Dist-County-Route: 03-ED-50
Post Mile Limits: 16.4/16.8
Type of Work: New On-Ramp and Drainage Appurtenances
Project ID (EA): 0319000152 (03-372821)
Program Identification: ________________________________
Phase: □ PID □ PA/ED □ PS&E

Regional Water Quality Control Board(s): Region 5S – Central Valley
Total Disturbed Soil Area: 3.64 PCTA: 1.11
Alternative Compliance (acres): 1.90 ATA 2 (50% Rule)? Yes □ No □
Estimated Const. Start Date: 02-01-2021 Estimated Const. Completion Date: 11-30-2021
Risk Level: □ RL 1 □ RL 2 □ RL 3 □ WPCP □ Other: __________
Is MWELO applicable? Yes □ No □
Is the Project within a TMDL watershed? Yes □ No □
TMDL Compliance Units (acres): N/A
Notification of ADL reuse (if yes, provide date): Yes □ Date: __________ No □

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E only.

Ryan Ruddick, Registered Civil Engineer 8-20-2020

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Jesus Avila, Project Manager 08-31-2020
Anthony Thurman, Designated Maintenance Rep. 9/1/2020
Nicki Johnson, Designated Landscape Architect Rep. 9/2/2020

Russ Petty, District/Regional Design SW Coordinator or Designee 09/02/2020

[Stamp Required at PS&E only]
STORMWATER DATA INFORMATION

1. Project Description

The proposed Western Placerville Interchange Project – Phase 2.2 (Project) is located within the limits of the City of Placerville (City) in El Dorado County (County), California. The City proposes construction of a new, looped freeway on-ramp onto eastbound US 50, complimentary to the eastbound US 50 off-ramp completed in 2019 under EA# 03-37281. Immediately north of the park-and-ride facility at Ray Lawyer Drive and Forni Road, the Project will start at the intersection of Ray Lawyer Drive and Forni Road, and the on ramp will connect east-bound traffic onto US 50. Traffic signals at Ray Lawyer Drive and Forni Road will be modified to accommodate the east-bound on-ramp. The Project will also include: installation of ramp metering signals and signage at the new, looped freeway on-ramp; excavation and modification of the slopes along US 50 at the downstream end of the proposed on-ramp; excavation and modification of the slope under the Ray Lawyer Drive overcrossing to accommodate for the width of the proposed on-ramp; and construction of drainage facilities to convey runoff from the onramp area to the existing drainage basin immediately to the southwest.

The Project’s Project Approval/Environmental Document (PA/ED) phase was completed in fall 2005, the Project Report was approved in January 2008. Environmental documents were re-validated for the Project in November of 2019.

This project is also addressing an existing detention basin that was partially finished under 03-37281 for Maintenance construction stormwater acceptance purposes. The existing basin, constructed with the Western Placerville Interchanges Phase 2 project (03-37281) was completed fall 2019, but not accepted by Caltrans. This basin will be modified with this project to meet the Caltrans requirements of Detention Device Treatment BMPs. This detention basin is designed and sized to treat the NIS for this Project.

The disturbed soil area (DSA) includes the proposed impervious area improvements, areas of cut and fill, and areas of earthwork. The net new impervious (NNI) area is the difference between the pre-Project and post-Project impervious areas, considering new and removed impervious surfaces. The replaced impervious surface (RIS) area is where existing impervious surface will be removed to an erodible layer and replaced with new impervious material. The sum of the NNI and RIS equals the Project’s new impervious surface (NIS). Because the NIS is greater than 1 acre, this Project is required to consider implementation of permanent stormwater treatment BMPs. Treatment BMPs to address total maximum daily loads (TMDLs) are not required and are not being incorporated.

The (DSA) and impervious area values within the Project are listed in Table 1. The runoff will be treated per Caltrans MS4 Permit.
Table 1. Project Disturbed Soil and Impervious Areas

<table>
<thead>
<tr>
<th>Hydrologic Area</th>
<th>Impervious Area (acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Project</td>
</tr>
<tr>
<td>DSA (acre)</td>
<td></td>
</tr>
<tr>
<td>3.64</td>
<td>5.74</td>
</tr>
</tbody>
</table>

2. Site Data and Stormwater Quality Design Issues

The Project is located within the Caltrans District 3 and the Central Valley Regional Water Quality Control Board (RWQCB)-Region 5S.

Hydrologic Watershed

The Project limits are within the Hangtown Creek watershed and of the larger Weber Creek watershed. Table 2 lists the hydrologic watershed classifications of the Project site.

Table 2. Project Hydrologic Unit Summary

<table>
<thead>
<tr>
<th>Hydrologic Unit</th>
<th>Hydrologic Area</th>
<th>Hydrologic Sub-Area</th>
<th>Planning Watershed</th>
</tr>
</thead>
<tbody>
<tr>
<td>American River</td>
<td>South Fork American River</td>
<td>Weber Creek - 514.31</td>
<td>5514310201</td>
</tr>
</tbody>
</table>

Receiving Water Bodies

Hangtown Creek is the only named receiving water body for Project runoff. Two culverts convey channel flow collected from upland areas (area around the jail, along Gold Nugget Way, and around the auto dealerships) under US 50, and outlet to Hangtown Creek. These two unnamed channels are considered waters of the U.S. Hangtown Creek flows into Weber Creek, and Weber Creek flows into the South Fork American River.

Clean Water Act 303(d) list / Pollutants of Concern

The 2012 California Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) identifies Hangtown and Weber creeks as Category 3 water bodies, which are described as “waters with insufficient information to assess beneficial uses.” The creeks are on the report for municipal and domestic drinking water supply with pollutant-specific conductivity and aquatic life support of cold freshwater habitat with pollutant of pH. This project does not lie within a TMDL watershed.

Drinking Water Reservoirs / Recharge Facilities

The Caltrans District 3 Work Plan does not identify any drinking water reservoirs or recharge facilities within the Project limits.
Beneficial Uses

The Central Valley RWQCB Basin Plan (revised October 2011 with approved amendments) identifies narrative and numerical water quality objectives for the region. The general water quality objectives established within the Central Valley region include: bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, mercury, methylmercury, oil and grease, pesticides, pH, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity. The Basin Plan lists beneficial uses for hydrologic unit number 514.31, which are listed in Table 3.

Table 3. Beneficial Uses for Hydrologic Unit 514.31

<table>
<thead>
<tr>
<th>Beneficial Uses</th>
<th>MUN</th>
<th>AGR</th>
<th>IND</th>
<th>REC-1</th>
<th>REC-2</th>
<th>WARM</th>
<th>COLD</th>
<th>MIGR</th>
<th>SPWN</th>
<th>WILD</th>
<th>NAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>E</td>
<td>E</td>
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<td>E</td>
<td>E</td>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

AGR — Agricultural Supply
COLD — Cold Freshwater Habitat
IND — Industrial Service Supply
E — Existing Beneficial Uses
MIGR — Fish Migration
MUN — Municipal & Domestic Water Supply

NAV — Navigation
REC-1 — Water Contact Recreation
REC-2 — Non-contact Water Recreation
SPWN — Fish Spawning
WARM — Warm Freshwater Habitat
WILD — Wildlife Habitat

401 / 404 Certification

The Clean Water Act Section 401 Water Quality Certification and Order for this project was issued on June 13, 2017 and is active until July 7, 2022 under Reg. Meas. ID #412181, Place ID#833657. The Clean Water Act Section 404 Permit was issued on July 10, 2017.

Local Agency Requirements / Concerns

This Project discharges to and proposes improvements within the County and the City MS4s. The County and City are traditional permittees under the Statewide Phase II Small MS4 General Permit (Order No. 2013-0001-DWQ). Therefore, this Project will be required to comply with this permit’s requirements for post-construction stormwater management.

All non-stormwater discharges leaving the site and entering the City’s stormwater conveyance system are subject to Placerville Municipal Code Chapter 7-15.
Climate

The Project area is marked by hot summers and moderately cold winters. The average monthly temperature ranges from 42°F in December to 74°F in July. The average maximum monthly temperature ranges from 53°F in December to 92°F in July.

The growing season ranges from 175 to 200 days. The average date of the last freezing temperature is the first of March, and the average date of the first freezing temperature is the end of October. The average monthly precipitation ranges from 0.09 inches in August to 7.14 inches in January. The average annual precipitation is 38.63 inches. Approximately 93 percent of precipitation is rainfall and 7 percent is snow.

The Caltrans Project Planning and Design Guide (PPDG, 2017) identifies the rainfall intensity for the Project area is 0.20 inches per hour, which is used to calculate the water quality flow (WQF) for treatment BMPS. The 85th percentile 24-hour storm event produces a precipitation depth of 1.13 inches, per the Caltrans Basin Sizer using the Caltrans “Placerville” station which is the nearest station to the project site.

Soil

According to the NRCS Web Soil Survey (2020), Boomer gravelly loam (BhC and BhD) accounts for 65.6% the soils (8.6% at 3–15% slopes and 57% at 8-35% slopes). The soil is characterized as medium runoff class and as having no flooding or ponding. Boomer very rocky loam comprise 34.4% at 30-50% slopes. The soil is characterized as high runoff class and as having no flooding or ponding. Soil erosion factors are soil properties and interpretation used in evaluating the soil for potential erosion. The erosion factor, K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.10 to 0.43. With other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

The soil erosion potential, dependent on landscape, climate, and soil properties, is estimated by the K factor derived for the Universal Soil Loss Equation. Determined using the Caltrans Water Quality Planning Tool, the K factor for this site is 0.32, with a low to moderate susceptibility to water erosion.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wetted, and receive precipitation from long duration storms. Soils are assigned to four groups: A, B, C, and D (in descending order of infiltration rates). Boomer soils, which comprise all of the Project soils, are classified as being within Hydrologic Soil Group (HSG) C. HSG C soils have a slow infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well-drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission. Cohasset soils (3.2% of the Project soils) are classified as HSG B soils, and have moderate infiltration when thoroughly wet.

For additional Soil Classification information, refer to Section 2.3.2 of the Drainage Report for Western Placerville Interchanges Phases 2.2 (03-372821), (WRECO, August 6, 2020).

Geology

The following geologic information was obtained from the Initial Site Assessment (ISA) for the Project (Dokken Engineering 2010). The Project site is on the gentle western slope of the Sierra Nevada fault block, which eventually disappears under the sediments of the Great Valley. The deep river
Canyons that cut into the western slope give the area its great relief. Eruptions from andesitic volcanoes high in the Sierra Nevada sent lava, ash, and mud flows down the tertiary streams on the western slope. These igneous deposits have withstood the elements and erosion and now exist as ridges and outcrops in the foothills.

The Project area is located along a belt of northwest-trending metamorphic rocks, which are distributed within three major faults bounded lithologic terrains that extend along the length of the metamorphic belt. The terrains are composed of thick accumulations of Paleozoic and Mesozoic marine sedimentary and volcanic rocks of varying lithologies that have been deformed, intruded, and metamorphosed. The rock sequences have been isoclinally folded and faulted to such an extent that true stratigraphic thicknesses cannot be accurately measured. Bedding, foliation, and major structural features throughout the metamorphic belt generally trend northwest and dip steeply to the east.

**Groundwater**

Groundwater in the Project area has been measured to be 7 feet and 13 feet below ground surface at two different locations in 2012. The current Geotechnical Design Report indicated no signs of groundwater in Project related explorations. Seasonal fluctuations in groundwater and rainfall contributions, however, may cause variation in the level of the water table (GEOCON 2016).

**Hazardous Materials**

Yellow traffic stripes contain lead and chromium above hazardous waste thresholds and may produce toxic fumes when heated. Caltrans Hazardous Waste provisions will be followed for removal of any yellow traffic striping.

**Aerially Deposited Lead**

It is expected that soils containing aerially deposited lead will be encountered during construction; however, these soils will not be reused if the levels are higher than allowable reuse limits stated in the Standard Specifications. An Aerially Deposited Lead Site Investigation Report concluded that the upper 0.5 feet of earthen material is classified as a California hazardous waste and may be used on-site in accordance with the Department of Toxic Substances Control (DTSC) Variance (as Caltrans Type Y2 material). The underlying soils are not classified as such and will be managed separately (GEOCON 2009).

It is recommended that the contractor conduct all grading operations with the awareness that lead-impacted soil is present on the site and conduct all operations in accordance with applicable Cal-OSHA requirements, including a project-specific worker Health and Safety Plan and Lead Compliance Plan.

**Topography**

The Project is located in a hilly and relatively rural area. The Project site elevations range between 1,800 and 1,900 feet, North American Datum of 1983.
Right-of-Way Requirements

The Project extends through and proposes improvements within Caltrans R/W. There are no additional R/W requirements proposed for BMPs.

Slope Stabilization

The Caltrans District 3 Work Plan does not identify any slopes prone to erosion within or near the Project area. The steep topography of the site necessitates the use of appropriate slope stabilization techniques to minimize erosion in the Project area. The following precautions have or will be taken to minimize slope instability and reduce the impacts of stormwater:

- Only disturbing existing slopes when necessary.
- Minimization of cut and fill areas to reduce the slope lengths.
- Flattening of cut and fill slopes.
- Collection of concentrated flows into stabilized drains and channels.
- Construction scheduling to install permanent measures such as biofiltration swales, vegetated slopes, basins, and conveyance systems to collect and minimize the impact of construction stormwater.

Land Use

The Project area consists of paved roads and grassy and wooded pervious areas between the roads. Surrounding land use includes government facilities, residences, and commercial developments. The majority of the land in the upland watershed is undeveloped woodland with shrub growth.

Measures for Avoiding or Reducing Potential Stormwater Impacts

The Project cannot be relocated or realigned to avoid or reduce impacts to receiving water bodies. As designed the project minimizes the impacts to receiving water bodies.

Where possible, slopes were designed to be less than 2:1 (H:V) and will be compacted as specified in the Caltrans Standard Specifications. New and disturbed slopes will be stabilized using permanent erosion control measures, and concentrated flows will be collected into stabilized drains and channels. The plans identify the drainage and erosion control types and locations. Section 6 of this report summarizes the permanent BMP methods used for this Project.

Measures will be used to prevent any construction material from entering the receiving water body. The construction site BMP strategy is discussed in Section 3 of this report.

Existing Hydrology

Per the Drainage Report for Western Placerville Interchange Project Phase 2.2, (WRECO, August 6, 2020), there are three locations within the Project vicinity where the increase of concentrated stormwater runoff was to be prevented. These are identified as STO-1, STO-2, and DB-1 in the hydrologic model (see Figure 6 of the Drainage Report). SHED 1 is located south of US 50 and
discharges to a storage area (STO-1) upstream of Culvert 1, an existing 36-inch culvert under US 50 approximately 1,000 feet east of Ray Lawyer Drive (see Figure 7 of the Drainage Report). SHED 2 is also located south of US 50 and immediately east of Ray Lawyer Drive. SHED 2 discharges to a storage area (STO-2) upstream of Culvert 2, an existing 24-inch culvert under US 50 approximately 300 feet east of Ray Lawyer Drive (see Figure 7 of the Drainage Report). SHED 8 is located south of US 50 and west of US 50. SHED 8 was split into SHED 8A-1, SHED 8C-1, and SHED 8C-2 under Phase 2.2 (03-372821) conditions. SHED 8C-2 is the area carved out of SHED 8C by the eastbound on-ramp at Ray Lawyer Drive. SHED 8C-1 and SHED 8C-2 discharge to DB-1. SHED 8A-1 is located north of US 50 and west of Ray Lawyer Drive and discharges to DB-1 through an 18-inch pipe under US 50. SHED 8A-1 will not be impacted by the on-ramp and was included in the hydrology model so it can be accounted for in the analysis.

The Drainage Report for Western Placerville Interchange Project Phase 2.2 (WRECO, August 6, 2020) includes modeling of the discharge points DB-1, STO-1, and STO-2 with an elevation-storage relationship based on area measurements taken from the proposed grading design for the drainage basin and from the topographic map for the two storage areas. The proposed Project improvements will maintain existing drainage patterns into these discharge points.

This project, Phase 2.2 (03-372821) will include stormwater discharges into the existing detention basin (DB-1) constructed but not accepted by Caltrans Construction and Stormwater Maintenance, with the Phase 2 (03-37281) project. Therefore, the basin modified by this project will not be classified as an existing TBMP. The Phase 2 (03-37281) design team performed calculations and made changes to address the concerns of the stormwater team, which will be implemented with this project, Phase 2.2 (03-372821). The calculations and supporting information for the changes made can be found in Drainage Report for the Western Placerville Interchange Project, Phase 2.2 (WRECO August 2020).

DB-1 is used for flow attenuation. The modifications to DB-1 implemented with the Phase 2.2 project include a low flow channel, modifications to the outlets, and other improvements as described in the Drainage Report. The DB-1 outlets include a new 1-3/8” orifice at the flowline, a riser pipe, and a riser outlet. DB-1 also includes 3 Spillways including an existing 36-inch CMP riser, a new 36-inch riser, and an earthen spillway at the low side of the basin. See Figure 12 of the Drainage Report for details showing the modifications being made as part of this project. The orifice and outlets in DB-1 were sized and placed at elevations to facilitate the storage of the WQV and provide a drawdown time between 24 to 48 hours during a water quality event. The Caltrans Infiltration Tool Calculations for DB-1 that provide the WQV, Water Surface Elevation to store the WQV, and orifice size can be found in Attachment 6.

Existing flows to STO1 & STO2 are currently treated through existing vegetation and stabilized vegetated slopes through overland sheet flows. The existing treatment in these areas are not currently claimed in the Caltrans database. The treatment in these areas are not be classified as existing TBMPs and the proposed TBMPs are described in the Treatment BMP Strategy section of this report.

**Existing Treatment BMPs**

There are no existing Caltrans approved TBMPs providing treatment to this project. The existing detention basin, described in the Project Description subsection of Section 1, was not accepted by Caltrans and will be modified during the Project, therefore it will not be considered as an existing TBMP.
3. Construction Site BMPs to be used on Project

This Project will be constructed under the City of Placerville Notice of Intent (NOI); therefore, the City of Placerville’s policies will govern the construction-site BMP strategy. The temporary water pollution control plans have been submitted to the City for review and concurrence.

**Risk Level Determination**

The Project will disturb more than 1 acre of soil. Therefore, it is required to comply with the Construction General Permit (CGP), Order No. 2009-0009-DWQ and subsequent amendments. Projects subject to the CGP must complete a risk-level determination to determine the level of monitoring, sampling, and requirements for discharges from the Project.

The sediment risk is determined from the product of the rainfall runoff erosivity factor (R), the soil erodibility factor (K), and the length-slope factor (LS). Based on the estimated construction schedule and location of the Project, the U.S. Environmental Protection Agency (EPA) erosivity calculator calculated an R factor value of 48.52. The Caltrans “Water Quality Planning Tool” identifies the maximum K and LS values within the Project area as 0.32 and 4.5, respectively. The product of the R, K, and LS values is 69.9, which is within the range of 15-75, therefore the sediment risk is classified as medium.

Hangtown Creek, Weber Creek, and the South Fork American River are all classified as having a low receiving water risk because they don’t have the combined existing beneficial uses of MIGR, COLD, and SPWN, and because they are not identified as being impaired for sediment.

The medium sediment risk and low receiving water risk results in the Project being classified as risk level 2.

**Construction Site BMP Quantities**

The quantities of temporary construction-site BMPs are provided in Table 5.

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Item Description</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>130100</td>
<td>Job Site Management</td>
<td>LS</td>
<td>1</td>
</tr>
<tr>
<td>130300</td>
<td>Prepare Storm Water Pollution Prevention Plan</td>
<td>LS</td>
<td>1</td>
</tr>
<tr>
<td>130310</td>
<td>Rain Event Action Plan</td>
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<td>Storm Water Sampling and Analysis Day</td>
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<tr>
<td>130330</td>
<td>Storm Water Annual Report</td>
<td>EA</td>
<td>2</td>
</tr>
</tbody>
</table>
A Storm Water Pollution Prevention Plan (SWPPP) is required for this Project because the Project's DSA is greater than 1 acre. The SWPPP will be prepared by the Contractor for approval by the City.

Rain Event Action Plans are prepared by the Contractor prior to an anticipated rain event to describe the strategy for implementation of construction-site BMPs and the method to ensure runoff from the Project does not impact receiving waters. Stormwater sampling analysis is performed at discharge locations during qualifying storm events. The samples collected are tested for compliance with pH and turbidity numeric action levels. Storm Water Annual Reports are a collection and summary of all SWPPP-related activities; the reports include results of sampling and monitoring, corrective actions, and any other activities to demonstrate compliance with the CGP.

Temporary Soil Stabilization BMPs

Temporary hydraulic mulch will be placed on disturbed soils, stockpiles and areas of temporary inactivity to provide temporary stabilization during construction.

Temporary Sediment Control BMPs

Temporary check dams will be placed within the proposed unlined ditches and swales to reduce flow velocity and prevent scouring. Temporary drainage inlet protection will be placed at all proposed drainage inlets and existing inlets near work areas to prevent debris from entering drainage facilities. Fiber rolls will be placed along disturbed slopes to reduce sheet flow velocities and around stockpiles to prevent runoff of sediment-laden flows.

An active treatment system will not be used for stormwater or non-stormwater discharges.
Temporary Tracking Control BMPs

Temporary construction entrances will be located at all staging locations to prevent sediment or debris from being tracked onto the roadway. Street sweeping is provided to remove debris from the roadway during construction.

Non-Stormwater Management

Dewatering will not be needed during Project construction. Temporary creek or clear water diversion is not anticipated to be necessary because the channels are expected to be dry during construction. Non-stormwater management measures necessary for the Project are covered under job site management.

Waste Management & Materials Pollution Control

Temporary concrete washout will be used to address waste from concrete placement and mortar mixing. All other waste management and materials pollution control needs are addressed by the BMPs proposed for the Project and as included in job site management.

Job Site Management

A Bid Item for job site management is provided consistent with the standard specifications to cover additional BMPs needed for the Project, including spill prevention and control, material management, waste management, and non-stormwater management. Job site management, along with water pollution control, can also be used as contingency if additional line-item BMPs beyond those quantified are needed.

4. Maintenance BMPs

No Drainage inlet markers are required for this Project because the proposed inlet is in an area inaccessible to pedestrian and bicycle traffic. The Project will include a maintenance-vehicle pullout, and graded all-weather surface into the detention basin to facilitate long term BMP maintenance.

5. Other Water Quality Requirements and Agreements

Other Water Quality Requirements and Agreements are not required for the Project.

6. Permanent BMPs

Rapid Stability Assessment (RSA)

The Project’s NNI is less than 1 acre and new impervious portions of the Project do not drain into a stream crossing within the project limits, therefore, the Project is not subject to a rapid stability assessment.

Design Pollution Prevention (DPP) BMP Strategy

A DPP BMP Strategy is not required for this project. See Checklist DPP-1 in Attachment 14.
Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

The DPP BMP strategy includes using the permanent stormwater treatment BMPs to address increases in the volume and velocity of flows. DPP BMPs will be implemented to prevent downstream erosion, minimize potential velocity increases, stabilize slopes, and minimize erosion potential. The detention basin is designed to accommodate runoff from this Project, 03-372821, and meter excess flows from an engineered water quality outlet. The detention basin is sized to prevent an increase of flow during the 10-year, 25-year, and 100-year storm events for a 3-hour and 24-hour duration at two downstream junctions north of US 50.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

Existing slopes within the Project limits will be modified. Of the Project’s 3.64 acres of DSA, 1.65 acres consist of slopes 4:1 (H:V) or flatter, 0.41 acres consist of slopes greater than 4:1 (H:V) and less than 2:1 (H:V), and 1.58 acres consist of slopes 2:1 (H:V) or steeper. Concentrated flows will be managed by collecting flows in new or modified stabilized drains or channels.

Permanent slope and soil stabilization will be achieved through the use of standard erosion control measures. The erosion control types and locations are shown on the Erosion Control Plans included in the contract plan set. Disturbed soils will be stabilized by applying hydraulic biotic growth medium with fiber reinforced matrix and fiber rolls. The hydraulic mix includes a mixture of native annual wildflowers, annual and perennial grasslands, mixed lowland pioneers, and mixed montane pioneers, which were identified using Caltrans’ TransPlant database as appropriate for the Project corridor. Permanent irrigation is not proposed.

Beyond the roadway surface, the only hard surfaces proposed are rock slope protection for concentrated flows. Other hard surfaces, such as concreted rock slope protection, are not proposed.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

New drainage facilities and modifications to existing drainage facilities are necessary to direct or intercept surface flow because the Project will modify existing slopes. These drainage improvements include placing a new drainage inlet and outfall. The new drainage inlet and outfall will be located between Highway 50 and the Ray Lawyer Drive on-ramp and is proposed to prevent cross flow and the spread of stormwater beyond the shoulder during the design storms.

New drainage facilities are designed with slopes which achieve self-cleaning velocities, and flat enough to prevent downstream erosion. Flared end sections with outlet protection (e.g., rock slope protection) are placed at outfalls to reduce flow velocities and prevent erosion. The majority of the Project drainage area will flow to the basin between the eastbound Ray Lawyer Drive off-ramp and the eastbound lanes of US 50. The proposed drainage improvements are shown on the Drainage Plans included in the contract plan set.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

Existing vegetation will be preserved to the maximum extent practicable and in accordance with any environmental permits/agreements.

Treatment BMP Strategy, Checklist T-1

This Project is required to consider implementation of treatment BMPs because the Project directly discharges to surface waters and results in an increase of 1 acre or more of NIS. The Project’s watershed does not have a prescriptive treatment BMP requirement or a TMDL for litter/trash. There
are also no Targeted Design Constituents (TDC) associated the Project’s receiving waters. Under the Caltrans MS4 permit applicable to this Project, a goal of the Project is to treat impervious surface to the maximum extent practicable.

The project includes three Contributing Drainage Areas (CDA's) which are identified by their discharge points; DB-1, STO-1 and STO-2, consistent with the project's Drainage Report. Detention Basin 1 and Bioswale 1 directly treat flows from DB-1 and STO-2. STO-1 is indirectly treated by capacity within Detention Basin 1.

The project's PCTA is equal to 1.11 acres. The project treats 100% of the required PCTA. One Biofiltration Swale and one Detention Basin are deployed to treat pavement runoff treating 3.01 acres. Therefore, the project generates 1.9 acres of Alternative Compliance. Alternative Compliance will be subject to approval by the RWQCB.

Biofiltration Swales/Strips, Checklists T-1, Parts 1 and 3

Biofiltration Swale 1 (BIOSWL-1) will treat 0.27 acres of new impervious are from this Project. The proposed BIOSWL-1 is a 100 foot long v-shaped swale with 4:1 side-slopes and 6.0% flowline slope. BIOSWL-1 will provide treatment for the calculated WQF of 0.05 cfs. The Bioswale Design Program Calculations for BIOSWL-1 are included in Attachment 5. BIOSWL-1 in its final condition will be vegetated with grass to provide flow-based treatment.

Detention Devices, Checklists T-1, Parts 1 and 4

Detention Basin 1 (DB-1) will treat 0.74 acres of new impervious area from this Project and an additional 2.0 acres of existing impervious area from outside the Project Limits. The proposed DB-1 has 4:1 side slopes and a 1.9% slope along its grass lined based for added low flow treatment. DB-1 will provide treatment for a calculated WQV of 11,166 cf. The supporting Caltrans Infiltration Tool Calculations for DB-1 are included in Attachment 6.

See Table 5 below for a summary of each Treatment BMP included in the Project.
### Table 5: Individual Treatment BMP Summary

<table>
<thead>
<tr>
<th>BMP ID No.</th>
<th>BMP Type</th>
<th>US-50 Station</th>
<th>Treated Pervious Area (acres)</th>
<th>Treated Impervious Area (acres)</th>
<th>BMP Size (acres)</th>
<th>WQV (cf)</th>
<th>% of WQV Treated</th>
<th>WQF Treated (cfs)</th>
<th>% of WQF Treated</th>
<th>Beg. Latitude, Longitude</th>
<th>End Latitude, Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB-1</td>
<td>Detention Basin</td>
<td>561+79.21 TO 564+50.43</td>
<td>1.27</td>
<td>2.74</td>
<td>0.05</td>
<td>11,166</td>
<td>100%</td>
<td>0</td>
<td>0</td>
<td>38°43'30.15&quot;N 120°49'36.20&quot;W</td>
<td>38°43'34.23&quot;N 120°49'31.43&quot;W</td>
</tr>
<tr>
<td>BIOSWL-1</td>
<td>Bioswale</td>
<td>571+18.25 TO 572+29.81</td>
<td>0.86</td>
<td>0.27</td>
<td>0.01</td>
<td>0</td>
<td>0</td>
<td>0.05</td>
<td>100%</td>
<td>38°43'40.88&quot;N 120°49'24.19&quot;W</td>
<td>38°43'42.73&quot;N 120°49'22.18&quot;W</td>
</tr>
</tbody>
</table>

**Total Area to be Treated (acre)**

|              | 2.53           | 3.01(1)                   |

**Notes:**

(1) The PCTA required for this project is 1.11 acres as shown in Table 1 on page 3. The Treatment BMP’s, DB-1 and BIOSWL-1, treat a total of 3.01 acres of contributing drainage area.
Treatment BMPs: Summary of Checklist T-1, Part 1

The following is a summary of the checklist answers:

- The Project’s watershed does not have a prescriptive treatment BMP requirement or a TMDL for litter/trash.

- Traction sand is not used more than twice a year, so sand trap inlets are not being considered.

- According to the Western Placerville Interchange Project Phase 2.2 (WRECO, August 6, 2020), the Project is observed to have infiltration rates that match HSG D soils. HSG D soils have the highest runoff potential and are typically made up of mostly clays or shallow soils with nearly impermeable sub-horizons near the surface. Due to this condition, Infiltration Devices are not considered to be effective, even with amended soils, and Biofiltration Strips/Swales is considered to be an effective method of treatment for this Project.

- There are no Targeted Design Constituents (TDC) associated with the Project receiving waters.
List of Attachments

Attachment 1: Vicinity Map (per PPDG, Section 6.4.8.1)
Attachment 2: Evaluation Documentation Form (EDF) (per PPDG, Section E-10)
Attachment 3: Risk Level Determination Documentation (per PPDG, Section 6.4.4.2)
Attachment 4: SWDR Attachment for SMARTS Input (per PPDG, Section E-11)
Attachment 5: Bioswale Design Program Calculations
Attachment 6: Caltrans Infiltration Tool Calculations for DB-1
Attachment 7: Drainage Plan Sheets
Attachment 8: Checklist SW-1, Site Data Sources (per PPDG, Section 6.4.3.1)
Attachment 9: Checklist SW-2, Stormwater Quality Issues Summary (per PPDG, Section 6.4.3.1)
Attachment 10: Checklist SW-3, Measures for Avoiding or Reducing Potential Stormwater Impacts (per PPDG, Section 6.4.3.1)
Attachment 11: Checklist T-1, Part 1 (Consideration of Treatment BMPs) (per PPDG, Appendix B)
Attachment 12: Checklist T-1, Part 3 (Biofiltration Swales / Biofiltration Strips) (per PPDG, Appendix B)
Attachment 13: Checklist T-1, Part 4 (Detention Devices) (per PPDG, Appendix B)
Attachment 14: Checklist DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) (per PPDG, Appendix A)
Attachment 15: Construction Site BMP Consideration Form (per PPDG, Appendix C)
Attachment 16: Checklist CS-1, Parts 1–6 (Construction Site BMPs) (per PPDG, Appendix C)
ATTACHMENT 1:

Vicinity Map
ATTACHMENT 2:
Evaluation Documentation Form (EDF)
## Evaluation Documentation Form

**DATE:** August 20, 2020  
**Project ID (EA):** 0319000152 (03-372821)

### Table: Evaluation Criteria

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Yes ✓</th>
<th>No ✓</th>
<th>Supplemental Information for Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Begin Project evaluation regarding requirement for implementation of Treatment BMPs</td>
<td>✓</td>
<td></td>
<td>See Figure 4-1, Project Evaluation Process for Consideration of Treatment BMPs. Continue to 2.</td>
</tr>
</tbody>
</table>
| 2.  | Is the scope of the Project to install Treatment BMPs (e.g., Alternative Compliance or TMDL Compliance Units)? | ✓     |      | If Yes, go to 8.  
If No, continue to 3. |
| 3.  | Is there a direct or indirect discharge to surface waters?                | ✓     |      | If Yes, continue to 4.  
If No, go to 9. |
| 4.  | As defined in the WQAR or ED, does the project:  
   a. discharge to Areas of Special Biological Significance (ASBS), or  
   b. discharge to a TMDL watershed where Caltrans is named stakeholder, or  
   c. have other pollution control requirements for surface waters within the project limits? | ✓     |      | If Yes to any, contact the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to discuss the Department’s obligations, go to 8 or 5. (Dist./Reg Coordinator initials)  
If No to all, continue to 5. |
| 5.  | Are any existing Treatment BMPs partially or completely removed?  
(ATA Condition 1, Section 4.4.1) | ✓     |      | If Yes, go to 8 AND continue to 6.  
If No, continue to 6. |
| 6.  | Is this a Routine Maintenance Project?                                    | ✓     |      | If Yes, go to 9.  
If No, continue to 7. |
| 7.  | Does the project result in an increase of one acre or more of new impervious surface (NIS)? | ✓     |      | If Yes, go to 8.  
If No, go to 9. |
| 8.  | Project is required to implement Treatment BMPs.                          |       |      | Complete Checklist T-1, Part 1. |
| 9.  | Project is not required to implement Treatment BMPs.  
[pencil](Dist./Reg. Design SW Coord. Initials)  
[pen](Project Engineer Initials)  
**09-02-2020**(Date) |       |      | Document for Project Files by completing this form and attaching it to the SWDR. |
ATTACHMENT 3:
Risk Level Determination
Documentation
R-Value

The R-Value is 48.52 as determined by the EPA *Rainfall Erosivity Factor Calculator for Small Construction Sites* as shown below.

Click the “Calculate R Factor” button below to calculate an R Factor for your small construction project.

### Facility Information

<table>
<thead>
<tr>
<th>Start Date: 02/01/2021</th>
<th>Latitudes 38.7278</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Date: 11/30/2021</td>
<td>Longitudes -120.8240</td>
</tr>
</tbody>
</table>

### Calculation Results

Rainfall erosivity factor (R Factor) = **48.52**

A rainfall erosivity factor of 5.0 or greater has been calculated for your site’s period of construction.

*You do NOT qualify for a waiver from NPDES permitting requirements and must seek Construction General Permit (CGP) coverage.* If you are located in an area where EPA is the permitting authority, you must submit a Notice of Intent (NOI) through the NPDES eReporting Tool (Net). Otherwise, you must seek coverage under your state’s CGP.
K-Value

The K-Value is 0.32 as determined by the Caltrans Water Quality Planning Tool as shown below.
**LS-Value**

The LS-Value is 4.50 as determined by the *Caltrans Water Quality Planning Tool* as shown below.
Risk Determination Worksheet – Sediment Risk

<table>
<thead>
<tr>
<th>Sediment Risk Factor Worksheet</th>
<th>Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A) R Factor</strong></td>
<td></td>
</tr>
<tr>
<td>Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I130) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. &quot;Isoerodent&quot; maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.</td>
<td></td>
</tr>
<tr>
<td><a href="http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm">http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm</a></td>
<td></td>
</tr>
<tr>
<td>R Factor Value</td>
<td>48.52</td>
</tr>
</tbody>
</table>

**B) K Factor (weighted average, by area, for all site soils)**

The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.

**Site-specific K factor guidance**

| K Factor Value | 0.32 |

**C) LS Factor (weighted average, by area, for all slopes)**

The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.

<table>
<thead>
<tr>
<th>LS Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS Factor Value</td>
</tr>
</tbody>
</table>

Watershed Erosion Estimate (=R*K*L) in tons/acre

<table>
<thead>
<tr>
<th>Site Sediment Risk Factor</th>
<th>Entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Sediment Risk: &lt; 15 tons/acre</td>
<td></td>
</tr>
<tr>
<td>Medium Sediment Risk: &gt;=15 and &lt;75 tons/acre</td>
<td></td>
</tr>
<tr>
<td>High Sediment Risk: &gt;= 75 tons/acre</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>69.8688</td>
</tr>
</tbody>
</table>
**Risk Determination Worksheet – Receiving Water Risk**

<table>
<thead>
<tr>
<th>Receiving Water (RW) Risk Factor Worksheet</th>
<th>Entry</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Watershed Characteristics</td>
<td>yes/no</td>
<td></td>
</tr>
<tr>
<td>A.1. Does the disturbed area discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment (For help with impaired waterbodies please visit the link below) or has a USEPA approved TMDL implementation plan for sediment?:</td>
<td>no</td>
<td>Low</td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN &amp; COLD &amp; MIGRATORY? (For help please review the appropriate Regional Board Basin Plan)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="http://www.waterboards.ca.gov/waterboards_map.shtml">http://www.waterboards.ca.gov/waterboards_map.shtml</a></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Risk Determination Worksheet – Combined Risk**

<table>
<thead>
<tr>
<th>Combined Risk Level Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Sediment Risk**

<table>
<thead>
<tr>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 1</td>
<td>Level 2</td>
</tr>
<tr>
<td></td>
<td>Level 2</td>
<td>Level 3</td>
</tr>
</tbody>
</table>

**Receiving Water Risk**

<table>
<thead>
<tr>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Level 2</td>
</tr>
<tr>
<td>Level 2</td>
<td>Level 3</td>
</tr>
</tbody>
</table>

**Project Sediment Risk:** Medium

**Project RW Risk:** Low

**Project Combined Risk:** Level 2
ATTACHMENT 4:

SWDR Attachment for SMARTS Input
DESIGN INFORMATION FOR CONSTRUCTION

The following information is based on the PS&E design plans and specifications. If contract amendments or change orders are made after the design is complete, then the information should be updated by construction, as appropriate.

Project ID (EA): 0319000152 (03-372821)

Enter the following data into the CGP SMARTS Notice of Intent-Site Information page.

1. Total site size (acres); for project area use Caltrans RW x post mile limits (begin-end) on plan sheets.
   Total site size 17.19 acres

2. Enter latitude and longitude in decimal degrees to 5 significant figures. Use a location from the center of the project. This information can be obtained from Survey information, GPS units, Google earth, CT Earth, or other mapping software.
   Latitude: 38.7278
   Longitude: -120.8240

3. Total Area to be Disturbed (total Disturbed Soil Area (DSA)): This information is already calculated and can be taken from SWDR Section 1. Describe in acres.
   DSA 3.64 acres

4. Imperviousness before Construction (percentage) - This is calculated as the total impervious area of the project area divided by the total project area (see total site size), multiplied by 100. The impervious area is all paved areas or hard surfaces within the project limits.
   Impervious area before construction % 33.4

5. Percent of total disturbed (percentage); This should be calculated by dividing the total disturbed soil area by the total project area and multiply by 100.
   Percent of Total disturbed area % 19.4

6. Imperviousness after Construction (percentage), This should be calculated by adding all impervious area paved and hard surfaces based on the final design within project limits from above and dividing by the total project area from above multiply by 100.
   Impervious area after construction % 37.8

7. Mile Post Marker, enter the approximate post mile at the center of the project or take the average of the “begin” and “end” post mile markers from the title sheet.
   Mile post Marker 16.6
8. Is the construction site part of a larger common plan of development? Yes or No; in most cases mark No for Caltrans projects, as this is intended for developers (in accordance with the EPA definitions referenced by the CGP in 40 CFR title 22). This clarification is based on direction from the State Board, see Appendix G for the definition of common plan of development. Coordinate with the District/Regional Design Stormwater Coordinator to determine if there is a special case project where the common plan of development applies. No X

9. Name of development. Mark “Not Applicable (N/A)” in most cases.

   Name of plan or development: N/A

10. Estimated Construction Commencement Date, mm/dd/yyyy. The PE provides the estimated construction start date from the cover of the SWDR. The actual construction start date should be used to input into SMARTS. After the contract is awarded, the RE will use an updated start date (if different) when entering in SMARTS. The RE needs to be aware of the original date provided by Design, as this date was used to calculate the design information including the Risk Level Determination. If the actual start date is different, construction should coordinate with the PE to determine if the Risk Level has changed.

    Estimated Construction Commencement Date, 02/01/2021.

11. Estimated Complete Grading Date/Complete Project Date; The PE provides the estimated construction completion date from the cover of the SWDR to be used for both of these inputs. After the contract is awarded, the RE will use an updated completion date (if different) when entering in SMARTS. The RE needs to be aware of the original completion date provided by Design, as this date was used to calculate the design information including the Risk Level Determination. If the completion date is different, construction should coordinate with the PE to determine if the Risk Level has changed.

    Estimated Complete Grading Date/Complete Project: 11/31/2021. Use the same date for both inputs, unless instructed otherwise.

12. Does the Stormwater from the construction site discharge directly or indirectly into waters of the United States?

    Indirect discharge _Yes_____ - If yes, list name(s) of receiving water(s)  Weber Creek ________

    Direct discharge _No_____ - If yes, list name(s) of receiving water(s) N/A ____________
13. Risk Level; the combined project risk level is calculated using the sediment risk factor and the water body risk factor to give one overall project risk level. Use the Caltrans risk level determination guidance, (see the Stormwater design web page). Attach all risk calculations.

R factor value 48.52
K factor value 0.32
LS factor value 4.5

Receiving water risk comes from the state water resources control board mapping of water bodies for 303-d listing or TMDLs for sediment or water body with the beneficial use of cold and spawn and migratory. The input will either be high= yes and low=no;

Receiving water risk No, (yes or no)

The dates used for determining the project risk level and other design elements of the project required for CGP compliance are dependent on having the same sediment risk factor. This is a critical element for compliance, as modifying the estimated construction dates may cause the sediment risk factor to change and ultimately modify the overall project risk factor. This could impact the projects CGP compliance requirements and the assumptions used for the design documents and engineers estimate.

14. Post Construction: The PE provides project information related to Municipal Separate Storm Sewer System (MS4) areas.

Is the project located within a permitted Phase I or Phase II MS4 area? Yes

Does the Phase I or Phase II MS4 have an approved Stormwater Management Plan (SWMP) that includes post-construction requirements? Yes

Contact the District/Regional NPDES Coordinator with any questions.

15. Provide electronic copy of plan sheets in .pdf format that can be loaded to SMARTS, burn a CD for the RE to use for the project. The Title sheet can be used as the site map.

16. Methodology for obtaining the CGP NOT decided by the PDT, see SWDR Section 6 text for methodology text and computational proof as appropriate, circle one. See SWRCB bulletin for details: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/bulletin_2013_1.pdf
   a. 70% final cover method: Attach photo documentation X
   b. RUSLE II: Attach computational proof and photo documentation
   c. Other custom method if coordinated with local regional board, attach photo documentation or other proof as necessary.
ATTACHMENT 5:
Bioswale Design Program Calculations
**BIOSWALE (Bioswale Design Program)**

Calculated by: **Ryan Ruddick**  
Date: **5/5/2020**

---

**Paved area contributing to bioswale:**  
\[ A_p = 0.2699 \text{ ac} \]

**Unpaved area contributing to bioswale (total area typically < 10 acres):**  
\[ A_u = 0.8560 \text{ ac} \]

**Runoff coefficient for paved areas (PPDG Table 5-3) (0.90 maximum):**  
\[ C_p = 0.70 \]

**Runoff coefficient for unpaved areas (HDM Figure 819.2A) (0.90 maximum):**  
\[ C_u = 0.10 \]

**Comments:** Runoff coefficient for unpaved areas per PPDG (Updated April 19; Table 5-3, Per PPDG Section 5.3.3.3 HDM 819.2 overestimates the WQF and requires PE to use of Table 5-3).

---

**Rainfall Intensity for Q25 (from IDF curves):**  
\[ I_{25} = 5.27 \text{ in/hr} \]

**Comments:** Rainfall intensity for WQF to be 0.20 in/hr.

---

**Open channel calculation for Q25:**

- **Manning’s n (0.05 by HDM table 864.3A):**  
  \[ n = 0.050 \]

- **Swale longitudinal slope (between 0.25% and 6%, but 1% - 2% is preferred):**  
  \[ S_L = 6.00\% \]

- **Side slopes \( z : n \), where \( z = 4 \) or flatter, R or L looking downstream:**  
  \[ z_L = 4 \]
  \[ z_R = 4 \]

- **Width at invert (0 ft for ditches, and between 2 and 10 ft for trapezoidal channels):**  
  \[ b = 0.00 \text{ ft} \]

- **Resulting Q25 (HDM-819(c) requires a multiplier for Q25 equal to 1.1):**  
  \[ Q_{25} = 1.59 \text{ cfs} \]

- **Velocity for Q25 (maximum is 4 ft/s if not by-passed):**  
  \[ V_{25} = 2.45 \text{ ft/s} \]

- **Water top width for Q25:**  
  \[ T_{25} = 3.22 \text{ ft} \]

---

**Open channel calculation for QWQF (flow that must be treated by the bioswale):**

- **Manning’s n (0.20 for routinely mowed swales, 0.24 for infrequently mowed ones):**  
  \[ n = 0.24 \]

- **QWQF (“Water Quality Flow” in the swale):**  
  \[ Q_{WQF} = 0.05 \text{ cfs} \]

- **Q for internal calcs (use goal-seek to make it equal to QWQF by varying D_{WQF}):**  
  \[ Q = 0.05 \text{ cfs} \]

- **Depth of flow for Q_{WQF}:**  
  \[ D_{WQF} = 0.20 \text{ ft} \]

- **Velocity for QWQF (maximum is 1 ft/s):**  
  \[ V_{WQF} = 0.32 \text{ ft/s} \]

---

**Hydraulic Residence Time Check (HRT):**

- **Length of bioswale:**  
  \[ L = 100.00 \text{ ft} \]

---

**Hydraulic Residence Time (minimum is 5 min):**  
\[ HRT = \frac{L}{V_{WQF}} / 60 = 5.23 \text{ min} \]

**Must satisfy:** \[ HRT / (D_{WQF} \cdot V_{WQF}) \geq 1300 \text{ sec}^2/\text{ft}^2 : \]  
\[ 4968 \]

**If the criteria for the Bioswale cannot be met, three options are available:**

i) Consider it a Pollution Prevention BMP instead of a Treatment BMP;  
ii) Consider an alternative Treatment BMP at that location;  
iii) Petition the RWQCB for a reduced WQF intensity (see section 2.4.2.2).

---

Prepared by: **Fernando Manzanera, Caltrans District 1, October 2017**

Sources:  
- Storm Water Quality Handbooks Project Planning and Design Guide (PPDG), July 2017
ATTACHMENT 6:
Caltrans Infiltration Tool
Calculations for DB-1
# DRAINAGE AREA ANALYSIS

## Drainage Area Information

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>WPI Phase 2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>District-Co-Route:</td>
<td>PM:</td>
</tr>
<tr>
<td>Project ID (EA):</td>
<td>RWQCB:</td>
</tr>
<tr>
<td>DA Name (ID):</td>
<td>DB-1</td>
</tr>
<tr>
<td>Prepared by:</td>
<td>Ryan Ruddick</td>
</tr>
<tr>
<td>Date:</td>
<td>August 12, 2020</td>
</tr>
</tbody>
</table>

## Analysis Information

<table>
<thead>
<tr>
<th>Design Rainfall Depth (PCP):</th>
<th>1.13 in (85th percentile, 24-hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall Distribution:</td>
<td>CA-3</td>
</tr>
<tr>
<td>Dimensionless Unit Hydrograph:</td>
<td>PRF 484 (Default)</td>
</tr>
<tr>
<td>Results Display Units:</td>
<td>U.S. Customary</td>
</tr>
</tbody>
</table>

## RESULTS

### Summary

#### Areas

<table>
<thead>
<tr>
<th>Area</th>
<th>w/o Amdt</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impervious Area (Aimp):</td>
<td>2.74 ac</td>
<td>2.74 ac</td>
</tr>
<tr>
<td>Pervious Area (Aperv):</td>
<td>1.46 ac</td>
<td>1.46 ac</td>
</tr>
<tr>
<td>Total Area (At):</td>
<td>4.2 ac</td>
<td>4.2 ac</td>
</tr>
</tbody>
</table>

#### Volumes

<table>
<thead>
<tr>
<th>Volume</th>
<th>w/o Amdt</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall Volume (Vrain):</td>
<td>17260 ft³</td>
<td>17260 ft³</td>
</tr>
<tr>
<td>Abstraction Volume (Vabs):</td>
<td>5301 ft³</td>
<td>5301 ft³</td>
</tr>
<tr>
<td>Incidental Volume (Vinc):</td>
<td>11960 ft³</td>
<td>11960 ft³</td>
</tr>
<tr>
<td>Infiltration Volume (Vinf):</td>
<td>0 ft³</td>
<td>0 ft³</td>
</tr>
<tr>
<td>Flow-Through Treated Volume (Vftt):</td>
<td>11960 ft³</td>
<td>11960 ft³</td>
</tr>
<tr>
<td>Bypass Volume (Vbp):</td>
<td>0 ft³</td>
<td>0 ft³</td>
</tr>
<tr>
<td>Runoff Volume (Vroff):</td>
<td>11960 ft³</td>
<td>11960 ft³</td>
</tr>
</tbody>
</table>

#### Treated Areas

<table>
<thead>
<tr>
<th>Area</th>
<th>w/o Amdt</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Treated Volume (Vtt):</td>
<td>11166 ft³</td>
<td>11166 ft³</td>
</tr>
<tr>
<td>Total Treated Area (Att):</td>
<td>NC ac</td>
<td>NC ac</td>
</tr>
</tbody>
</table>

### Comments

---

---

---

---

---
## SURFACE MODELS

### Runoff Area [ID: 1]

<table>
<thead>
<tr>
<th>Surface Type:</th>
<th>Runoff Area</th>
<th>SID:</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td>Runoff Area that contributes to DB-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drains to Surface:</td>
<td>Detention Basin [ID: 2]</td>
<td>DTID:</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>w/o Amdt</th>
<th>Final</th>
<th>[units]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impervious Area (Aimp):</strong></td>
<td>119562.41</td>
<td>119562.41</td>
</tr>
<tr>
<td><strong>Pervious Area (Aperv):</strong></td>
<td>55301.7</td>
<td>55301.7</td>
</tr>
<tr>
<td><strong>Time of Concentration (Tc):</strong></td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Volumetric Runoff Coef (Rv):</strong></td>
<td>0.6781</td>
<td>0.6781</td>
</tr>
</tbody>
</table>

### Results

Note: * Rv used is composite value determined using an Rv of 0.89 for Impervious and 0.22 for Pervious per PPDG Table S-2

#### Areas

<table>
<thead>
<tr>
<th>w/o Amdt</th>
<th>Final</th>
<th>[units]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impervious Area (Aimp):</strong></td>
<td>2.74</td>
<td>2.74</td>
</tr>
<tr>
<td><strong>Pervious Area (Aperv):</strong></td>
<td>1.27</td>
<td>1.27</td>
</tr>
<tr>
<td><strong>Total Area (At):</strong></td>
<td>4.01</td>
<td>4.01</td>
</tr>
<tr>
<td><strong>Contributing Drainage Area (Acd):</strong></td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

#### Volumes

<table>
<thead>
<tr>
<th>w/o Amdt</th>
<th>Final</th>
<th>[units]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Runon Volume (Vron):</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Rainfall Volume (Vrain):</strong></td>
<td>16,467</td>
<td>16,467</td>
</tr>
<tr>
<td><strong>Abstraction Volume (Vabs):</strong></td>
<td>5,301</td>
<td>5,301</td>
</tr>
<tr>
<td><strong>Incidental Volume (Vinc):</strong></td>
<td>11,166</td>
<td>11,166</td>
</tr>
<tr>
<td><strong>Infiltration Volume (Vinfl):</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Flow-Through Treated Volume (Vftt):</strong></td>
<td>11,166</td>
<td>11,166</td>
</tr>
<tr>
<td><strong>Bypass Volume (Vbp):</strong></td>
<td>11,166</td>
<td>11,166</td>
</tr>
<tr>
<td><strong>Runoff Volume (Vroff):</strong></td>
<td>11,166</td>
<td>11,166</td>
</tr>
</tbody>
</table>

#### PPDG Inputs

<table>
<thead>
<tr>
<th>w/o Amdt</th>
<th>Final</th>
<th>[units]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Treated Volume (Vtt):</strong></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Treated Area (Att):</strong></td>
<td>NC</td>
<td>NC</td>
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### Detention Basin [ID: 2]

<table>
<thead>
<tr>
<th>BMP Type:</th>
<th>Detention Basin</th>
<th>SID:</th>
<th>2</th>
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<tbody>
<tr>
<td>BMP Identifier Number:</td>
<td>DB-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drains to Surface:</td>
<td>[Outlet]</td>
<td>DTID:</td>
<td>-1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>w/o Amdt</th>
<th>Final</th>
<th>[units]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area at Top of Basin (At):</strong></td>
<td>8430</td>
<td>8430</td>
</tr>
<tr>
<td><strong>Area at Invert of Basin (Ai):</strong></td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Height of Basin (Hb):</strong></td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Height to Overflow Outlet (Hoo):</strong></td>
<td>3.03</td>
<td>3.03</td>
</tr>
</tbody>
</table>
### Water Quality Outlet Design

<table>
<thead>
<tr>
<th>Parameter</th>
<th>w/o Amdt</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area at Overflow Outlet (Aoo)</td>
<td>8380 ft²</td>
<td>8380 ft²</td>
</tr>
</tbody>
</table>

### Design Requirements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawdown Time (Td)</td>
<td>25.04 hr</td>
<td>25.04 hr</td>
</tr>
</tbody>
</table>

### Existing Soil Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSG Soil Type:</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Infiltration Rate (Ies):</td>
<td>0 in/hr</td>
<td>0 in/hr</td>
</tr>
<tr>
<td>Bulk Density (pes):</td>
<td>0 g/cm³</td>
<td>0 g/cm³</td>
</tr>
<tr>
<td>Specific Gravity of Particles (Ges):</td>
<td>0 g/cm³</td>
<td>0 g/cm³</td>
</tr>
</tbody>
</table>

### Amendment Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amendment Type:</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Infiltration Rate (ia):</td>
<td>0 in/hr</td>
<td>0 in/hr</td>
</tr>
<tr>
<td>Bulk Density (pa):</td>
<td>0 g/cm³</td>
<td>0 g/cm³</td>
</tr>
<tr>
<td>Specific Gravity of Particles (Ga):</td>
<td>0 g/cm³</td>
<td>0 g/cm³</td>
</tr>
</tbody>
</table>

### Amended & Compacted Soil Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement Depth (Da):</td>
<td>0 in</td>
<td>0 in</td>
</tr>
<tr>
<td>Incorporation Depth (Di):</td>
<td>0 in</td>
<td>0 in</td>
</tr>
<tr>
<td>Void Ratio (Eas):</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>w/o Amdt</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impervious Area (Aimp):</td>
<td>0.00 ac</td>
<td>0.00 ac</td>
</tr>
<tr>
<td>Pervious Area (Aper):</td>
<td>0.19 ac</td>
<td>0.19 ac</td>
</tr>
<tr>
<td>Total Area (At):</td>
<td>0.19 ac</td>
<td>0.19 ac</td>
</tr>
<tr>
<td>Contributing Drainage Area (Acd):</td>
<td>4.01 ac</td>
<td>4.01 ac</td>
</tr>
<tr>
<td>Volumes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Runoff Volume (Vron):</td>
<td>11,166 ft³</td>
<td>11,166 ft³</td>
</tr>
<tr>
<td>Rainfall Volume (Vrain):</td>
<td>794 ft³</td>
<td>794 ft³</td>
</tr>
<tr>
<td>Abstraction Volume (Vabs):</td>
<td>0 ft³</td>
<td>0 ft³</td>
</tr>
<tr>
<td>Incidental Volume (Vinc):</td>
<td>794 ft³</td>
<td>794 ft³</td>
</tr>
<tr>
<td>Infiltration Volume (Vinf):</td>
<td>0 ft³</td>
<td>0 ft³</td>
</tr>
<tr>
<td>Flow-Through Treated Volume (Vftt):</td>
<td>11,960 ft³</td>
<td>11,960 ft³</td>
</tr>
<tr>
<td>Bypass Volume (Vbp):</td>
<td>0 ft³</td>
<td>0 ft³</td>
</tr>
<tr>
<td>Runoff Volume (Vroff):</td>
<td>11,960 ft³</td>
<td>11,960 ft³</td>
</tr>
<tr>
<td>PPDG Inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Treated Volume (Vtt):</td>
<td>11,166 ft³</td>
<td>11,166 ft³</td>
</tr>
<tr>
<td>Total Treated Area (Att):</td>
<td>NC ac</td>
<td>NC ac</td>
</tr>
</tbody>
</table>
ATTACHMENT 7:

Drainage Plan Sheets
FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
## Erosion Control Quantities

<table>
<thead>
<tr>
<th>Fiber Rolls</th>
<th>Description</th>
<th>Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Fiber Rolls

<table>
<thead>
<tr>
<th>Sequence</th>
<th>MSG</th>
<th>Material Type</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fiber rolls must be installed after the roll with FINI has cured.

## Erosion Control Type 1

<table>
<thead>
<tr>
<th>Sequence</th>
<th>JGA</th>
<th>Application Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sequence</th>
<th>JGA</th>
<th>Application Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Seed Mix

<table>
<thead>
<tr>
<th>Botanical Name (Common Name)</th>
<th>Percent Termination (Minimum)</th>
<th>Pounds Pure Live Seed Per Acre (Slope Measurement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabares filipes (anchovy)</td>
<td>85</td>
<td>1</td>
</tr>
<tr>
<td>Agrostis capillaris (bluebunch)/</td>
<td>85</td>
<td>1</td>
</tr>
<tr>
<td>Arabares vespina (wild rye)</td>
<td>85</td>
<td>1</td>
</tr>
<tr>
<td>Festuca microstachys (three weeks fescue)</td>
<td>85</td>
<td>1</td>
</tr>
<tr>
<td>Lotus corniculatus (purple clover)</td>
<td>85</td>
<td>1</td>
</tr>
<tr>
<td>Lupinus nigricans (sky lupine)</td>
<td>85</td>
<td>1</td>
</tr>
<tr>
<td>Sphaeranthus indicus (purple coneflower)</td>
<td>85</td>
<td>1</td>
</tr>
</tbody>
</table>

## Erosion Control Legend

- **FCL-1**
ATTACHMENT 8:

Checklist SW-1, Site Data Sources
Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect available project reports and any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 6.4.3.2. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

<table>
<thead>
<tr>
<th>DATA CATEGORY/SOURCES</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Quality</td>
<td></td>
</tr>
<tr>
<td>• Caltrans. Water Quality Planning Tool</td>
<td>December 2019</td>
</tr>
<tr>
<td><a href="http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx">http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx</a></td>
<td></td>
</tr>
<tr>
<td>• Central Valley Regional Water Quality Control Board. Water Quality Control Plan for the Sacramento and San Joaquin River Basins.</td>
<td>Revised July 2016</td>
</tr>
<tr>
<td>• WRECO. Long Form – Stormwater Data Report for Western Placerville Interchanges Phase 2 (Project ID 0319000152)</td>
<td>August 2017</td>
</tr>
<tr>
<td>• Caltrans. Project Planning and Design Guide.</td>
<td>July 2017 (Updated April 2019)</td>
</tr>
<tr>
<td>• State Water Resources Control Board. Statewide Phase II Small MS4 General Permit. Order No. 2013-0001-DWQ</td>
<td>July 2013</td>
</tr>
<tr>
<td>Geotechnical</td>
<td></td>
</tr>
<tr>
<td>• Sierra Geotech. Supplemental Geotechnical Memo for Western Placerville Interchanges Phase 2.2</td>
<td>March 27, 2020</td>
</tr>
<tr>
<td>• Dokken. Initial Site Assessment</td>
<td>2010</td>
</tr>
<tr>
<td>Topographic</td>
<td></td>
</tr>
<tr>
<td>Data Category</td>
<td>Source</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Hydraulic</td>
<td>Dokken. Topographic survey file. Project ID 0314000301 (EA-03-37281)</td>
</tr>
<tr>
<td></td>
<td>WRECO. Drainage Report for Western Placerville Interchanges Project Phase 2.2</td>
</tr>
<tr>
<td>Climatic</td>
<td>National Oceanic and Atmospheric Administration. Climatography of the United States No. 20.</td>
</tr>
<tr>
<td></td>
<td>Western Regional Climate Center.</td>
</tr>
</tbody>
</table>
ATTACHMENT 9:

Checklist SW-2,

Stormwater Quality Issues Summary
The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Consult other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Design Stormwater Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR; do not discuss items identified as not applicable.

1. Determine the receiving waters for the project ✓ Complete □ NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern. □ Complete ✓ NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits, as shown by DWP. ✓ Complete □ NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc. ✓ Complete □ NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies. ✓ Complete □ NA
6. Determine if a 401 certification will be required. ✓ Complete □ NA
7. Identify rainy season. ✓ Complete □ NA
8. If applicable, determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves. ✓ Complete □ NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility and depth to groundwater. ✓ Complete □ NA
10. Determine contaminated soils within the project area. ✓ Complete □ NA
11. Determine the total disturbed soil area of the project. ✓ Complete □ NA
12. Describe the topography of the project site. ✓ Complete □ NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g., contractor’s staging yard, work from barges, easements for staging). □ Complete ✓ NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much? ✓ Complete □ NA
15. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches. □ Complete ✓ NA
16. Determine if project area has any slope stabilization concerns. ✓ Complete □ NA
17. Describe the local land use within the project area and adjacent areas. ✓ Complete □ NA
18. Evaluate the presence of dry weather flow. ✓ Complete □ NA
ATTACHMENT 10:

Checklist SW-3, Measures for Avoiding or Reducing Potential Stormwater Impacts
Checklist SW-3, Measures for Avoiding or Reducing Potential Stormwater Impacts

Prepared by: R.E.Y. Engineers, Inc.  Date:  August 20, 2020  District-Co-Route: 03-ED-50
PM: 16.4/16.8  Project ID/EA: 031900152 (03-372821)  RWQCB: Central Valley 5S

The PE should confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR; do not discuss items identified as not applicable.

Options for avoiding or reducing potential impacts during project planning include the following:

1. Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?
   - Yes ☑  No ☐  NA ☐

2. Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?
   - Yes ☑  No ☐  NA ☐

3. Can any of the following methods be utilized to minimize erosion from slopes:
   a. Disturbing existing slopes only when necessary?
      - Yes ☑  No ☐  NA ☐
   b. Minimizing cut and fill areas to reduce slope lengths?
      - Yes ☑  No ☐  NA ☐
   c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?
      - Yes ☑  No ☐  NA ☐
   d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?
      - No ☐  Yes ☑  NA ☐
   e. Avoiding soils or formations that will be particularly difficult to re-stabilize?
      - Yes ☑  No ☐  NA ☐
   f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?
      - Yes ☑  No ☐  NA ☐
   g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?
      - Yes ☑  No ☐  NA ☐
   h. Rounding and shaping slopes to reduce concentrated flow?
      - Yes ☑  No ☐  NA ☐
   i. Collecting concentrated flows in stabilized drains and channels?
      - Yes ☑  No ☐  NA ☐

4. Does the project design allow for the ease of maintaining all BMPs?
   - Yes ☑  No ☐

5. Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?
   - Yes ☑  No ☐

6. Can permanent stormwater pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction stormwater impacts?
   - Yes ☑  No ☐  NA ☐
ATTACHMENT 11:
Checklist T-1, Part 1
Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each BMP contributing drainage area within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project. This will help to determine if any changes to the BMP strategy are necessary, based on site specific information gathered during later phases. Use the responses to the questions as the basis of developing the narrative in Section 6 of the Stormwater Data Report to document that Treatment BMPs have been appropriately considered and/or incorporated.

Before evaluating an area for treatment capabilities or to incorporate a Treatment BMP, calculate the numeric sizing requirement for each contributing drainage area (WQV from the 85th percentile 24-hour storm event or WQF rate). Soil and geometric information for the project area will be necessary to use this Checklist.

Identify the overall project PCTA

Refer to Section 4.4 Treatment Areas for more information on defining these areas.

\[
PCTA = NNI + RIS + ATA (1 \text{ Impervious}) + ATA (2)
\]

- **NNI** = Net New Impervious Area
- **RIS** = Replaced Impervious Surface
- **ATA (1 Impervious)** = Additional Treatment Area required for existing Treatment BMPs that were removed or modified as part of the project
- **ATA (2)** = Additional Treatment Area required when NNI is 50 percent or greater than total project impervious

What is the PCTA for the project? **1.11 Acres (A in Table E-1)**

The PCTA is the impervious area required to be treated by the project. The PE is to incorporate BMPs until the summation of the treated impervious area of all the BMPs is equivalent to the PCTA for the Project.

Once this area and any ATA 1 (Pervious) has been treated, the project is in compliance with the post construction treatment requirement.

Total Maximum Daily Load (TMDL) Retrofit Projects

If the project is installing Treatment BMPs to only address TMDL requirements, then there is no required PCTA. The Treatment BMPs for a TMDL retrofit project should be designed to treat the impervious and pervious contributing drainage areas, as they are both eligible for compliance unit (CU) credits.
Overall Project Evaluation

Answer all questions, unless otherwise directed.

A. Overall Project Consideration

1. Is the project in a watershed with prescriptive Treatment BMP requirements in an adopted TMDL implementation plan or are there any other requirements for project area (e.g., District, Regional Board, Lawsuit)?

   If Yes, consult the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to determine if there are written agreements related to specific Treatment BMPs. In this case, determine if the rest of this checklist needs to be followed to address other post construction requirements. If not, document BMP(s) in the Individual Treatment BMP Summary Table, provide information on the basis of the BMP requirement and any regulatory coordination in the SWDR narrative, and complete Table E-2. Otherwise, continue.

   If No, continue.

2. Does the receiving water have a TMDL for litter/trash, or is there a region specific requirement related to trash?

   If Yes, first evaluate BMPs that can treat other pollutants and are considered to be full capture devices (GSRDs or other) for litter/trash. If other BMPs cannot be sited, consult with the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to determine if standalone full capture devices (GSRDs or other) are required to be incorporated. If standalone devices are required and no other Treatment BMPs are being considered, go to question 6 of “Individual BMP Evaluation”.

   If No, continue.

3. Is the project located in an area that uses traction sand more than twice a year?

   If Yes, first consider BMPs that can treat other pollutants and can capture traction sand. If other BMPs cannot be sited, consult the District/Regional Design Stormwater Coordinator to determine if standalone traction sand trap devices should be incorporated.

   If standalone devices are required and no other Treatment BMPs are being considered, go to question 6 of “Individual BMP Evaluation”. Otherwise, continue with this checklist to identify Treatment BMPs that provide traction sand and other pollutant removal, or to design Treatment BMPs in series.

   If No, continue.
B. Dual Purpose Facilities

Does the project have (or propose to include) any dual purpose facilities that could meet treatment requirements (e.g., Dry Weather Flow Diversion, flood control basins, etc.)?  

☐ Yes  ☐ No

If Yes and 100 percent of the PCTA and ATA 1 (Pervious) will be treated by the dual purpose facility, go to question 6 of “Individual BMP Evaluation”.

If Yes, but 100 percent of the PCTA and ATA 1 (Pervious) has not been addressed, continue.

If No, continue.

C. Evaluate overall project area for infiltration opportunities using existing and proposed roadside surfaces (DPP Infiltration Areas). Assure the DPP Infiltration Area is stabilized to handle highway drainage design flows, for both sheet and concentrated flows (See HDM Section 800).

Document DPP Infiltration Areas on the “Individual Treatment BMP Summary Table” located at the end of this checklist.

1. Based on site conditions, do the DPP Infiltration Areas infiltrate 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) for the project?  

☐ Yes  ☐ No

Yes, go to question 6 of “Individual BMP Evaluation”.

If No, account for area infiltrated and continue.

2. Can infiltration for these areas be increased by using soil amendments or other means?  

☐ Yes  ☐ No

If Yes, and 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) is infiltrated, go to question 6 of “Individual BMP Evaluation”.

If Yes, but 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) is not infiltrated, continue with this checklist to identify Treatment BMPs that will treat the remaining PCTA and ATA 1 (Pervious).

If No, continue.
Individual BMP Evaluation

Answer the following questions for each Treatment BMP location being considered. The following process must be followed until the PCTA and ATA 1 (Pervious) or desired treatment area (Alternative Compliance or TMDL CUs) has been achieved; for TMDL CUs, consider both impervious and pervious contributing drainage areas. Use the Individual Treatment BMP Summary Table at the end of the checklist to summarize the selected BMP(s) based on the findings of the following questions for each BMP contributing drainage area.

1. Infiltration Devices (Infiltration Basin, Trench, or other device)
   a. Can 100 percent of the BMP contributing drainage area WQV (or remaining WQV, if in series with a DPP Infiltration Area or other BMP) be infiltrated? □ Yes □ No
      If Yes, go to question 6.
      If No, continue.

2. LID flow through Devices (Biofiltration Strips, Swales, & Bioretention)
   a. Is this a TMDL retrofit project or is the project within a TMDL watershed or 303(d) impaired receiving water body area? □ Yes □ No
      If Yes, when designing the TBMP, determine the percent WQV infiltrated from both the impervious and pervious BMP contributing drainage areas.
      Consider using existing or amended soils:
      i. If infiltration is >50 percent, continue to b.
      ii. If infiltration is ≤50 percent, go to question 3.
      If No, continue to b.
   b. Can Biofiltration and Bioretention devices be designed to:
      □ Yes □ No
      i. Treat 100 percent of the WQF/WQV (or remainder, if in series with a DPP Infiltration Area or other BMP) from the BMP contributing drainage area, and
      ii. Meet the siting and design criteria of the Caltrans TBMP design guidance.
      If Yes, continue to c.
      If No, go to question 3.
   c. Biofiltration and Bioretention devices are considered to be an effective method of treatment, go to question 6.
3. Earthen type BMPs (Detention Devices, Media Filters, or other devices)

   a. Is this a TMDL retrofit project or is the project within a TMDL watershed or 303(d) impaired receiving water body area?  
      □ Yes  ✔ No

      If Yes, when designing the earthen type BMP, determine the percent WQV infiltrated from both the impervious and pervious BMP contributing drainage area. Consider using existing or amended soils:
      i. If infiltration is >50 percent, continue to b.
      ii. If infiltration is ≤50 percent, go to question 4.

      If No, continue to b.

   b. Can earthen type BMPs (standalone or in series with other approved Treatment BMPs) be designed to:
      ✔ Yes  □ No

      iii. Treat 100 percent of the WQV (or remainder, if in series with a DPP Infiltration Area or other BMP) from the BMP contributing drainage area, and

      iv. Meet the criteria of the Caltrans design guidance for the treatment device being considered.

      If Yes, continue to c.

      If No, go to question 4.

   c. Earthen type BMPs are considered to be an effective method of treatment, go to question 6.
4. Targeted Design Constituent (TDC)

This approach will compare the effectiveness of individual BMPs and allow the PE to use judgment when evaluating BMP feasibility (site constraints, safety, maintenance requirements, life-cycle costs, etc.).

a. Does the project discharge to a 303(d) impaired receiving water or a receiving water in a TMDL watershed where Caltrans is a named stakeholder?  
   □ Yes  □ No

   If Yes, is the identified pollutant(s) considered to be a TDC (check all that apply below)? Continue to b.
   □ sediments
   □ phosphorus
   □ nitrogen
   □ copper (dissolved or total)
   □ lead (dissolved or total)
   □ zinc (dissolved or total)
   □ general metals (dissolved or total)¹

   If No or if no TDC is identified, use Matrix A to select BMPs and go to question 5.

b. Treating Only Sediment. Is sediment a TDC?  
   □ Yes  □ No

   If Yes, use Matrix A to select BMPs and go to question 5.
   If No, continue to c.

c. Treating Only Metals. Are copper, lead, zinc, or general metals listed TDCs?  
   □ Yes  □ No

   If Yes, use Matrix B to select BMPs, and go to question 5.
   If No, continue to d.

d. Treating Only Nutrients. Are nitrogen and/or phosphorus listed TDCs?  
   □ Yes  □ No

   If Yes, use Matrix C to select BMPs, and go to question 5.
   If No, continue e.

e. Treating both Metals and Nutrients. Is copper, lead, zinc, or general metals AND nitrogen or phosphorous a TDC?  
   □ Yes  □ No

   If yes, use Matrix D to select BMPs, and go to question 5.
   If No, continue.

¹ General metals is a designation used by Regional Water Boards when specific metals have not yet been identified as causing the impairment.
### BMP Selection Matrix A: General Purpose Pollutant Removal

Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility, which includes life cycle costs. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. All BMPs shown are approved and may be used.

<table>
<thead>
<tr>
<th>BMP ranking for infiltration category:</th>
<th>Infiltration &lt; 20%</th>
<th>Infiltration 20% - 50%</th>
<th>Infiltration &gt; 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tier 1</strong></td>
<td>Bioretention (all)</td>
<td>Austin filter (earthen)</td>
<td>Austin filter (earthen)</td>
</tr>
<tr>
<td></td>
<td>Strip: HRT &gt; 5</td>
<td>Detention (unlined)</td>
<td>Detention (unlined)</td>
</tr>
<tr>
<td></td>
<td>Austin filter (concrete)</td>
<td>Infiltration basins</td>
<td>Infiltration basins</td>
</tr>
<tr>
<td></td>
<td>Delaware filter</td>
<td>Infiltration trenches</td>
<td>Infiltration trenches</td>
</tr>
<tr>
<td></td>
<td>OGFC</td>
<td>Biofiltration Strip</td>
<td>Biofiltration Strip</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bioretention (unlined)</td>
<td>Bioretention (unlined)</td>
</tr>
<tr>
<td><strong>Tier 2</strong></td>
<td>Strip: HRT &lt; 5</td>
<td>Austin filter (concrete)</td>
<td>Austin filter (concrete)</td>
</tr>
<tr>
<td></td>
<td>Biofiltration Swale</td>
<td>Delaware filter</td>
<td>Delaware filter</td>
</tr>
<tr>
<td></td>
<td>Detention (unlined)</td>
<td>Biofiltration Swale</td>
<td>Biofiltration Swale</td>
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<tr>
<td></td>
<td></td>
<td>Bioretention (lined)</td>
<td>Bioretention (lined)</td>
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<tr>
<td></td>
<td></td>
<td>OGFC</td>
<td>OGFC</td>
</tr>
</tbody>
</table>

All BMPs shown are considered effective. The PE should use professional judgment when selecting BMPs based on overall site design and feasibility.

### BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous

Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility, which includes life cycle costs. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. All BMPs shown are approved and may be used.

<table>
<thead>
<tr>
<th>BMP ranking for infiltration category:</th>
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<th>Infiltration 20% - 50%</th>
<th>Infiltration &gt; 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tier 1</strong></td>
<td>Austin filter (earthen)</td>
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<td>Austin filter (earthen)</td>
</tr>
<tr>
<td></td>
<td>Bioretention (unlined)</td>
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</tr>
<tr>
<td></td>
<td>Infiltration basins</td>
<td>Infiltration basins</td>
<td>Infiltration basins</td>
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<tr>
<td></td>
<td>Infiltration trenches</td>
<td>Infiltration trenches</td>
<td>Infiltration trenches</td>
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<tr>
<td></td>
<td>Biofiltration Strip</td>
<td>Biofiltration Strip</td>
<td>Biofiltration Strip</td>
</tr>
<tr>
<td></td>
<td>Bioretention (unlined)</td>
<td>Biofiltration Swale</td>
<td>Biofiltration Swale</td>
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<tr>
<td></td>
<td>OGFC</td>
<td>OGFC</td>
<td>OGFC</td>
</tr>
<tr>
<td><strong>Tier 2</strong></td>
<td>Strip: HRT &gt; 5</td>
<td>Austin filter (concrete)</td>
<td>Austin filter (concrete)</td>
</tr>
<tr>
<td></td>
<td>Biofiltration Swale</td>
<td>Bioretention (lined)</td>
<td>Bioretention (lined)</td>
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<tr>
<td></td>
<td>Detention (unlined)</td>
<td>Delaware filter</td>
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<td>Biofiltration Swale</td>
<td>Biofiltration Swale</td>
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<tr>
<td></td>
<td>OGFC</td>
<td>OGFC</td>
<td>OGFC</td>
</tr>
</tbody>
</table>

All BMPs shown are considered effective. The PE should use professional judgment when selecting BMPs based on overall site design and feasibility.
**BMP Selection Matrix C: Phosphorous and/or nitrogen is the TDC, but no metals are the TDC**

Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility, which includes life cycle costs. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. All BMPs shown are approved and may be used.

<table>
<thead>
<tr>
<th>Infiltration ranking</th>
<th>Tier 1</th>
<th>Tier 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration &lt; 20%</td>
<td>Austin filter (earthen)</td>
<td>Biofiltration Strip</td>
</tr>
<tr>
<td></td>
<td>Austin filter (concrete)</td>
<td>Biofiltration Swale</td>
</tr>
<tr>
<td></td>
<td>Delaware filter*</td>
<td>Detention (unlined)</td>
</tr>
<tr>
<td></td>
<td>OGFC*</td>
<td>Bioretention (all)</td>
</tr>
<tr>
<td></td>
<td>Austin filter (earthen)</td>
<td>Austin filter (concrete)</td>
</tr>
<tr>
<td></td>
<td>Detention (unlined)</td>
<td>Delaware filter</td>
</tr>
<tr>
<td></td>
<td>Infiltration basins</td>
<td>Biofiltration Strip</td>
</tr>
<tr>
<td></td>
<td>Infiltration trenches</td>
<td>Biofiltration Swale</td>
</tr>
<tr>
<td></td>
<td>Austin filter (earthen)</td>
<td>Bioretention (all)</td>
</tr>
<tr>
<td></td>
<td>Detention (unlined)</td>
<td>OGFC</td>
</tr>
</tbody>
</table>

All BMPs shown are considered effective. The PE should use professional judgment when selecting BMPs based on overall site design and feasibility.

*Delaware and OGFC filters would be ranked in Tier 2 if the TDC is nitrogen only, as opposed to phosphorous only or both nitrogen and phosphorous.

**BMP Selection Matrix D: Any metal, plus phosphorous and/or nitrogen are the TDCs**

Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility, which includes life cycle costs. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. All BMPs shown are approved and may be used.

<table>
<thead>
<tr>
<th>Infiltration ranking</th>
<th>Tier 1</th>
<th>Tier 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infiltration &lt; 20%</td>
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<td>Biofiltration Strip</td>
</tr>
<tr>
<td></td>
<td>Austin filter (concrete)</td>
<td>Biofiltration Swale</td>
</tr>
<tr>
<td></td>
<td>Delaware filter*</td>
<td>Detention (unlined)</td>
</tr>
<tr>
<td></td>
<td>OGFC*</td>
<td>Bioretention (all)</td>
</tr>
<tr>
<td></td>
<td>Austin filter (earthen)</td>
<td>Austin filter (concrete)</td>
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<td></td>
<td>Detention (unlined)</td>
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<td></td>
<td>Infiltration trenches</td>
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</tr>
<tr>
<td></td>
<td>Austin filter (earthen)</td>
<td>Bioretention (all)</td>
</tr>
<tr>
<td></td>
<td>Detention (unlined)</td>
<td>OGFC</td>
</tr>
</tbody>
</table>

All BMPs shown are considered effective. The PE should use professional judgment when selecting BMPs based on overall site design and feasibility.

*In cases where earthen BMPs also infiltrate, Delaware filters are ranked in Tier 2 if the TDC is nitrogen only, but they are Tier 1 for phosphorous only or both nitrogen and phosphorous.
5. Does the project discharge to a 303(d) receiving water that is listed for mercury or low dissolved oxygen?  
   Yes ☐  No ☑

   If Yes, contact the District/Regional NPDES Coordinator to determine if standing water in a Delaware Media Filter or Wet Basin would be a risk to downstream water quality. Continue to question 6.

   If No, continue to question 6.

6. Identify the Treatment BMPs being considered and complete the Individual Treatment BMP Summary Table and Overall Project Treatment Summary Table on the following pages. Refer to Appendix B of the PPDG and review the checklists identified below for every Treatment BMP under consideration.

   Document the basis of design in the SWDR narrative and complete Table E-2.

   DPP Infiltration Areas: Checklist T-1, Part 11
   Infiltration Devices: Checklist T-1, Part 2
   Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 3
   Detention Devices: Checklist T-1, Part 4
   Traction Sand Traps: Checklist T-1, Part 5
   Dry Weather Diversion: Checklist T-1, Part 6
   GSRDs: Checklist T-1, Part 7
   Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
   Bioretention
   Open Graded Friction Course (OGFC)

   Note:

   Multi-Chamber Treatment Train (MCTT) is not listed here because Caltrans has found that other approved BMPs are equally effective and more sustainable due to lower life cycle costs.

   Wet Basins are not listed here due to feasibility issues due to site feasibility and issues with long term operation and maintenance.

   MCTT and Wet Basins may be considered or implemented upon the recommendation of the District/Regional Design Stormwater Coordinator.

7. Prepare cost estimate, including right-of-way, and identify any pertinent site specific determination of feasibility for selected Treatment BMPs and include in the SWDR for approval.  ☑ Complete
<table>
<thead>
<tr>
<th>Individual Treatment BMP Summary Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the selected BMPs based on the findings of this checklist and the treated areas.</td>
</tr>
</tbody>
</table>

associated with each BMP in Table E-2. For projects with multiple BMPs, add rows (if needed), or attach a separate sheet displaying the following information.

Each BMP must be tracked in Table E-2. Districts may use a modified table based upon their needs. See Section 6.6 for additional information.
ATTACHMENT 12:

Checklist T-1, Part 3
### Biofiltration Swales / Biofiltration Strips

#### Feasibility

1. **Do the climate and site conditions allow vegetation to be established?**
   - Yes [✓] No [ ]
   - **If “No”, evaluate other BMPs.**

2. **Can biofiltration swale be designed with a slope between 0.25 and 6 percent (with 1 to 2 percent preferred)?**
   - Yes [✓] No [ ]
   - **If “No”, Biofiltration Swales are not feasible.**

3. **Can biofiltration strips be designed with a maximum slope of 2H:1V (with 4H:1V or flatter preferred)?**
   - Yes [✓] No [ ]
   - **If “No”, Biofiltration Strips are not feasible.**

4. **Are Biofiltration device(s) proposed at sites where known contaminated soils exist?**
   - Yes [ ] No [✓]
   - **If “Yes”, consult with District/Regional NPDES Coordinator about how to proceed.**

5. **Does adequate area exist within the RW to place Biofiltration device(s)?**
   - Yes [✓] No [ ]
   - **If “Yes”, continue to Design Elements section. If “No”, continue to Question 6.**

6. **If adequate area does not exist within RW, can suitable, additional RW be acquired to site Biofiltration devices and how much RW would be needed to treat WQF?**
   - Yes [ ] No [ ] N/A
   - [ ] acres
   - **If “Yes”, continue to Design Elements section. If “No”, continue to Question 7.**

7. **If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project.**
   - Complete [✓]
Design Elements

* Required Design Element – A “Yes” response to these questions is required to further the consideration of this BMP into the project design. Document a “No” response in Section 6 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** Recommended Design Element – A “Yes” response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? *
   - Yes
   - No

2. Can the biofiltration swale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g., freeboard, minimum slope)
   - Yes
   - No

3. Can the biofiltration swale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.4.3)*
   - Yes
   - No

4. Is the maximum length of a biofiltration strip ≤ 100 ft? Strips > 100 ft. may still be considered as long as potential erosion issues have been addressed. **
   - Yes
   - No

5. Has the minimum width (perpendicular to flow) of the invert of the biofiltration swale received the concurrence of District Maintenance? *
   - Yes
   - No

6. Can biofiltration swales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? *
   - Yes
   - No

7. Has the infiltration rate of the bio-filtration device been calculated and maximized through amendments where appropriate?**
   - Yes
   - No

8. Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train or pretreatment? **
   - Yes
   - No

   If “Yes”, document the amount of runoff treated (WQV/WQF).

9. Has the lining material been selected based on the permissible shear and velocity (refer to HDM Chapter 860 and Table 865.2)?*
   - Yes
   - No
ATTACHMENT 13:

Checklist T-1, Part 4
Treatment BMPs

Checklist T-1, Part 4

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems?  
   - Yes □ Yes □ No

2. Is basin invert ≥ 5 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.)  
   - Yes □ Yes □ No

   If No to any question above, then Detention Devices are not feasible.

3. If the Detention Device is being used to capture traction sand, is the total volume of the device at least equal to the WQV designed to be treated plus the anticipated volume of traction sand, while maintaining a minimum 12-inch freeboard (1 ft)?  
   - Yes □ Yes □ No

   If No, then Detention Devices are not feasible.

4. Does adequate area exist within the RW to place Detention Device?  
   - Yes □ Yes □ No

   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within RW, can suitable, additional RW be acquired to site Detention Device and how much RW would be needed to treat WQV? ___ acres  
   - Yes □ Yes □ No

   If Yes, continue to the Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.  
   - Complete □
**Design Elements**

* Required Design Element – A “Yes” response to these questions is required to further the consideration of this BMP into the project design. Document a “No” response in Section 6 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** Recommended Design Element – A “Yes” response is preferred for these questions, but not required for incorporation into a project design.

1. Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *

2. Can a minimum freeboard of 12 inches be provided above the overflow event elevation? *

3. Is an upstream bypass or overflow outlet provided? *

4. Is the drawdown time of the Detention Device a maximum of 96 hours? *

5. Is the basin outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *

6. Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *

7. Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Otherwise include rock or similar protective system. Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas.*

8. Has sufficient access for maintenance been provided? *

9. Is the side slope 4:1 (h:v) or flatter for interior slopes? ** (Note: Side slopes up to 3:1 (h:v) allowed with approval by District Maintenance.)

10. If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **

11. Is flow path as long as possible (> 2:1 length to width ratio at WQV elevation is recommended)? **
ATTACHMENT 14:

Checklist DPP, Parts 1-5
Consideration of Design Pollution Prevention BMPs

Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]

Will the project increase velocity or volume of downstream flow?  
- Yes ☑  - No ☐  - NA ☐

Will the project discharge to unlined channels?  
- Yes ☑  - No ☐  - NA ☐

Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?  
- Yes ☑  - No ☐  - NA ☐

If Yes was answered to any of the above questions, consider Downstream Effects Related to Potentially Increased Flow, complete the Checklist DPP-1, Part 2.

Slope/Surface Protection Systems

Will the project create new slopes or modify existing slopes?  
- Yes ☑  - No ☐  - NA ☐

If Yes was answered to the above question, consider Slope/Surface Protection Systems, complete the Checklist DPP-1, Part 3.

Concentrated Flow Conveyance Systems

Will the project create or modify ditches, dikes, berms, or swales?  
- Yes ☑  - No ☐  - NA ☐

Will project create new slopes or modify existing slopes?  
- Yes ☑  - No ☐  - NA ☐

Will it be necessary to direct or intercept surface runoff?  
- Yes ☑  - No ☐  - NA ☐

Will cross drains be modified?  
- Yes ☑  - No ☐  - NA ☐

If Yes was answered to any of the above questions, consider Concentrated Flow Conveyance Systems; complete the Checklist DPP-1, Part 4.

Preservation of Existing Vegetation, Soils, and Stream Buffer Areas

It is the goal of the Stormwater Program to maximize the protection of desirable existing vegetation, soils, and stream buffer areas to provide erosion and sediment control benefits on all projects.

Consider Preservation of Existing Vegetation, soils, and stream buffer areas, complete the Checklist DPP-1, Part 5.

☑ Complete
Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: R.E.Y Engineers, Inc. Date: August 20, 2020 District-Co-Route: 03-EA-50
PM: 16.4/16.8 Project ID/EA: 0319000152 (03-372821) RWQCB: Central Valley 5S

Downstream Effects Related to Potentially Increased Flow

1. Review total paved area and reduce to the maximum extent practicable. ✔ Complete
2. Review channel lining materials and design for stream bank erosion control. ✔ Complete
   (a) See Chapters 860 and 870 of the HDM. ✔ Complete
   (b) Consider channel erosion control measures within the construction limits as well as downstream. Consider scour velocity. If erosion control measures are required downstream of construction limits obtain the appropriate permits and right of way documents to include work within the construction limits. ✔ Complete
3. Include, where appropriate, energy dissipation devices at culvert outlets. ✔ Complete
4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour. ✔ Complete
5. Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges. ✔ Complete
6. Calculate the water quality volume infiltrated within the project limits. These calculations will be used in the Checklist T-1, Part 1. ✔ Complete
Slope / Surface Protection Systems

1. What are the proposed areas of cut and fill? (attach plan or map)  ☑ Complete

2. Were benches or terraces provided on high cut and fill slopes to shorten slope length?  ☑ Yes ☐ No

3. Were concentrated flows collected in stabilized drains or channels?  ☑ Yes ☐ No

4. Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)?
   If Yes, District Landscape Architect is responsible for an erosion control strategy and may prepare an erosion control plan.  ☑ Yes ☐ No

5. Are new or disturbed slopes > 2:1 (h:v)?
   If Yes, DES Geotechnical Design unit must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Stormwater Coordinator for slopes steeper than 2:1 (h:v).  ☐ Yes ☑ No

VEGETATED SURFACES

1. Identify existing vegetation.  ☑ Complete

2. Evaluate site to determine soil types, appropriate vegetation and planting strategies.  ☑ Complete

3. How long will it take for permanent vegetation to establish?  ☑ Complete

4. Plan transition BMPs from construction to permanent establishment.  ☑ Complete

5. Have vegetated areas and supporting permanent irrigation systems been designed to comply with the Model Water Efficient Landscape Ordinance (MWELO)?  ☑ Yes ☐ No

6. Minimize overland and concentrated flow depths and velocities.  ☑ Complete

HARD SURFACES

1. Are hard surfaces minimized?
   Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems.  ☑ Yes ☐ No
Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales
1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, 835, and Chapter 860 of the HDM. ✅ Complete
2. Review existing and proposed conditions to remove any dike not required for slope stability, erosion control, and water conveyance. ✅ Complete
3. Evaluate risks due to erosion, overtopping, flow backups or washout. ✅ Complete
4. Consider outlet protection where localized scour is anticipated. ✅ Complete
5. Examine the site for run-on from off-site sources. ✅ Complete
6. Consider permissible shear and velocity when selecting lining material (See Table 865.2 in the HDM). ✅ Complete

Overside Drains
1. Consider downdrains, as per Index 834.4 of the HDM. ✅ Complete
2. Consider paved spillways for side slopes flatter than 4:1 h:v. ✅ Complete

Flared Culvert End Sections
1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ✅ Complete

Outlet Protection/Velocity Dissipation Devices
1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ✅ Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ✅ Complete
Design Pollution Prevention BMPs
Checklist DPP-1, Part 5

Prepared by: R.E.Y Engineers, Inc. Date: August 20, 2020
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PM: 16.4/16.8 Project ID/EA: 0319000152 (03-372821) RWQCB: Central Valley 5S

Preservation of Existing Vegetation, Soils, and Stream Buffer Areas

1. Review Preservation of Property, (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation, soils, and stream buffer areas. [Complete]

2. Has all vegetation, soils, and stream buffer areas to be retained been coordinated with Environmental, and identified and defined in the contract plans? [Yes] [No]

3. Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling? [Complete]

4. Have impacts to preserved vegetation, soils, and stream buffer areas been considered while work is occurring in disturbed areas? [Yes] [No]

5. Are all areas to be preserved delineated on the plans? [Yes] [No]
ATTACHMENT 15:

Construction Site BMP Consideration Form
### Project Evaluation Process for the Consideration of Construction Site BMPs

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>Yes</th>
<th>No</th>
<th>Supplemental Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Will construction of the project result in areas of disturbed soil as defined by the Project Planning and Design Guide (PPDG)?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Soil Stabilization (SS) will be required. Review CS-1, Part 1. Continue to 2. If No, Continue to 3.</td>
</tr>
<tr>
<td>2.</td>
<td>Is there a potential for disturbed soil areas within the project to discharge to storm drain inlets, drainage ditches, areas outside the RW, etc.?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Sediment Control (SC) will be required. Review CS-1, Part 2. Continue to 3.</td>
</tr>
<tr>
<td>3.</td>
<td>Is there a potential for sediment or construction related materials and wastes to be tracked offsite and deposited on private or public paved roads by construction vehicles and equipment?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Tracking Control (TC) will be required. Review CS-1, Part 3. Continue to 4.</td>
</tr>
<tr>
<td>4.</td>
<td>Is there a potential for wind to transport soil and dust offsite during the period of construction?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Wind Erosion Control (WE) will be required. Review CS-1, Part 4. Continue to 5.</td>
</tr>
<tr>
<td>5.</td>
<td>Is dewatering anticipated or will construction activities occur within or adjacent to a live channel or stream?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Non-Stormwater Management (NS) will be required. Review CS-1, Part 5. Continue to 6.</td>
</tr>
<tr>
<td>6.</td>
<td>Will construction include saw-cutting, grinding, drilling, concrete or mortar mixing, hydro-demolition, blasting, sandblasting, painting, paving, or other activities that produce residues?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Non-Stormwater Management (NS) will be required. Review CS-1, Parts 5 &amp; 6. Continue to 7.</td>
</tr>
<tr>
<td>7.</td>
<td>Are stockpiles of soil, construction related materials, and/or wastes anticipated?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Review CS-1, Part 6. Continue to 8.</td>
</tr>
<tr>
<td>8.</td>
<td>Is there a potential for construction related materials and wastes to have direct contact with stormwater; be dispersed by wind; be dumped and/or spilt into storm drain systems?</td>
<td>✓</td>
<td></td>
<td>If Yes, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Review CS-1, Part 6.</td>
</tr>
</tbody>
</table>
ATTACHMENT 16:

Checklist CS-1, Parts 1-6
## Temporary Soil Stabilization

### General Parameters

1. How many rainy seasons are anticipated between begin and end of construction?  
   - 1

2. What is the total disturbed soil area for the project? (ac)  
   - 3.64

3. Consult your District/Regional Design Stormwater Coordinator for the minimum required combination of temporary soil stabilization and temporary sediment controls and barriers for area, slope inclinations, rainy and non-rainy season, and active and non-active disturbed soil areas.  
   - Complete

### Scheduling

4. Does the project have a duration of more than one rainy season and have disturbed soil area in excess of 25 acres?  
   - No

   (a) Include multiple mobilizations (Move-in/Move-out) as a separate contract bid line item to implement permanent erosion control or revegetation work on slopes that are substantially complete. (Estimate at least 6 mobilizations for each additional rainy season. Designated Construction Representative may suggest an alternate number of mobilizations.)  
   - Complete

   (b) Edit specifications for permanent erosion control or revegetation work to be implemented on slopes that are substantially complete.  
   - Complete

   (c) Edit permanent erosion control or revegetation specifications to require seeding and planting work to be performed when optimal.  
   - Complete

### Preservation of Existing Vegetation

5. Do Environmentally Sensitive Areas (ESAs) exist within or adjacent to the construction limits? (Verify the completion of DPP-1, Part 5)  
   - No

   (a) Verify the protection of ESAs through delineation on all project plans.  
   - Complete

   (b) Protect from clearing and grubbing and other construction disturbance by enclosing the ESA perimeter with high visibility plastic fence or other BMP.  
   - Complete
6. Are there areas of existing vegetation (mature trees, native vegetation, landscape planting, etc.) that need not be disturbed by project construction? Will areas designated for proposed or existing Treatment BMPs need protection (infiltration characteristics, vegetative cover, etc.)? (Coordinate with District Environmental and Construction to determine limits of work necessary to preserve existing vegetation to the maximum extent practicable.)

   (a) Designate as outside of limits of work (or designate as ESAs) and show on all project plans.

   (b) Protect with high visibility plastic fence or other BMP.

   ☑ Yes ☐ No

7. If yes for 5, 6, or both, then designate ESA fencing as a separate contract bid line item, if not already incorporated as part of design pollution prevention work (See DPP-1, Part 5).

   ☑ Complete

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**Slope Protection**

8. Provide a temporary soil stabilization BMP(s) appropriate for the DSA, slope steepness, slope length, and soil erodibility. (Consult with District Landscape Architect.)

   (a) Select Hydraulic Mulch, Hydoseeding, Soil Binders, Straw Mulch, Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets, Wood Mulching, other BMPs or a combination to cover the DSA throughout the project's rainy season.

   (b) Increase the quantities by 25 percent for each additional rainy season. (Designated Construction Representative may suggest an alternate increase.)

   (c) Designate as a separate contract bid line item.

   ☑ Complete

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**Slope Interrupter Devices**

9. For projects with temporary erosion control requirements, provide slope interrupter devices for all slopes with slope lengths equal to or greater than 20 ft in length, in accordance with CGP requirements.

   (a) Select Fiber Rolls or other BMPs to protect slopes throughout the project's rainy season.

   (b) For slope inclination of 4:1 (h:v) and flatter, Fiber Rolls or other BMPs shall be placed along the contour and spaced 20 ft on center.

   (c) For slope inclination between 4:1 (h:v) and 2:1 (h:v), Fiber Rolls or other BMPs shall be placed along the contour and spaced 15 ft on center.

   (d) For slope inclination of 2:1 (h:v) and greater, Fiber Rolls or other BMPs shall be placed along the contour and spaced 10 ft on center.

   ☑ Complete

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*Construction Site BMPs Checklist CS-1, Part 1*

*from Caltrans Project Planning and Design Guide - July 2017*
(e) Increase the quantities by 25 percent for each additional rainy season. (Designated Construction Representative may suggest alternate increase.)

(f) Designate as a separate contract bid line item.

**Channelized Flow**

10. Identify locations within the project site where concentrated flow from stormwater runoff can erode areas of soil disturbance. Identify locations of concentrated flow that enters the site from outside of the RW (off-site run-on).

(a) Utilize Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets, Earth Dikes/Swales, Ditches, Outlet Protection/Velcro Dissipation, Slope Drains, Check Dams, or other BMPs to convey concentrated flows in a non-erosive manner.

(b) Designate as a separate contract bid line item, as appropriate.
Construction Site BMPs
Checklist CS-1, Part 2

Prepared by: R.E.Y. Engineers, Inc. Date: August 20, 2020 District-Co-Route: 03-ED-50
PM: 16.4/16.8 Project ID/EA: 0319000152 (03-372821) RWQCB: Central Valley 5S

Sediment Control

Perimeter Controls - Run-off Control

1. Is there a potential for sediment laden sheet and concentrated flows to discharge offsite from runoff cleared and grubbed areas, below cut slopes, embankment slopes, etc.? [ ] Yes [ ] No

(a) Select linear sediment barrier such as Silt Fence, Fiber Rolls, Gravel Bag Berm, Sand Bag Barrier, Straw Bale Barrier, or a combination to protect wetlands, water courses, roads (paved and unpaved), construction activities, and adjacent properties. (Coordinate with District Construction for selection and preference of linear sediment barrier BMPs.) [ ] Complete

(b) Increase the quantities by 25 percent for each additional rainy season. (Designated Construction Representative may suggest an alternate increase.) [ ] Complete

(c) Designate as a separate contract bid line item. [ ] Complete

Perimeter Controls - Run-on Control

2. Do locations exist where sheet flow upslope of the project site and where concentrated flow upstream of the project site may contact DSA and construction activities? [ ] Yes [ ] No

(a) Utilize linear sediment barriers such as Earth Dike/Drainage Swales and Lined Ditches, Fiber Rolls, Gravel Bag Berm, Sand Bag Barrier, Straw Bale Barrier, or other BMPs to convey flows through and/or around the project site. (Coordinate with District Construction for selection and preference of perimeter control BMPs.) [ ] Complete

(b) Designate as a separate contract bid line item, as appropriate. [ ] Complete

Storm Drain Inlets

3. Do existing or proposed drainage inlets exist within the construction limits? [ ] Yes [ ] No

(a) Select Drainage Inlet Protection to protect municipal storm drain systems or receiving waters wetlands at each drainage inlet. (Coordinate with District Construction for selection and preference of inlet protection BMPs.) [ ] Complete

(b) Designate as a separate contract bid line item. [ ] Complete
4. Can existing or proposed drainage inlets utilize an excavated sediment trap as described in Drainage Inlet Protection - Type 2?
   (a) Include with other types of Drainage Inlet Protection. ✔

Sediment/Desilting Basin
5. Does the project lie within a Rainfall Area where the required combination of temporary soil stabilization and sediment control BMPs includes desilting basins?
   (a) Consider feasibility for desilting basin allowing for available right-of-way within the construction limits, topography, soil type, disturbed soil area within the watershed, and climate conditions. Document if the inclusion of sediment/desilting basins is infeasible. □
   (b) If feasible, design desilting basin(s) per the guidance in the CASQA Construction BMP Guidance Handbook to maximize capture of sediment-laden runoff. □
   (c) Designate as a separate contract bid item □

6. Is ATS to be used for controlling sediment?
   (a) If yes, then will desilting basin or other means of natural storage be used? □
   (b) If no, then plan for storage tanks sufficient to hold treatment volume. □

7. Will the project benefit from the early implementation of proposed permanent Treatment BMPs? (Coordinate with District Construction.)
   (a) Edit specifications for permanent Treatment BMP work to be implemented in a manner that will allow its use as a Construction Site BMP. □

Sediment Trap
8. Can sediment traps be located to collect channelized runoff from disturbed soil areas prior to discharge?
   (a) Design sediment traps in accordance with the CASQA Construction BMP Guidance Handbook. ✔
   (b) Designate as a separate contract bid line item. ✔
# Construction Site BMPs Checklist CS-1, Part 3


## Tracking Controls

### Stabilized Construction Entrance/Exit

1. Are there points of entrance and exit from the project site to paved roads where mud and dirt could be transported offsite by construction equipment? (Coordinate with District Construction for selection and preference of tracking control BMPs.)

   - [ ] Yes  [ ] No

   (a) Identify and designate these entrance/exit points as stabilized construction entrances.

   - [ ] Complete

   (b) Designate as a separate contract bid line item.

   - [ ] Complete

### Tire/Wheel Wash

2. Are site conditions anticipated that would require additional or modified tracking controls such as entrance/outlet tire wash? (Coordinate with District Construction.)

   - [ ] Yes  [ ] No

   (a) Designate as a separate contract bid line item.

   - [ ] Complete

### Stabilized Construction Roadway

3. Are temporary access roads necessary to access remote construction activity locations or to transport materials and equipment? (In addition to controlling dust and sediment tracking, access roads limit impact to sensitive areas by limiting ingress, and provide enhanced bearing capacity.) (Coordinate with District Construction.)

   - [ ] Yes  [ ] No

   (a) Designate these temporary access roads as stabilized construction roadways.

   - [ ] Complete

   (b) Designate as a separate contract bid line item.

   - [ ] Complete

### Street Sweeping and Vacuuming

4. Is there a potential for tracked sediment or construction related residues to be transported offsite and deposited on public or private roads? (Coordinate with District Construction for preference of including street sweeping and vacuuming with tracking control BMPs.)

   - [ ] Yes  [ ] No

   (a) Designate as a separate contract bid line item.

   - [ ] Complete
Wind Erosion Controls

Wind Erosion Control

1. Is the project located in an area where standard dust control practices in accordance with Standard Specifications, Section 14-903: Dust Control, are anticipated to be inadequate during construction to prevent the transport of dust offsite by wind? (Note: Dust control by water truck application is paid for through the various items of work. Dust palliative, if it is included, is paid for as a separate item.)

   ☐ Yes  ✔ No

   (a) Select Hydraulic Mulch, Hydroseeding, Soil Binders, Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets, Wood Mulching or a combination to cover the DSA subject to wind erosion year-round, especially when significant wind and dry conditions are anticipated during project construction. (Coordinate with District Construction for selection and preference of wind erosion control BMPs.)

      ☐ Complete

   (b) Designate as a separate contract bid line item.

      ☐ Complete
Non-Stormwater Management

Temporary Stream Crossing & Clear Water Diversion

1. Will construction activities occur within a water body or watercourse such as a lake, wetland, or stream? (Coordinate with District Construction for selection and preference for stream crossing and clear water diversion BMPs.)

(a) Select from types offered in Temporary Stream Crossing to provide access through watercourses consistent with permits and agreements. ✔

(b) Select from types offered in Clear Water Diversion to divert watercourse consistent with permits and agreements. ✔

(c) Designate as a separate contract bid line item(s). ✔

Other Non-Stormwater Management BMPs

2. Are construction activities anticipated that will generate wastes or residues with the potential to discharge pollutants?

(a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as Water Conservation Practices, Dewatering Operations, Paving and Grinding Operations, Potable Water/Irrigation, Vehicle and Equipment Cleaning, Vehicle and Equipment Fueling, Vehicle and Equipment Maintenance, Pile Driving Operations, Concrete Curing, Material and Equipment Use Over Water, Concrete Finishing, and Structure Demolition/Removal Over or Adjacent to Water. ✔

(b) Verify that costs for non-stormwater management BMPs are identified in the contract documents. Designate BMP as a separate contract bid line item if the requirements in Job Site Management Standard Specifications Section 13 are anticipated to be inadequate or if requested by Construction. ✔

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1 Coordinate with District Environmental for consistency with US Army Corps of Engineers 404 and 401 permits and Dept. of Fish and Game 1601 Streambed alteration Agreements.
### Construction Site BMPs Checklist CS-1, Part 6

**Prepared by:** R.E.Y. Engineers, Inc.  **Date:** August 20, 2020  **District-Co-Route:** 03-ED-50

**PM:** 16.4/16.8  **Project ID/EA:** 0319000152 (03-372821)  **RWQCB:** Central Valley 5S

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**Waste Management & Materials Pollution Control**

**Concrete Waste Management**

1. Does the project include concrete placement or mortar mixing?  
   - Yes  
   - No  
   - Complete ✔

   (a) Select from types offered in Concrete Waste Management to provide concrete washout facilities. In addition, consider portable concrete washouts and vendor supplied concrete waste management services. (Coordinate with District Construction for selection and preference of waste management and materials pollution control BMPs.)

   - Complete ✔

(b) Designate as a separate contract bid line item if the quantity of concrete waste and washout are anticipated to exceed 5.2 yd³ or if requested by Construction.

   - Complete ✔

**Other Waste Management and Materials Pollution Controls**

2. Are construction activities anticipated that will generate wastes or residues with the potential to discharge pollutants?  
   - Yes  
   - No  
   - Complete ✔

   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as Material Delivery and Storage, Material Use, Spill Prevention and Control, Solid Waste Management, Hazardous Waste Management, Contaminated Soil Management, Sanitary/Septic Waste Management, and Liquid Waste Management

   - Complete ✔

(b) Verify that costs for waste management and materials pollution control BMPs are identified in the contract documents. Designate BMP as a separate contract bid line item if the requirements in Job Site Management Standard Specifications Section 13 are anticipated to be inadequate or if requested by Construction.

   - Complete ✔

**Temporary Stockpiles (Soil, Materials, and Wastes)**

3. Are stockpiles of soil, etc. anticipated during construction?  
   - Yes  
   - No  
   - Complete ✔

   (a) Verify that costs for stockpile management and associated sediment control and temporary soil stabilization BMPs for temporary stockpiles are identified in the contract documents. Designate as a separate contract bid line item if the requirements in Job Site Management Standard Specifications Section 13 are anticipated to be inadequate or if requested by Construction.

   - Complete ✔