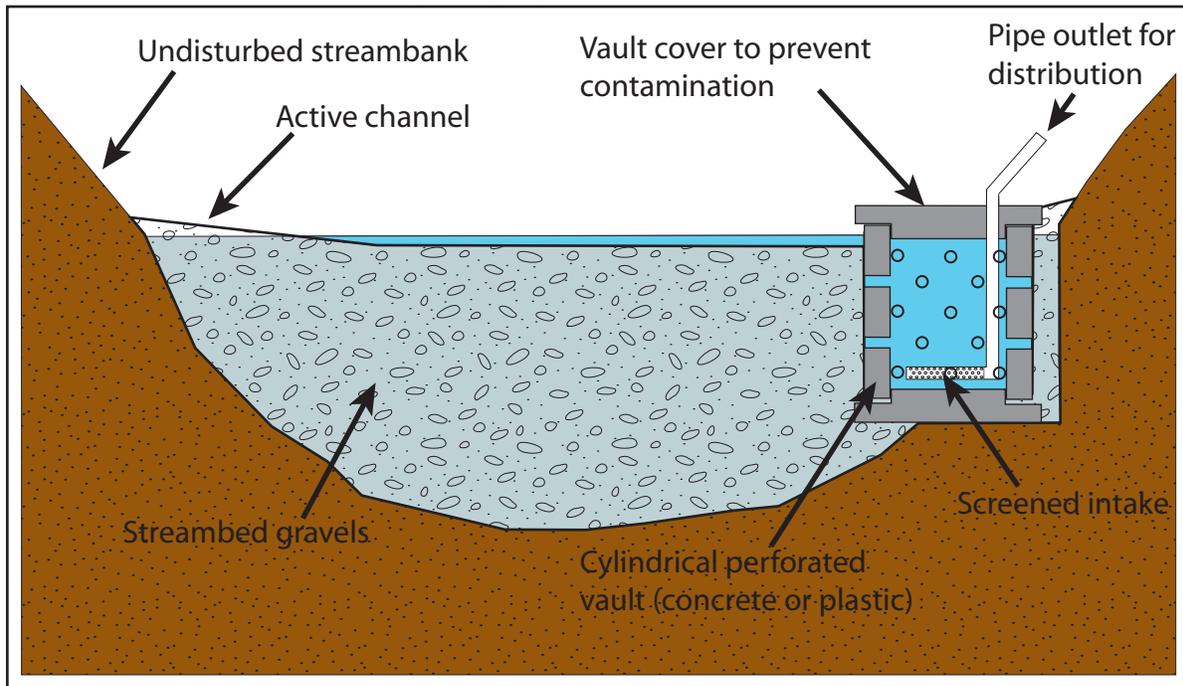
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Typical design drawings of spring box and vaulted screened intake gravity diversion infrastructure

Piped spring box - gravity system



Vaulted screened intake - gravity system



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Appendix H:
Storage of Hazardous Materials

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.