

Best Management Practices for Discharges of Waste Resulting from ~~Marijuana~~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. ~~Some or all may be added to the Order as mandatory BMPs for all sites.~~

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 construction project work season will~~shall~~ be from ~~June 15~~May 1 to October 15. ~~Exceptions may be requested on a site-specific basis. Work prior~~If operations are to June 15 or beyond be conducted during the winter period from October 15~~may to~~ May 1, a winter period operating plan must be authorized provided the work would be completed outside~~incorporated into the rainy season, avoiding potentially rising stream flows and exposure of disturbed soils to significant rainfall.~~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 ~~32~~-day (~~7248~~-hour) forecast¹ of rain ~~will~~shall be the trigger for temporary cessation of project construction activities and winterization/erosion protection of the work site.

Limitation on Earthmoving

3. Disturbance to existing grades and vegetation ~~will~~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 ~~will~~shall avoid or minimize disturbance to habitat ~~as much as possible~~.
- ~~5.~~ Disturbance to native shrubs, woody perennials or tree removal on the streambank or in the stream channel ~~will~~shall be avoided or minimized ~~to the fullest extent possible~~.
- ~~6.5.~~ . If riparian trees over six inches dbh (diameter at breast height) are to be removed, they ~~will~~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.
- ~~7.6.~~ If shrubs and ~~other~~ non-woody riparian vegetation are disturbed, they ~~will~~shall be replaced with similar native species appropriate to the site.
- ~~8.7.~~ Whenever feasible, finished grades ~~will~~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 ~~will~~shall be applied as appropriate for the project location.
- ~~9.8.~~ Spoils and excavated material not used during ~~construction~~ 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.
- ~~10.9.~~ Upon completion of grading, slope protection of all disturbed sites ~~will~~shall be provided prior to ~~November 1~~ 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.

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

11. Only native plant species willshall 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 willshall be the minimum necessary to avoid erosion, and willshall 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 ~~must~~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 willshall not be used in flowing water. Please refer to BMPs 57 through 64 for dewatering of live streams.
15. When possible, existing ingress or egress points willshall be used or work willshall be performed from the top of the creek banks.
16. Use of heavy equipment willshall 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, a rubber tire loader/backhoe is the preferred vehicle.~~
18. ~~17.~~ Wood or rubber mats willshall be placed on the ~~streambed~~channel bottom prior to use by ~~any other types of~~ 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 ~~creek bed~~channel shall be minimized.
20. When heavy equipment is used, any woody debris and stream bank or streambed vegetation disturbed willshall 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 willshall 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 willshall 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:
 - o Schedule excavation and grading activities for dry weather periods.
 - o Designate a contained area for equipment storage, short-term maintenance, and refueling. Ensure it is located at least 50 feet from waterbodies.
 - o Inspect vehicles for leaks and repair immediately.
 - o Clean up leaks, drips and other spills immediately to avoid soil or groundwater contamination.

- Conduct major vehicle maintenance and washing ~~off-site~~ 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 ~~off site~~ offsite.
- Ensure that all construction debris is taken to appropriate landfills and all sediment disposed of in upland areas or ~~off-site~~ offsite, beyond the 100-year floodplain.
- Use dry cleanup methods (*i.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 ~~will~~ shall be restored to pre-~~construction~~ project work condition or better.
23. All exposed soil resulting from the cleanup/restoration activities ~~will~~ 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 ~~will~~ shall be stabilized ~~following construction~~ by seeding, replanting, or other ~~agreed upon~~ means with native trees, shrubs, and/or grasses appropriate to the site prior to ~~November 1~~ the rainy season in the year work was conducted.
25. Soil exposed as a result of ~~construction project work~~, soil above rock riprap, and interstitial spaces between rocks ~~will~~ shall be revegetated with native vegetation by live planting, seed casting, or hydroseeding prior to ~~November 1~~ the rainy season of the year work ~~was~~ is completed.
26. The spread or introduction of exotic plant species ~~will~~ 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 ~~will~~ shall be done in preparation for establishment of native perennial plantings.
28. ~~To the extent possible, revegetation will~~ Revegetation shall be implemented ~~after the same time~~ 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 ~~will~~ shall be used for revegetation when implementing and maintaining cleanup/restoration work in riparian and other sensitive areas. Non-invasive, non-persistent grass species (*i.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 ~~will~~shall be conducted for ~~two~~three years following ~~construction~~project work.
31. Dischargers and/or their consultant(s) or third party representative(s) ~~will~~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) ~~will~~shall provide the location of each work site, pre- and post-~~construction~~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 ~~will~~shall be incorporated into the cleanup/restoration work design and installed ~~at~~prior to the ~~time~~end of ~~construction~~.
- ~~33.~~ Effective project work and before the beginning of the rainy season. Any continuing, approved project work conducted after October 15 shall have erosion control measures will works completed up-to-date and daily.
- ~~34.~~ Erosion control materials shall be in place, at minimum, stored on-site at all times during construction. Construction approved project work between May 1 and October 15.
- ~~34.~~35. Approved project work within the 5-year flood plain ~~will~~shall not begin until all temporary erosion controls (straw bales or silt fences that are effectively keyed-in) are ~~in place down slope~~installed downslope of cleanup/restoration activities.
- ~~35.~~36. Non-invasive, non-persistent grass species (i.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.
- ~~36.~~37. Upon work completion, all exposed soil present in and around the cleanup/restoration sites will~~shall~~ be stabilized within 7 days.
- ~~37.~~38. Soils exposed by cleanup/restoration operations will~~shall~~ be seeded and mulched to prevent sediment runoff and transport.

Miscellaneous

- ~~38.~~39. In siting ~~During temporary stream crossings, identify crossing siting.~~ locations shall be identified where erosion potential is low. ~~Avoid areas~~Areas where runoff from roadway side slopes will spill into the side slopes of the crossing shall be avoided.

- ~~39.40.~~ Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a ~~water body~~waterbody where wetland vegetation, riparian vegetation, or aquatic organisms may be ~~destroyed~~impacted.
- 40.41. 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.
- 41.42. Avoidance of ~~earthwork on steep slopes, proper compaction, and~~ minimization of ~~cut/fill canvolumes, combined with proper compaction, shall~~ occur to ensure the area is resilient to issues associated with ~~faults~~seismic events and ~~earthquakes~~mass wasting. If cracks are observed, or new construction is anticipated, consultation with a qualified ~~profession~~professional is appropriate.
- 42.43. Operations within the 100-year floodplain ~~have an inherent hazard of impact due to inundation. Generally, these areas should~~ shall be avoided. ~~In the instance that~~ Refuse and spoils shall not be stored within the hundred-year floodplain. If roads are located within the 100-year floodplain, they should shall be at grade; bridges ~~should~~shall have vented approaches and bridge deck ~~should~~shall be above anticipated 100-year flood water surface elevations. ~~Hydraulic calculations by~~ Consultation with a qualified ~~profession~~ may be appropriate to determine anticipated velocities and water surface elevations. Refuse and spoils shall not be stored within the hundred-year floodplain. professional is required for project work within the floodplain.
- 43.44. ~~Construction~~Project work-related dust shall be controlled. Dust control activities shall be conducted in such a manner that will not produce ~~downstream~~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, ~~will~~shall be implemented as appropriate.
- 44.45. Short term ~~construction~~impacts from project work-related emissions could include exhaust from construction equipment and fugitive dust from ~~land clearing, earthmoving, movement of vehicles, and wind erosion of~~ exposed soil during reservoir construction or removal, stream and/or riparian

restoration. These impacts can be minimized via retrofitting equipment and use of low emissions vehicles when possible.

45.46. ~~_____~~ Position ~~construction~~ 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 ~~will~~shall be employed:

46.47. ~~_____~~ Plant materials used ~~will~~shall be native to the site and ~~will~~shall be locally collected if possible.

47.48. ~~_____~~ Straw mulch ~~will~~shall be applied at a rate of 2 tons per acre of exposed soils and ~~will, shall~~ be secured to the ground ~~using hand tools or by placement of jute matting.~~

48.49. ~~_____~~ 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 ~~will~~shall be utilized, ~~if needed,~~ to keep sediment from flowing into the adjacent water body.

49. ~~Planting above the ordinary high water line may occur at any time of the year.~~

Structure for Water Control and Stream Crossings

These practices ~~will~~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 ~~will~~shall be employed for these types of projects:-

50. Culvert fill slopes shall be constructed at a 2:1 slope or ~~will~~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, ~~will~~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 Poned Areas

52. If it is necessary to conduct work in or near a live stream, the work space ~~will~~shall be isolated to avoid ~~construction project~~ activities in flowing water.

53. Water ~~will~~shall be directed around the work site.

54. ~~Where available, existing ingress~~ Ingress/egress points ~~will~~shall be utilized and work ~~will~~shall be performed from the top of the bank to the maximum extent possible.

55. Use of heavy equipment in a channel ~~will~~shall be avoided ~~when possible~~. If ~~accessor~~ accessor minimized. Please refer to the work site requires the use of BMPs 57 through 64 for dewatering of heavy equipment within the channel, the first choice will be to use a rubber tire loader/backhoe. Only after this option has been determined infeasible will the use of tracked vehicles be considered.
- 56.55. live streams. The amount of time construction equipment is stationed, working or traveling within the creek bed ~~will~~shall be minimized.
- 57.56. If the substrate of a seasonal pond, creek, stream or water body is altered during work activities, it ~~will~~shall be returned to approximate pre-construction conditions after the work is completed.

Temporary Stream Diversion and Dewatering: All Live Streams

- 58.57. For construction 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 ~~will~~shall be isolated with the use of temporary cofferdams upstream and downstream of the work site and all flowing water ~~will~~shall be diverted around the work site throughout the ~~construction project~~ period.
- 59.58. Other approved water diversion structures ~~will~~shall be utilized if installation of cofferdams is not feasible.
- 60.59. Cofferdams will be constructed with the use of off-site ~~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 ~~will~~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 ~~will~~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 ~~construction project~~ period.
62. The pipe ~~will~~shall be protected from ~~construction project~~ activities to ensure that bypass flows are not interrupted.
63. Continuous flow downstream of the work site ~~will~~shall be maintained at all times during ~~construction project work~~.
64. When ~~construction project work~~ is complete, the flow diversion structure ~~will~~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 ~~will~~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 ~~upon~~prior to completion of the ~~construction of the detention basin~~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. ~~Road drainage~~Drainage of roads, clearings, fill prisms, and terraced areas is critical to ensuring ~~the~~their integrity ~~of the road~~ and to prevent ~~and~~or minimize sediment discharges to watercourses. Proper design and location of roads and other features is critical to ensuring that a road ~~can~~or other feature be adequately drained and is best accomplished through consultation with a qualified professional. If inspection identifies surface rills or ruts, ~~road~~ 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.

71.73. 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 techniques can~~² are the preferred solution (e.g. live fascines), but other techniques may also be used appropriate including armoring (i.e.g. 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.

72.74. Road drainage shall be discharged to a stable location away from a watercourse. Use sediment control devices, such as check dams, sand/gravel

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/streamprotectio ncircular.pdf

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.

~~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.~~

73.75. ~~_____~~ Any spoils associated with ~~road~~ site maintenance shall be placed in a stable location where it cannot enter a watercourse. ~~Side cast should~~ Sidcasting shall be minimized and ~~should~~ shall be avoided on unstable areas or where it has the potential to enter a watercourse.

74.76. ~~_____~~ 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.

~~75.77. _____~~ 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.

~~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.

~~76.79. _____~~ 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.

B. 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. Stream Crossing Maintenance

~~77.80. _____ 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.~~

~~C. Stream Crossing Maintenance~~

~~78.81. _____ 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 fords, culverts³, armored fills with culverts³, and bridges³.~~

~~79.82. _____ Rock fords are only 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 only 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.~~

~~80.83. _____ Culverts Stream crossings consisting of armored fills with culverts and bridges are appropriate for streams with defined bed and bank². They must~~shall~~ be sized to ensure the 100-year streamflow event can pass unimpeded. Additionally, crossings must~~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.~~

~~81.84. _____ 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~~profession~~ is appropriate to evaluate maintenance or replacement needs and opportunities.~~

~~82.85. _____ 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).~~

- ~~o -If large wood is accumulated upstream or within the crossing that could impede flow or or deflect flow and result in erosion or debris capture other debris, the wood should generally be removed or re-oriented. In some cases, it may be appropriate to re-orient debris with the streamflow.~~

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

~~83.~~ If sediment or debris is accumulated within a culvert and limits flow capacity, the culvert short term solution should generally be cleaned to clean out the culvert and place the debris and sediment spoiled to in a stable location with no potential to discharge into a stream.

- ~~o~~ In some cases, ~~Ditch relief culverts shall also be inspected regularly, and cleared of debris and sediment.~~ In some cases a trash rack or, post, or other deflection structure at the culvert inlet can reduce plugging.
- ~~o~~ 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.

~~84.~~86. The roadway adjacent to and over the crossing is an area of potential discharge. All road surfaces approaching a crossing ~~should~~ 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.

~~85.~~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. ~~The~~ 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.

~~D. Protecting Stream and River Corridors:~~

C. Riparian and Wetland Protection and Management:

~~86.~~88. Buffer width ~~must~~ will be in compliance with Tier category.

~~87.~~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.g., larger pieces of wood are necessary to withstand flows in large streams). ~~Generally speaking, LWD includes logs of at least 4 inches diameter and at least 6 feet long, and root wads of at least 8 inches diameter and at least 6 feet long. To function in the stream, LWD needs~~

~~to extend into the bankfull channel at least four inches.~~ In the event that LWD or trees are disturbed during excavation, care ~~should~~shall be taken to separate the ~~pieces~~LWD from soil. The pieces ~~should~~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.

~~88-90.~~ 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.

E.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, ~~it is advisable to implement~~ the following measures ~~is shall be implemented when~~ placing or disposing of spoils onsite:

- ~~89-91.~~ 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;
- ~~90-92.~~ 92. Compact and contour stored spoils to mimic the natural slope contours and drainage patterns to reduce the potential for fill saturation and failure;
- ~~91-93.~~ 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, ~~or.~~
- ~~92-96.~~ 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.

~~93.97.~~ 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.

~~94.98.~~ 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.

~~Spread material, which is not planned to be reused, in compacted layers, generally conforming to the local topography.~~

~~95.99.~~ 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.

~~96.100.~~ _____ Revegetate the disposal site with a mix of native plant species. Cover the seeded and planted areas with mulched straw at a rate of ~~1 to 1 1/2~~ 2 tons per acre. Apply jute netting or similar erosion control fabric on slopes greater than 2:1 if site is erosive.

F.E. _____ Water Storage and Use

WATER USE

~~97.101.~~ _____ Conduct operations on a size and scale that considers available water sources and other water use and users in the planning watershed.

~~98.102.~~ _____ Implement water conservation measures such as rainwater catchment systems, drip irrigation, mulching, or irrigation water recycling. (Also see BMPs for Irrigation, below)

~~99.103.~~ _____ 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.

~~100.106.~~ _____ Apply water at agronomic rates (do not overwater plants).

WATER STORAGE (ponds and vessels)

~~101.107.~~ 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.

~~102.108.~~ 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.

~~103.109.~~ Horizontal tanks ~~must~~shall be secured with bands and/or hoops to prevent tank movement.

~~Water storage must be off-stream, not in watercourses.~~

~~104.110.~~ 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.

~~105.111.~~ Provide adequate outlet drainage for overflow of ponds, including low impact designs, to promote dispersal and infiltration of flows.

~~106.112.~~ Place proper lining or sealing in ponds to prevent water loss.

~~107.113.~~ Storage bladders are not encouraged. Where for long term water storage reliability. If they are used/utilized, ensure that they are designed to store water, and that they are ~~located in a method and manner that~~ minimizessited 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.

G.F. Irrigation Runoff

~~108.~~114. Irrigate at rates to avoid or minimize runoff.

~~109.~~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.

~~110.~~117. Recapture and reuse irrigation runoff (aka-tailwater) where possible, through passive (gravity-fed) or active (pumped) means.

~~111.~~118. Construct retention ponds/basins for percolating tailwater through ground 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.

~~112.~~119. Regularly replace worn, outdated or inefficient irrigation system components and equipment.

~~113.~~120. Use mulches (such as e.g. wood chips or bark) in planter/cultivation areas that do not have ground cover to prevent erosion and minimize evaporative loss.

~~114.~~121. Leave a vegetative barrier along the property boundary and interior watercourses to act as a pollutant filter.

~~115.~~122. Employ rain-triggered shutoff devices to prevent irrigation after precipitation.

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

~~116.~~123. Evaluate irrigation water, soils, growth media, and plant tissue to optimize plant growth and avoid over-fertilization.

~~117.~~124. Reference Department of Pesticide Regulations Guidance (see Attachments E-1 and E-2 of Order No. R1-2015-0023)

- ~~118.~~125. All chemicals ~~must~~shall be stored in a manner, method, and location that ensures that there is no threat of discharge to waters of the state.
- ~~119.~~126. Products ~~must~~shall be labeled properly and applied according to the label.
- ~~120.~~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.
- ~~121.~~128. Periodically calibrate pesticide application equipment.
- ~~122.~~129. Use anti-backflow devices on water supply hoses, and other mixing/loading practices designed to reduce the risk of runoff and spills.
- ~~123.~~130. Petroleum products ~~must~~shall be stored with a secondary containment system.
- ~~124.~~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.
- ~~125.~~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.
- ~~126.~~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.
- ~~127.~~134. Have proper storage instructions posted at all times in an open and conspicuous location.
- ~~128.~~135. Prepare and keep onsite a Spill Prevention, Countermeasures, and Cleanup Plan (SPCC Plan~~).~~ if applicable⁴.

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

~~129.~~136. Keep ample supply of appropriate spill clean-up material near storage areas.

I.H. Cultivation-Related Wastes

~~Planting waste shall be stored in watertight dumpsters or securely covered from wind and rain by covering the waste with tarps or plastic sheeting.~~

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.

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.I. Refuse and Human Waste

~~Dumpsters~~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

section 25270-25270.13) A sample SPCC can be found here:
<http://www.calcupa.net/civica/filebank/blobdload.asp?BlobID=3186>

precipitation and prevent rainfall from entering containers. Use lined bins or dumpsters to reduce leaking of liquid waste.

~~Full dumpsters shall be removed from the site and the contents shall be disposed of properly.~~

~~Follow County ordinances for human waste disposal requirements and/or the OWTS Policy.~~

~~130.141. 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.~~

~~Make sure trash container areas are screened or walled to prevent off-site transport of trash.~~

~~Use lined bins or dumpsters to reduce leaking of liquid waste.~~

~~Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.~~

~~Consider using refuse containers that are bear-proof and/or secure from wildlife.~~

K. Cleanup, Restoration, and Mitigation

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

Use soil bioengineering techniques when possible for restoration, such as Brush layering and brush matting.

Use native vegetation whenever possible for restoration projects.

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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