THIS REPORT IS PROVIDED AS AN EXAMPLE ONLY. ALL PROJECT INFORMATION, NAMES, AND DATES ARE FICTITIOUS. THIS IS NOT INTENDED TO BE A FINAL REPRESENTATION OF THE WORK DONE OR RECOMMENDATIONS MADE BY CALTRANS FOR AN ACTUAL PROJECT.

Long Form - Storm Water Data Report

Dist-County-Route: 07-LA-05
Post Mile Limits: 36.0 / 39.4
Project Type: HOV Lane Construction
Project ID (or EA): 07-XXXXXX
Program Identification: HB5
Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Los Angeles, Region 4

Is the Project required to consider Treatment BMPs? Yes ☒ No ☐
If yes, can Treatment BMPs be incorporated into the project? Yes ☒ No ☐
If No, a Technical Data Report must be submitted to the RWQCB at least 30 days prior to the projects RTL date. List RTL Date: _____

Total Disturbed Soil Area: 90 ac Risk Level: 2
Estimated: Construction Start Date: 05-01-2012 Construction Completion Date: 01-01-2015
Notification of Construction (NOC) Date to be submitted: 30-days prior to construction

Erosivity Waiver	Yes ☐	Date: _____	No ☒
Notification of ADL reuse (if Yes, provide date)	Yes ☒	Date: TBD	No ☐
Separate Dewatering Permit (if yes, permit number)	Yes ☐	Permit # _____	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.

Betsy Ross — 9-23-10
Betsy Ross, Registered Project Engineer — Date

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

George Washington — 9-23-10
George Washington, Project Manager — *Date*

Paul Revere — 9-23-10
Paul Revere, Designated Maintenance Representative — *Date*

Horatio Gates — 9-23-10
Horatio Gates, Designated Landscape Architect Representative — *Date*

[Stamp Required for PS&E only)

Friedrich Wilhelm von Steuben — 9-23-10
Friedrich Wilhelm von Steuben, District/Regional Design SW Coordinator or Designee — *Date*

STORM WATER DATA INFORMATION

1. Project Description

At this stage of the project Alternative 2, the no build option, was not chosen and therefore this project will move forward into design. This project is a high occupancy vehicle (HOV) lane and roadway widening project that proposes to construct one HOV lane in each direction in the median along Interstate Route 5 (I-5) from the I-5 and State Route 170 (SR-170) interchange to the I-5 and SR-118 interchange (I-5 PM 36.0/39.4). The project consists mainly of roadway widening along northbound (NB) I-5. The project also includes the removal and reconstruction of the I-5/SR-170 interchange to provide both a mixed-flow connector ramp and a direct HOV connector to and from SR-170 and I-5. As part of the roadway widening and connector reconstruction, a total of 11 on- and off-ramps will be re-aligned or widened, 6 bridge structures will be widened, and 16 retaining walls and 11 sound walls will be constructed and/or modified. Three construction stages are expected to complete the project.

The total disturbed soil area for this project is estimated to be 90 acres. The total disturbed soil area was calculated using AutoCAD and includes areas needed for the project construction activities. Within the project limits, the existing impervious surface is approximately 100 acres which will be increased to approximately 125 acres at the completion of construction (i.e., an addition of 25 acres). The proposed impervious surface was calculated by estimating all proposed pavement areas within the project limits.

The project limits are shown on the attached vicinity map. The project is located within the County of Los Angeles urban MS4 area.

2. Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

The project is located in the Los Angeles River watershed and the Bull Canyon hydraulic sub-area (HSA 412.21). The project receiving waterbody is Tujunga Wash from Hansen Dam to the Los Angeles River. The Tujunga Wash crosses within the project limits just south of the I-5/SR-170 interchange at PM 36.34. The Tujunga Wash is a 303(d) listed waterbody and is listed for coliform bacteria and trash. The Tujunga Wash also has TMDLs for ammonia and copper.

According to an Initial Study/Environmental Assessment (IS/EA) prepared in December 2004 and an Environmental Reevaluation Addendum dated January 23, 2009, a Regional Water Quality Control Board (RWQCB) 401 certification and an Army Corps of Engineers 404 permit are required for this project. Applications of the required permits are in progress.

There is one high risk area identified within the project limits according to the Caltrans Stormwater Management Program District 7 Work Plan 2010/2011 dated April 1, 2010: Pacoima Spreading Grounds (PM 39.28/40.46 on I-5). The Pacoima Spreading Grounds are located on both sides of old Pacoima Wash Channel from Arleta Avenue southwest to Woodman Avenue.

To accommodate this roadway widening project, properties and parcels will be affected and have been identified as residential, commercial, and industrial uses. These properties will need to be acquired for this project as fee takes, permanent footing easement, drainage easement, or temporary construction easement. A right-of-way certificate will be required for this project.

The project is located in the San Fernando Valley Basin, and the Los Angeles RWQCB (Region 4) has jurisdiction over these project limits. The project limits are within the Los Angeles River watershed which has three established TMDLs: Los Angeles River Trash TMDL, Los Angeles River Nitrogen Compounds and Related Effects TMDL, and Los Angeles River and Tributaries Metals TMDL.

Los Angeles River Trash TMDL

The Los Angeles River Trash TMDL became effective August 28, 2002. Caltrans is proceeding with Trash TMDL Implementation Projects, which are to retrofit GSRDs at the existing drainage outfalls in the right-of-way.

Los Angeles River Nitrogen Compounds and Related Effects TMDL

The Los Angeles River Nitrogen Compounds and Related Effects TMDL became effective March 23, 2004. The TMDL requires the Storm Water NPDES Permittees to submit a Monitoring Work Plan by March 23, 2005 to estimate nitrogen loadings associated with runoff from the storm drain systems. County of Los Angeles has submitted the Monitoring Work Plan as required on behalf of Caltrans and other Storm Water NPDES Co-Permittees in the watershed. Targeted pollutants are total ammonia as nitrogen (NH3-N), Nitrate-nitrogen (NO3-N), nitrite-nitrogen (NO2-N), and nitrate-nitrogen plus nitrite-nitrogen (NO3-N + NO2-N). The Department's monitoring data depicts Caltrans discharges to be below the TMDL limits, thus no additional measures are needed to be considered for meeting the conditions of the Nitrogen TMDL.

Los Angeles River and Tributaries Metals TMDL

The Los Angeles River and Tributaries Metals TMDL became effective on January 11, 2006. Caltrans will work with 5 groups of Responsible Agencies toward compliance of the TMDL. Targeted pollutants are total Cu, Pb, Zn, Cd, and Se.

The climate is mild with average temperatures ranging from 49 to 78 degrees Fahrenheit. The average annual rainfall in the area is 18 inches and the elevation is 600 feet above sea level. The rainy season for the project is October 1 to May 1, and the water quality rainfall intensity for Region 4 is 2 inches per hour. Topography within the project limits is relatively level. The existing soil type within the project limits is Soil Hydrologic Group B and the depth to ground water is 35 feet per the geotechnical report. The infiltration rate for the site has been determined by the Geotechnical Engineer to be 0.5 in/hr.

The project risk level has been determined in accordance with the requirements of the Construction General Permit. The risk level is based on project sediment risk and receiving water risk. For this project an overall risk level of 2 has been determined using the GIS Map Method. This method was used to calculate the risk per the Project Risk Level Determination Guidance July 2010. Since the soils in the project area have not been mapped by the United States Department of Agriculture the Web Soil Survey tool is not available for this project. The geotechnical engineer responsible for preparing the project Geotechnical Investigation

Report was contacted and they provided preliminary estimates of the needed soil information.

Aerially deposited lead (ADL) is anticipated during the construction of the project. An Aerially Deposited Lead Investigation Report dated June 29, 2005 indicates that ADL exists at depths ranging from 6 inches to 5 feet below ground surface and within 30 feet from the edge of pavement. Handling of ADL material will also be required beyond the 30 feet along the retaining wall and sound wall layout lines. The June 2005 report recommends the reuse of certain ADL contaminated soils within Caltrans right-of-way in conformance with the conditions set forth by the Department of Toxic Substances Control Variance. Potential pollutant sources include the cut and fill slopes.

All proposed Treatment BMPs are located within the existing and/or proposed Caltrans right-of-way. No right-of-way acquisition is required for Treatment BMP implementation. There are no existing Treatment BMPs within the project limits.

The construction of the project will be completed in phases to account for potential conflicts including, but not limited to, traffic handling and consideration of rainy seasons. Erosion control and BMPs will be incorporated as part of this project to reduce storm water impacts.

3. Regional Water Quality Control Board Agreements

A meeting was held by District NPDES Stormwater Coordinator, Nathanael Greene, on 9/1/10 with the Los Angeles RWQCB. There are no negotiated understandings or agreements between Caltrans and the RWQCB for this project.

The Notification of Construction (NOC) will be submitted to the Los Angeles RWQCB 30-days prior to the start of construction.

4. Proposed Design Pollution Prevention BMPs to be used on the Project.

Design Pollution Prevention BMPs will be incorporated into the project, where appropriate, in order to minimize impacts to water quality by preventing downstream erosion and stabilizing disturbed soil areas. These BMPs can also provide water quality benefits including settling of solids and other pollutants and increasing detention time by incorporating and preserving vegetated surfaces.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

The proposed improvements will increase the impervious area to accommodate the widening which will increase velocity and volume of flow within the project limits. This increase has been accounted for in the project design and mitigated through the use of BMPs. Per the project Drainage Report, the design matches the pre-project runoff curve number and time of concentration and controls erosive velocities in accordance with the HDM. Because the design has accounted for the increased velocity and volume of flow, the project should have a negligible impact on downstream flow.

This project will not discharge to unlined channels, increase the potential sediment load of downstream flow, or encroach, cross, realign, or cause other hydraulic changes that may affect downstream channel stability. Rock slope protection has been used to dissipate

energy at culvert outlets to prevent scour. All transitions between culvert outlets, headwalls, wing walls, and channels will be smooth to reduce turbulence and scour.

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

Cut and fill requirements are expected to be minimal. There will be an embankment slope for approximately 1,000 feet along SR-170. Benching and slope rounding will be specified to reduce concentrated flows on this slope. Existing slopes at the project site are 2:1 (H:V) or flatter, stable, and vegetated. New slopes will be 2:1 (H:V) or flatter.

The existing vegetated surface consists of trees and ground cover. Once substantially complete, all disturbed slopes will be revegetated in accordance with Caltrans Landscape policy and procedures. All vegetated surfaces will be identified on the project plans. Hard surfaces are not anticipated on this project.

Prior to the PS&E phase, the Erosion Prediction Procedure Manual will be used to verify that final stabilization of project surfaces is equivalent to or better than pre-project conditions.

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

New inlets and pipes will be designed to intercept runoff created by the new impervious areas and part of the existing runoff. The conveyance system will direct the runoff to new treatment BMPs. The existing system will continue to intercept and discharge the remainder of the project runoff. Scouring and gulling is not anticipated as the runoff is collected in asphalt concrete dikes. Rock slope protection will be added to existing outfalls as needed to prevent scour.

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

Clearing and grubbing is required in specific locations to facilitate construction of the new interchanges, travel lanes, retaining walls, sound walls, and treatment devices. Preservation of existing vegetation has been maximized, and the locations of clearing and grubbing have been defined on the contract plans.

All areas that will be off limits to the contractor (i.e. environmentally sensitive areas and areas of landscape preservation) have been delineated on the plans. The project design has considered minimizing the footprint of new construction, and existing grades have been matched as close as possible to preserve existing vegetation.

5. Proposed Permanent Treatment BMPs to be used on the Project

This project is required to consider Treatment BMPs per the EDF form. Treatment BMPs are feasible and there is right-a-way available on the site for BMP implementation. All BMPs will be located within the project limits.

Treatment BMP Strategy, Checklist T-1

The Tujunga Wash is 303 (d) listed for coliform bacteria and trash and has TMDLs for ammonia and copper. The Los Angeles River TMDLs include trash, nitrogen, and metals. The Targeted Design Constituents (TDCs) for the project are nitrogen and copper. The constituents and TDCs were identified using the Water Quality Planning Tool and the RWQCB Basin Plan. The proposed Treatment BMP strategy for this project will utilize bioswales, biostrips, infiltration basins, and Austin Vault sand filters to limit the amount of trash, nitrogen, and copper discharged to the Tujunga Wash. GSRDs are not being considered because infiltration devices and media filters can capture litter to meet the TMDL. All storm water will be diverted to the Treatment BMPs prior to infiltrating or discharging to Tujunga Wash.

Using the T-1 checklist approach, preliminary calculations were done to assess biofiltration. The preliminary calculations show that biofiltration alone will infiltrate less than 20% the WQV. In some cases, soil amendments are used to increase infiltration by biofiltration. Other treatment BMP options will be considered for this project, in addition to biofiltration, to treat the remaining project WQV. Using the T-1 Part 1 checklist questions 1 through 10, the project is required to use matrix D to identify feasible treatment BMPs. Each of the storm water treatment devices will be designed to treat as much of the WQV/WQF as possible from its tributary area (question 14 on Checklist T-1 Part 1). The treatment BMPs will be designed to treat 100% of the net WQV (question 15 on Checklist T-1 Part 1). A summary of the BMPs that were chosen from matrix D to treat the WQV is provided below.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

Biofiltration Swales/Strips cannot be designed to treat runoff from all project areas due to constraints by existing conditions. However, biofiltration swales/strips are feasible at on- and off-ramps and will be incorporated into the project. An approximate total area of 4 acres is anticipated to be tributary to the bioswales/strips. Preliminary locations of the bioswales/strips are shown on the project plans. All bioswales/strips will be designed to follow existing or new slopes with minimal excavation required.

Infiltration Devices – Checklist T-1, Parts 1 and 4

Infiltration Devices are feasible at on- and off-ramp loops and will be incorporated into the project. An approximate total area of 4.5 acres will be tributary to the infiltration devices. Preliminary locations of the infiltration devices are shown on the project plans. Soil within the project area has been identified as Group B, indicating a moderate infiltration rate when thoroughly wet. The infiltration rate for the site has been determined to be 0.5 in/hr. The depth of first encountered groundwater underlying the site is 35 feet. All infiltration devices will be designed with a minimum invert to groundwater separation distance of 10 feet. The geotechnical integrity of the onsite soils is not a concern for this project.

Media Filters, Checklist T-1, Parts 1 and 8

Media Filters are feasible along the project alignment and will be incorporated into the project. Preliminary locations of the filters are shown on the project plans. Due to space constraints, the design for all AVSFs will utilize concrete walls, a lined configuration. Pretreatment will be used with all filters to capture sediment and litter. An approximate total area of 22 acres will be tributary to the media filters. The depth of first encountered groundwater underlying the site is 35 feet and there are no local vector agency issues. The locations and hydraulic properties of the filters will be designed at the PS&E phase.

6. Proposed Temporary Construction Site BMPs to be used on Project

This project has a total disturbed soil area of approximately 90 acres and, therefore, requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP).

The overall site risk level has been determined to be Level 2. The project will require five monitoring locations as shown on the project plans. The project working days will be specified in the order of work specification for this project at the PS&E phase.

Projects with similar scope and range of construction activities typically require the Construction Site BMPs identified in this section. Soil stabilization and sediment control typically consist of placing linear sediment barriers (e.g., fiber rolls and temporary fence) around the excavation to provide run-on and run-off control and to prevent concentrated flow from eroding areas of soil disturbance. Storm drain inlet protection will be deployed throughout the project. Since there are three rainy seasons, multiple temporary erosion control mobilizations will be required. Compliance of the CGP can be met through the use of traditional BMPs; therefore, active treatment systems are not required.

Tracking controls, including stabilized construction entrances and street sweeping, will be required as the work will be adjacent to a roadway.

Various non-storm water management, waste management, and housekeeping BMPs shall be used throughout the duration of the project and will be included in the Construction Site Management cost item. Concrete wastes shall be managed through the use of concrete washout bins.

Because this project has a site risk level of 2, storm water monitoring is required. Monitoring will consist of storm water sampling and analysis. In addition to monitoring, this project is required to implement a rain event action plan (REAP). Quantities for sampling and testing are included in the table below; costs are included in the cost summary attached to this report.

The following BMPs will be included as separate bid line items: move-in/move-out temporary erosion control, temporary fence type ESA, temporary hydraulic mulch (bonded fiber matrix), temporary silt fence, temporary fiber rolls, temporary drainage inlet protection, plastic covers, stabilized construction entrance/exit, street sweeping, temporary concrete washout bins, preparation of a Storm Water Pollution Prevention Plan, implementation of a REAP, and storm water sampling and analysis day.

The following BMPs will be included as a lump sum under the Construction Site Management item: scheduling, stockpile management, spill prevention and control,

concrete waste management, paving and grinding operations, pavements, vehicle and equipment cleaning, vehicle and equipment cleaning fueling, vehicle and equipment maintenance, concrete curing, and concrete finishing. Dewatering will not be required during the construction of this project.

A combination of the Historical Project Method (Option 2) and Unit Cost Method (Option 3) were used to estimate costs for Construction Site BMPs. The quantities shown in the following table for the selected Construction Site BMPs were estimated using historical projects of similar size and scope.

BEES	Temporary BMPs - PPDG Appendix C	Quantity	Unit
	Scheduling	1	LS
074037	Move-In/Move-out (Temporary Erosion Control)	20	EA
071325	Temporary Fence (Type ESA)	25,000	ft
074040	Temp. Hydraulic Mulch (Bonded Fiber Matrix)	384,780	yd^2
074029	Temp. Silt Fence	25,000	ft
074028	Temporary Fiber Roll	128,550	ft^2
074038	Temp. Drainage Inlet Protection	120	EA
074034	Plastic Covers	6,000	ft^2
074033	Stabilized Constr. Entrance/Exit	16	EA
074041	Street Sweeping	1	LS
074043	Temp. Concrete Washout	7	LS
074019	Water Pollution Control (SWPPP)	1	LS
	Rain Event Action Plan (REAP)	72	EA
074058	Storm Water Sampling and Analysis Day	13	EA
CSM*	*Construction Site Management	1	LS
*CSM**	*Stockpile Management*		*LS*
*CSM**	*Spill Prevention and Control*		*LS*
*CSM**	*Concrete Waste Management*		*LS*
*CSM**	*Paving & Grinding Operations*		*LS*
*CSM**	*Vehicle and Equipment Cleaning*		*LS*
*CSM**	*Vehicle and Equipment Fueling*		*LS*
*CSM**	*Vehicle and Equipmt Maintenance*		*LS*
*CSM**	*Concrete Curing*		*LS*
*CSM**	*Concrete Finishing*		*LS*

A meeting was held on 9/1/10 to coordinate the temporary construction site BMP implementation strategy with the District Construction Stormwater Coordinator (CSWC) William Alexander. Other attendees included Betsy Ross – Project Engineer, Horatio Gates – District Landscape Architect, and Nathanael Greene– District NPDES Stormwater Coordinator. Topics discussed at the meeting included: construction site BMP selection, construction site BMP quantity estimating strategy, temporary soil stabilization BMP selection, monitoring requirements, the construction site management lump sum item, permanent erosion control strategy, mitigation planting, and plant establishment period.

Concurrence on the implementation strategy will be obtained during PS&E.

7. Maintenance BMPs (Drain Inlet Stenciling)

A meeting was held on 9/1/10 to coordinate the maintenance BMPs and concerns for this project with the District Maintenance Stormwater Coordinator (MSWC) Paul Revere. Topics discussed included protection of existing inlets, drain inlet stenciling, and the permanent erosion control strategy for the site. Drain inlet stenciling is not required for this project because there is no pedestrian access to the inlets. At this time, Mr. Revere is in agreement with the project maintenance strategy. Final concurrence on implementation of the strategy will be obtained during PS&E.

Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation
    - GIS Map Method

Supplemental Attachments

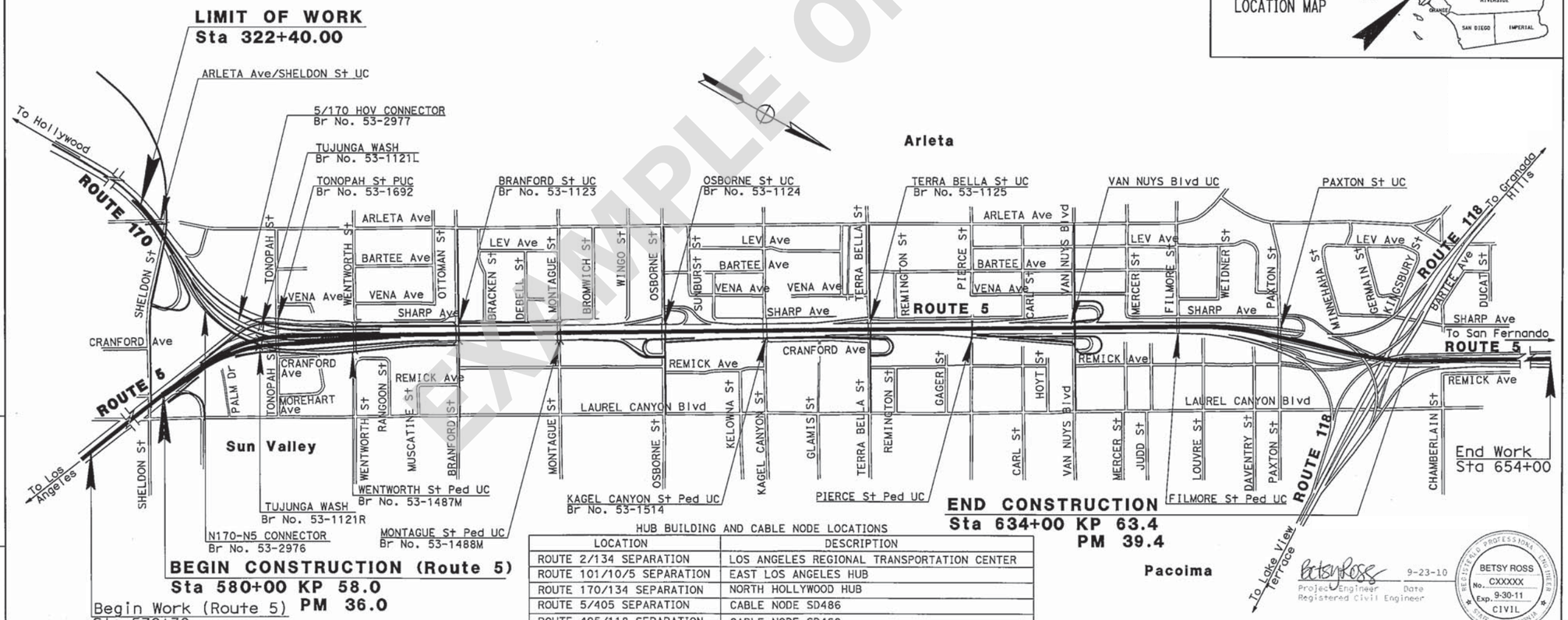
- Construction Site BMP Consideration Form
- SWDR Tracking Form
- Storm Water BMP Cost Summary
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs) [only those parts that are applicable]
- Checklist T-1, Part 1 (Treatment BMPs)
- Checklists T-1, Parts 2–8 (Treatment BMPs) [only those Parts that are applicable]

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	LA	5	58.0/63.4	1	1

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY
IN LOS ANGELES COUNTY
IN LOS ANGELES

FROM 0.10 KM NORTH OF SHELDON STREET OVER CROSSING TO ROUTE 5/118 SEPARATION



HUB BUILDING AND CABLE NODE LOCATIONS

LOCATION	DESCRIPTION
ROUTE 2/134 SEPARATION	LOS ANGELES REGIONAL TRANSPORTATION CENTER
ROUTE 101/10/5 SEPARATION	EAST LOS ANGELES HUB
ROUTE 170/134 SEPARATION	NORTH HOLLYWOOD HUB
ROUTE 5/405 SEPARATION	CABLE NODE SD486
ROUTE 405/118 SEPARATION	CABLE NODE SD468
ROUTE 405/134 SEPARATION	CABLE NODE SD398
ROUTE 5/405 SEPARATION	DATA NODE 7
ROUTE 5/405 SEPARATION	VIDEO NODE 4

THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO CONTRACTORS."

DESIGN ENGINEER: BETSY ROSS
PROJECT MANAGER: GEORGE WASHINGTON

Betsy Ross 9-23-10
Project Engineer Date
Registered Civil Engineer

REGISTERED PROFESSIONAL ENGINEER — BETSY ROSS — No. CXXXXX — Exp. 9-30-11 — CIVIL — STATE OF CALIFORNIA

Plans Approval Date

NO SCALE

CONTRACT No. 07-XXXXXX

CU XXXXX EA XXXXXX

LAST REVISION 9-23-10

BORDER LAST REVISED 9-23-10

USERNAME => s109859
DGN FILE => 712190ab01.dgn

JANIE DOE

DATE: 9-23-10

Project ID (or EA): 07-XXXXXX

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. FWS *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. *(County of Los Angeles)*, go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it a new facility or major reconstruction?	✓		If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?			If **Yes**, continue to 8. If **No**, go to 10.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. *25 ac (Net Increase New Impervious Surface)*
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*		Document for Project Files by completing this form, and attaching it to the SWDR.	

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

Risk Level - GIS Method
EA 07-XXXXXX, PA/ED 9/23/10

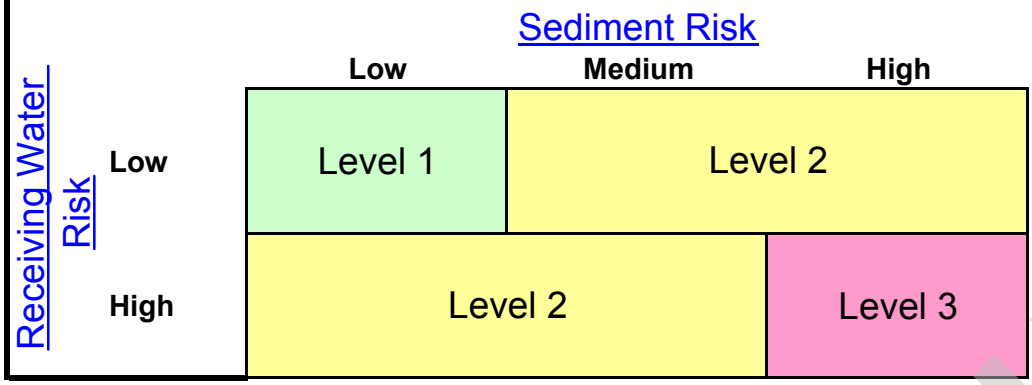
	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier 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. "Isoerodent" 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.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		110.52
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	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.		
8	Site-specific K factor guidance		
9	**K Factor Value**		1.9
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	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.		
12	LS Table		
13	**LS Factor Value**		1
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		209.988
16	**Site Sediment Risk Factor**		**High**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Risk Level - GIS Method
EA 07-XXXXXX, PA/ED 9/23/10

Receiving Water (RW) Risk Factor Worksheet	**Entry**	**Score**
A. Watershed Characteristics	**yes/no**	
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 check the attached worksheet or visit the link below: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml **OR**	**No**	**Low**
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

Risk Level - GIS Method
EA 07-XXXXXX, PA/ED 9/23/10

Combined Risk Level Matrix



Project Sediment Risk:	**High**
Project RW Risk:	**Low**
Project Combined Risk:	**Level 2**

DATE: 9-23-10

Project ID (or EA): 07-XXXXXX

Project Evaluation Process for the Consideration of Construction Site BMPs

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION
1.	Will construction of the project result in areas of disturbed soil as defined by the Project Planning and Design Guide (PPDG)?	✓		If Yes, Construction Site BMPs for Soil Stabilization (SS) will be required. Complete CS-1, Part 1. Continue to 2. If No, Continue to 3.
2.	Is there a potential for disturbed soil areas within the project to discharge to storm drain inlets, drainage ditches, areas outside the right-of-way, etc?	✓		If Yes, Construction Site BMPs for Sediment Control (SC) will be required. Complete CS-1, Part 2. Continue to 3.
3.	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?	✓		If Yes, Construction Site BMPs for Tracking Control (TC) will be required. Complete CS-1, Part 3. Continue to 4.
4.	Is there a potential for wind to transport soil and dust offsite during the period of construction?	✓		If Yes, Construction Site BMPs for Wind Erosion Control (WE) will be required. Complete CS-1, Part 4. Continue to 5.
5.	Is dewatering anticipated or will construction activities occur within or adjacent to a live channel or stream?		✓	If Yes, Construction Site BMPs for Non-Storm Water Management (NS) will be required. Complete CS-1, Part 5. Continue to 6.
6.	Will construction include saw-cutting, grinding, drilling, concrete or mortar mixing, hydro-demolition, blasting, sandblasting, painting, paving, or other activities that produce residues?	✓		If Yes, Construction Site BMPs for Non-Storm Water Management (NS) will be required. Complete CS-1, Parts 5 & 6. Continue to 7.
7.	Are stockpiles of soil, construction related materials, and/or wastes anticipated?	✓		If Yes, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Complete CS-1, Part 6. Continue to 8.
8.	Is there a potential for construction related materials and wastes to have direct contact with precipitation; stormwater run-on, or stormwater runoff; be dispersed by wind; be dumped and/or spilled into storm drain systems?	✓		If Yes, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Complete CS-1, Part 6. Continue to 9.
9.	End of checklist.	✓	Document for Project Files by completing this form, and attaching it to the SWDR.	

PE to initialize after concurrence with Construction (PS&E only) *Date*

SWDR Tracking Form

Rpt_to_hq	Dist_EA	District	EA	County	Route	Beg_PM	End_PM	Descrip	Phase	LongSWDR	PhaseRptDate	Exempt	TBMP	Pollution_Program	Disturbance Acr	AddImpArea	PercentTreated	MS4Area	MS4CiCo	ter Bodies Affec	Criteria	BioStrip	BioSwale	Detention	Infiltration	InfilTrench	GSRD	TST	DryWeath	MedFilter	MCTT	WetBasin	Const_Start	Const_Comp	SWComment
23-Sep-10	07-XXXXXX	7	XXXXXX	LA	5	36	39.4	HOV Lane Construction	PA/ED	TRUE	23-Sep-10	TRUE	TRUE	SWPPP	90	25	100	TRUE	County of LA	Tujunga Wash	303, TMDL	0	0	0	0	0	0	0	0	0	0	0	01-May-12	01-Jan-15	

SWDR Tracking Form

IDNO	STBMPCode	PE	District	County	Route	LocBPM	LocEPM	Location	Direction	Facility	Cubic Yards	Const_Comp	Comments

Storm Water BMP Cost Summary PA/ED
THIS INFORMATION IS FOR **CALTRANS INTERNAL USE ONLY**

Project Name:	**HOV Lane Construction I-5**
District:	**7**
County:	**LA**
Route:	**5**
Postmile Limits:	**36.0 / 39.4**
Project ID (or EA):	**07-XXXXXX**

Total Treatment BMP Costs	$ 2,260,000
Total Design Pollution Prevention BMP Costs	$ 588,400
Total Permanent Storm Water BMP Costs	$ 2,848,400
Subtotal Soil Stabilization BMPs	$ 880,865
Subtotal Sediment Control BMPs	$ 739,975
Subtotal Wind Erosion Control BMPs	$ 18,000
Subtotal Tracking Control BMPs	$ 66,000
Subtotal Waste Management & Materials Handling BMPs	$ 10,500
Subtotal Non-Storm Water Management	$ 2,250,000
Subtotal Miscellaneous Items	$ 68,035
Total Construction Site BMP Costs	$ 4,033,375
TOTAL COST FOR STORM WATER BMPs	$ 6,881,775

Note: Please enter data in the fields shaded on this and the following pages. The totals will be reflected on this sheet automatically.

Storm Water BMP Cost Summary PA/ED
THIS INFORMATION IS FOR **CALTRANS INTERNAL USE ONLY**

Treatment BMPs

BEES	Pollution Prevention BMPs PPDG Appendix A	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost ($)
	Biofiltration Strip			1	EA	1,000	$ 1,000
	Biofiltration Swale			3	EA	3,000	$ 9,000
034731	Austin Vault Sand Filter			5	LS	450,000	$ 2,250,000
						Total Treatment BMP Costs	$ 2,260,000

Design Pollution Prevention BMPs

BEES	Pollution Prevention BMPs PPDG Appendix A	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost ($)
	Downstream Effects/Increased Flow Mitigation						
705307	- 12" Alternative Flared End Section	No	Yes	2	EA	250	$ 500
	Slope/Surface Protection Systems- Hard Surfaces						
729010	- Rock Slope Protection Fabric	72-150	No	1,200	SQYD	2	$ 2,400
	- Rock Slope Protection			1,140	CY	75	$ 85,500
	Slope/Surface Protection Systems- Vegetated Surfaces						
204099	Plant Establishment Work	20-550		1	LS	500,000	$ 500,000
						Total Design Pollution Prevention BMP Costs	$ 588,400

Total Permanent Storm Water BMP Costs	**$ 2,848,400**

Storm Water BMP Cost Summary PA/ED

THIS INFORMATION IS FOR **CALTRANS INTERNAL USE ONLY**

Temporary Construction Site BMPs

BEES	Temporary BMPs - PPDG Appendix C	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost ($)
	Temporary Soil Stabilization						
074037	Move-In/Move-out (Temporary Erosion Control)	07-485	No	20	EA	1,000	$ 20,000
	Scheduling		No	1	LS	50,000	$ 50,000
071325	Temporary Fence (Type ESA)	07-446	Yes	25,000	ft	6	$ 137,500
074040	Temp. Hydraulic Mulch (Bonded Fiber Matrix)	07-381	No	384,780	yd^2	2	$ 673,365
						Subtotal Soil Stabilization BMPs	**$ 880,865**

BEES	*Temporary Sediment Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
074029	Temp. Silt Fence	07-430	Yes	25,000	ft	6	$ 137,500
074028	Temporary Fiber Roll	07-420	Yes	128,550	ft^2	5	$ 578,475
074038	Temp. Drainage Inlet Protection	07-490	Yes	120	EA	200	$ 24,000
						Subtotal Sediment Control BMPs	**$ 739,975**

BEES	*Temporary Wind Erosion Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
074034	Plastic Covers	07-395	Yes	6,000	ft^2	3	$ 18,000
						Subtotal Wind Erosion Control BMPs	**$ 18,000**

BEES	*Temporary Tracking Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
074033	Stabilized Constr. Entrance/Exit	07-480	Yes	16	EA	3,000	$ 48,000
074041	Street Sweeping	07-360	No	1	LS	18,000	$ 18,000
						Subtotal Tracking Control BMPs	**$ 66,000**

BEES	*Temporary Waste Management Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
CSM*	Stockpile Management	07-346	No		LS		$ -
CSM*	Spill Prevention and Control	07-346	No		LS		$ -
CSM*	Concrete Waste Management	07-346	No		LS		$ -
074043	Temp. Concrete Washout Bin	07-407	No	7	EA	1,500	$ 10,500
						Subtotal Waste Management & Materials Handling BMPs	$ 10,500

BEES	*Temporary Non-Storm Water Management*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
CSM*	Paving & Grinding Operations				LS		$ -
CSM*	Vehicle and Equipment Cleaning	07-346	No		LS		$ -
CSM*	Vehicle and Equipment Fueling	07-346	No		LS		$ -
CSM*	Vehicle and Equipmt Maintenance	07-346	No		LS		$ -
CSM*	Concrete Curing	07-346	No		LS		$ -
CSM*	Concrete Finishing	07-346	No		LS		$ -
CSM*	***Construction Site Management**	07-346	No	1	LS	2,250,000	$ 2,250,000
						Subtotal Non-Storm Water Management	$ 2,250,000

BEES	*Miscellaneous Items*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
074019	Water Pollution Control (SWPPP)	07-345	No	1	LS	16,500	$ 16,500
	Rain Event Action Plan (REAP)		No	72	EA	500	$ 36,000
074058	Storm Water Sampling and Analysis Day		No	13	EA	1,195	$ 15,535
						Subtotal Miscellaneous Items	**$ 68,035**

Total Construction Site BMP Costs	**$ 4,033,375**

07-XXXXXX
Storm Water Costs
PA/ED
B. Ross 9-23-10
1/2

Construction Site BMPs - Miscellaneous Items

- Prepare a SWPPP: > 12,000,000 = $6,000 + RQM
  (Table F-6, PPDG 2010 pg F-11)

RQM = ((mths/3) + 1) × (N + 4) × Labor — EQN 1, PPDG 2010 pg F-11

where:
mths (project duration) : 32
N : 5
Labor : $100

RQM = $10,500

Prepare a SWPPP = $16,500

- Rain Event Actin PLAN (REAP):

Project risk level: 2 — REAP = $500 × Days 0.1" — pg. F-12 PPDG 2010

Annual Mean Number of Daily Precipitation ≥0.1 = 24.3
└Project Rainfall: Burbank Valley (see print out attached)
REAP = 24 × $500 × 3 rainy seasons = $36,000

- Storm Water Sampling & Analysis Day:

SW Sampling & Analysis Day = SWM Cost / Days 0.5" — eqn 3 PPDG 2010 pg F-13

SWM costs = M × {[Days 0.5" × $1,000] + $2000 (1 + 0.1 (Mths/12))}

where:
M : 1
Mths : 32
Days 0.5" : 13

Annual Mean #s of Daily Precipitation (def. PPDG 2010 pg F-13)
≥0.1 = 24.3 ≥0.5 = 11.1
Days 0.5" = 24.3 − 11.1 = 13.2

07-XXXXXX
Storm Water Costs
PA/ED
B. Ross 9-23-10
2/2

Storm Water Sampling + Analysis Day (cont)

SWM Costs = $ 15,533

SW Sampling + Analysis Day = $15,533/13 = $1,195

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Climatography of the United States No. 20 1971-2000

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

#11

Station: BURBANK VALLEY PUMP PLNT, CA

COOP ID: 041194

Climate Division: CA 6 **NWS Call Sign:** **Elevation: 655 Feet** **Lat: 34°11N** **Lon: 118°20W**

Precipitation (inches)

Precipitation Totals

Month	Means/Medians(1) Mean	Means/Medians(1) Median	Extremes Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	3.56	2.49	7.76	1943	22	15.92	1995	.00+	1984
Feb	4.29	2.58	4.50	1993	8	15.52	1998	.00	1984
Mar	3.88	2.86	5.45	1983	1	12.87	1978	.00+	1997
Apr	1.02	.58	2.30+	2000	18	5.47	1983	.00+	1997
May	.37	.06	2.29	1977	8	4.37	1998	.00+	2000
Jun	.12	.00	1.01	1993	5	1.04	1993	.00+	2000
Jul	.02	.00	.18	1992	12	.21	1986	.00+	2000
Aug	.18	.00	2.86	1977	17	2.97	1977	.00+	1999
Sep	.30	.01	1.43	1976	10	3.39	1976	.00+	1999
Oct	.55	.20	1.63	1983	1	4.26	1987	.00+	1999
Nov	1.05	.78	5.28	1970	29	3.54	1982	.00+	2000
Dec	2.15	1.24	5.30	1965	29	6.72	1971	.00+	2000
Ann	17.49	15.96	7.76	Jan 1943	22	15.92	Jan 1995	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.6	5.0	2.3	1.3
Feb	6.3	4.8	2.6	1.4
Mar	6.7	4.5	2.5	1.2
Apr	3.2	2.1	.6	.3
May	1.6	.6	.2	.1
Jun	.6	.2	.1	@
Jul	.3	.1	.0	.0
Aug	.6	.3	.1	@
Sep	1.2	.6	.2	.1
Oct	2.2	1.2	.3	.2
Nov	2.8	1.8	.8	.2
Dec	4.3	3.1	1.4	.7
Ann	36.4	24.3	11.1	5.5

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels

These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.00	.00	.39	.89	1.48	2.21	3.11	4.29	5.96	8.86	11.79
Feb	.03	.17	.58	1.11	1.77	2.59	3.64	5.05	7.08	10.65	14.29
Mar	.00	.15	.64	1.19	1.83	2.59	3.52	4.71	6.40	9.29	12.18
Apr	.00	.00	.00	.14	.32	.55	.84	1.22	1.76	2.71	3.67
May	.00	.00	.00	.00	.00	.04	.12	.28	.57	1.05	1.71
Jun	.00	.00	.00	.00	.00	.00	.00	.01	.12	.39	.71
Jul	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06	.13
Aug	.00	.00	.00	.00	.00	.00	.00	.00	.10	.55	1.12
Sep	.00	.00	.00	.00	.00	.00	.04	.18	.44	1.00	1.62
Oct	.00	.00	.00	.04	.12	.23	.39	.61	.94	1.55	2.18
Nov	.00	.00	.06	.24	.44	.67	.95	1.30	1.79	2.60	3.45
Dec	.00	.00	.24	.54	.90	1.34	1.89	2.60	3.61	5.36	7.13
Ann	5.05	6.71	9.21	11.38	13.50	15.71	18.15	21.02	24.74	30.58	36.00

Also occurred on an earlier date(s)
Denotes amounts of a trace
Denotes mean number of days greater than 0 but less than .05
Statistics not computed because less than six years out of thirty had measurable precipitation

(24.3 - 11.1) = 13.2

use 13

(1) From the 1971-2000 Monthly Normals
(2) Derived from station's available digital record: 1939-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Checklist SW-1, Site Data Sources

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect 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 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• Photogrammetric Data and USGS Quad Maps	August 2010
• Survey Data, Topographic Maps, and Aerial Photographs	March 2006, August 2010
Hydraulic	
• Initial Study/Environmental Assessment, Environmental Reevaluation Addendum	December 2004, January 2009
• http://www.water-programs.com/wqpt.htm	August 2010
•	
Soils	
• Initial Site Assessment	March 2005
• Geotechnical Investigation Report	December 2006
• NRCS Maps (Soil Group Index Maps)	August 2010
• Aerially Deposited Lead Investigation Report	June 2005
Climatic	
• http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7759	August 2010
Water Quality	
• http://www.water-programs.com/wqpt.htm	August 2010
• http://www.swrcb.ca.gov/rwqcb4/	August 2010
• Caltrans SWPPP/WPCP Preparation Manual	March 2007
Other Data Categories	
• Caltrans Stormwater Management Program District 7 Work Plan 2010/2011	April 2010
• Caltrans Storm Water Quality Handbooks, Project Planning and Design Guide (PPDG)	July 2010
•	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1.	Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation). **Tujunga Wash**	☒Complete	☐NA
2.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern. **Tujunga Wash: coliform bacteria and trash**	☒Complete	☐NA
3.	Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas. **Pacoima Spreading Grounds (PM 39.28/40.46 on I-5)**	☒Complete	☐NA
4.	Determine the RWQCB special requirements, including TMDLs, effluent limits, etc. **Tujunga Wash: Ammonia and copper. Prescriptive TMDLs: trash, nutrients, and metals**	☒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. **Yes, 401 and 404 are required**	☒Complete	☐NA
7.	List rainy season dates. **Rainy season Oct 1 to May 1**	☒Complete	☐NA
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves. **Mild, annual rainfall 18"**	☒Complete	☐NA
9.	If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater. **Soil Type B, groundwater depth 35'**	☒Complete	☐NA
10.	Determine contaminated soils within the project area.	☒Complete	☐NA
11.	Determine the total disturbed soil area of the project. **90 ac**	☒Complete	☐NA
12.	Describe the topography of the project site. **Relatively level**	☒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, etc.). **None**	☒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? **None**	☒Complete	☐NA
15.	Determine if a right-of-way certification is required.	☒Complete	☐NA
16.	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. **None**	☒Complete	☐NA
17.	Determine if project area has any slope stabilization concerns. **none**	☒Complete	☐NA
18.	Describe the local land use within the project area and adjacent areas. **Completed developed residential and commercial**	☒Complete	☐NA

19. Evaluate the presence of dry weather flow. **None** ☒Complete ☐NA

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

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

The PE must 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.

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?	☐Yes	☒No	☐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 storm water 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 storm water impacts?	☐Yes	☒No	☐NA

Design Pollution Prevention BMPs

Checklist DPP-1, Part 1

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Consideration of Design Pollution Prevention BMPs

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

Will project increase velocity or volume of downstream flow?	☒ Yes	☐ No	☐ NA
Will the project discharge to unlined channels?	☐ Yes	☒ No	☐ NA
Will project increase potential sediment load of downstream flow?	☐ Yes	☒ No	☐ NA
Will 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 DPP-1, Part 2 checklist.

Slope/Surface Protection Systems

Will 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 DPP-1, Part 3 checklist.

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 DPP-1, Part 4 checklist.

Preservation of Existing Vegetation

It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒ Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs

Checklist DPP-1, Part 2

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

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 project limits as well as downstream. Consider scour velocity. ☒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

Design Pollution Prevention BMPs

Checklist DPP-1, Part 3

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

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 reduce concentration of flows?	☒Yes ☐No
3.	Were slopes rounded and/or shaped to reduce concentrated flow?	☒Yes ☐No
4.	Were concentrated flows collected in stabilized drains or channels?	☒Yes ☐No
5.	Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)? If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.	☒Yes ☐No
6.	Are new or disturbed slopes > 2:1 (h:v)? If Yes, Geotechnical Services 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 Storm Water Coordinator for slopes steeper than 2:1 (h:v).	☐Yes ☒No
7.	Estimate the net new impervious area that will result from this project. 24.5acres	☒Complete

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.	Minimize overland and concentrated flow depths and velocities.	☒Complete

HARD SURFACES

1.	Are hard surfaces required? If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations.	☐Yes ☒No ☐Complete

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. ☐Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 4

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, and 835, and Chapter 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒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: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Preservation of Existing Vegetation

1. Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation. ☒Complete

2. Has all vegetation 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 been considered while work is occurring in disturbed areas? ☒Yes ☐No

5. Are all areas to be preserved delineated on the plans? ☒Yes ☐No

Treatment BMPs

Checklist T-1, Part 1

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

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 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watershed 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, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed. Questions 14 through 16 should be answered after all subwatershed (drainages) are considered using this checklist.

1. Is the project in a watershed with prescriptive TMDL treatment BMP requirements in an adopted TMDL implementation plan? ☒Yes ☐No

   If Yes, consult the District/Regional Storm Water Coordinator to determine whether the T-1 checklist should be used to propose alternative BMPs because the prescribed BMPs may not be feasible or other BMPs may be more cost-effective. Special documentation and regulatory response may be necessary.

2. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No

   (b) Is a sanitary sewer located on or near the site? ☐Yes ☒No

   If Yes to both 2 (a) and (b), continue to (c). If No to either, skip to question 3.

   (c) Is connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☐Yes ☐No

   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☐No

   If Yes was answered to all of these questions consider ***Dry Weather Flow Diversion***, complete and attach **Part 3** of this checklist

3. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☒Yes ☐No

If Yes, consider ***Gross Solids Removal Devices (GSRDs)***, complete and attach **Part 6** of this checklist. Note: Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter. Before considering GSRDs for stand-alone installation or in sequence with other BMPs, consult with District/Regional NPDES Storm Water Coordinator to determine whether Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins should be considered instead of GSRDs to meet litter/trash TMDL.

4. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year? ☐Yes ☒No

   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist.

5. Maximizing Biofiltration Strips and Swales

   Objectives:

   1) Quantify infiltration from biofiltration alone
   2) Identify highly infiltrating biofiltration (i.e. > 90%) and skip further BMP consideration.
   3) Identify whether amendments can substantially improve infiltration.

   (a) Have biofiltration strips and swales been designed for runoff from all project areas, including sheet flow and concentrated flow conveyance? If no, document justification in Section 5 of the SWDR. ☐Yes ☒No

   (b) Based on site conditions, estimate what percentage of the WQV[1] can be infiltrated. When calculating the WQV, use a 12-hour drawdown for Type A and B soils, a 24-hour drawdown for Type C soils, and a 48-hour drawdown for Type D soils.

   _X_ < 20%
   ___ 20 % - 50%
   ___ 50% - 90%
   ___ > 90%

   ☒Complete

   (c) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐Yes ☒No

[1] A complete methodology for determining WQV infiltration is available at: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm

(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments? Use the 'drain time' associated with the amended soil (the 12-hour WQV for Type A and B soils, the 24-hour WQV for Type C soils[2]). ☒Yes ☐No

If Yes, consider including soil amendments; increasing the infiltration ranking allows more flexibility in the selection of BMPs (strips and swales will show performance comparable to other BMPs). Record the new infiltration estimate below:

_X_ < 20% (skip to 6)
___ 20 % - 50% (skip to 6)
___ 50% - 90% (skip to 6)
___ >90%

☒Complete

(e) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐Yes ☐No

6. Biofiltration in Rural Areas

Is the project in a rural area (outside of urban areas that is covered under an NDPES Municipal Stormwater Permit[3]). If Yes proceed to question 13. ☐Yes ☒No

7. Estimating Infiltration for BMP Combinations

Objectives:

1) Identify high-infiltration biofiltration or biofiltration and infiltration BMP combinations and skip further BMP consideration.

2) If high infiltration is infeasible, then identify the infiltration level of all feasible BMP combinations for use in the subsequent BMP selection matrices

(a) Has concentrated infiltration (i.e., via earthen basins or earthen filters) been prohibited? Consult your District/Regional Storm Water Coordinator and/or environmental documents. ☐Yes ☒No

If No proceed to 7 (b); if Yes skip to question 8 and do not consider earthen basin-type BMPs

[2] Type D soils are not expected where amendments are incorporated

[3] See pages 39 and 40 of the Fact Sheets for the CGP.
http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf

(b) Assess infiltration of an infiltration BMP that is used in conjunction with biofiltration. Include infiltration losses from biofiltration, if biofiltration is feasible. ☒Complete

(use 24 hr WQV)
_X_ < 20% (do not consider this BMP combination)
___ 20% - 50%
___ 50% - 90%
___ >90%

Is at least 90 percent infiltration estimated? If Yes proceed to 13. If No proceed to 7(c). ☐Yes ☐No

(c) Assess infiltration of biofiltration with combinations with remaining approved earthen BMPs using water quality volumes based on the drain time of those BMPs. This assessment will be used in subsequent BMP selection matrices.

Earthen Detention Basin (use 48 hr WQV)	Earthen Austin SF (use 48 hr WQV)
___ < 20%	___ < 20%
___ 20% - 50%	___ 20% - 50%
___ > 50%	___ > 50%

☐Complete

Continue to Question 8

8. Identifying BMPs based on the Target Design Constituents

(a) Does the project discharge to a water body that has been placed on the 303-d list or has had a TMDL adopted? If "No," use Matrix A to select BMPs, consider designing to treat 100% of the WQV, then skip to question 12. ☒Yes ☐No

If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply below)?

☐ sediments	☒ copper (dissolved or total)
☐ phosphorus	☐ lead (dissolved or total)
☒ nitrogen	☐ zinc (dissolved or total)
	☐ general metals (dissolved or total)[1]

(b) Treating Sediment. Is sediment a TDC? If Yes, use Matrix A to select BMPs, then skip to question 12. Otherwise, proceed to question 9. ☐Yes ☒No

[1] General metals include cadmium, nickel, chromium, and other trace metals. Note that selenium and arsenic are not metals. Mercury is a metal, but is considered later during BMP selection, under Question 12 below.

BMP Selection Matrix A: General Purpose Pollutant Removal			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for 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 (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Strip: HRT > 5 Austin filter (concrete) Austin filter (earthen) Delaware filter MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Swale MCTT Wet basin	Austin filter (concrete) Delaware filter MCTT Wet basin
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

9. Treating both Metals and Nutrients.
   Is copper, lead, zinc, or general metals *AND* nitrogen or phosphorous a TDC? If Yes use Matrix D to select BMPs, then skip to question 12. Otherwise, proceed to question 10. ☒Yes ☐No

10. Treating Only Metals.
    Are copper, lead, zinc, or general metals listed TDCs? If Yes use Matrix B below to select BMPs, and skip to question 12. Otherwise, proceed to question 11. ☐Yes ☐No

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for 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 (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	MCTT Wet basin Austin filter (earthen) Austin filter (concrete) Delaware filter	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Biofiltration Strip Biofiltration Swale Wet basin
Tier 2	Strip: HRT > 5 Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

11. Treating Only Nutrients.
Are nitrogen and/or phosphorus listed TDCs? If "Yes," use Matrix C to select BMPs. If "No", please check your answer to 8(a). At this point one of the matrices should have been used for BMP selection for the TDC in question, unless no BMPs are feasible. ☐Yes ☐No

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for 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 (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Austin filter (earthen) Austin filter (concrete) Delaware filter**	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches*	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Wet basin Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale Wet basin	Austin filter (concrete) Delaware filter Wet basin
* Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			
** Delaware 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 approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for 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 (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Wet basin* Austin filter (earthen) Austin filter (concrete) Delaware filter**	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches***	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches*** Biofiltration Strip Biofiltration Swale
Tier 2	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
* The wet basin should only be considered for phosphorus			
** In cases where earthen BMPs can 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.			
*** Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

12. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for mercury or low dissolved oxygen? ☐Yes ☒No

    If Yes contact the District/Regional NPDES Storm Water Coordinator to determine if standing water in a Delaware filter, wet basin, or MCTT would be a risk to downstream water quality.

13. After completing the above, identify and attach the checklists shown below for every Treatment BMP under consideration. (use one checklist every time the BMP is considered for a different drainage within the project) ☒Complete

    _✓_ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
    ___ Dry Weather Diversion: Checklist T-1, Part 3
    _✓_ Infiltration Devices: Checklist T-1, Part 4
    ___ Detention Devices: Checklist T-1, Part 5
    ___ GSRDs: Checklist T-1, Part 6
    ___ Traction Sand Traps: Checklist T-1, Part 7
    _✓_ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
    ___ Multi-Chambered Treatment Train: Checklist T-1, Part 9
    ___ Wet Basins: Checklist T-1, Part 10

14. Estimate what percentage of WQV (or WQF, depending upon the Treatment BMP selected) will be treated by the preferred Treatment BMP(s): ☐Complete

    (a) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☒Yes ☐No

15. Estimate what percentage of the net WQV (for all new impervious surfaces within the project) that will be treated by the preferred treatment BMP(s): ☐Complete

16. Prepare cost estimate, including right-of-way, and site specific determination of feasibility (Section 2.4.2.1) for selected Treatment BMPs and include as supplemental information for SWDR approval. ☐Complete

Treatment BMPs
Checklist T-1, Part 2

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Biofiltration Swales / Biofiltration Strips Swale #36

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No
2. Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? ☒Yes ☐No

   If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

   3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? ☐Yes ☒No
   If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? ☒Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 5.
5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres **NA** ☐Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 6.
6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. **NA** ☐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 5 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, etc.)	☒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.2.3.1)*	☒Yes	☐No
4.	Is the maximum length of a biofiltration strip ≤ 300 ft? *	☒Yes	☐No
5.	Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of 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.	Is the biofiltration strip sized as long as possible in the direction of flow? **	☒Yes	☐No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? **	☒Yes	☐No

Biofiltration Swales / Biofiltration Strips Strip #37

Feasibility

1.	Do the climate and site conditions allow vegetation to be established?	☒Yes	☐No
2.	Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.	☒Yes	☐No
3.	Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.	☐Yes	☒No
4.	Does adequate area exist within the right-of-way to place Biofiltration device(s)? If "Yes", continue to Design Elements section. If "No", continue to Question 5.	☒Yes	☐No
5.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres **NA** If "Yes", continue to Design Elements section. If "No", continue to Question 6.	☐Yes	☐No

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. **NA** ☐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 5 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, etc.)	☒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.2.3.1)*	☒Yes	☐No
4.	Is the maximum length of a biofiltration strip ≤ 300 ft? *	☒Yes	☐No
5.	Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of 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.	Is the biofiltration strip sized as long as possible in the direction of flow? **	☒Yes	☐No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? **	☒Yes	☐No

Biofiltration Swales / Biofiltration Strips Swale #38

Feasibility

1.	Do the climate and site conditions allow vegetation to be established?	☒Yes	☐No
2.	Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)?	☒Yes	☐No

If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? ☐Yes ☒No
If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? ☒Yes ☐No
If "Yes", continue to Design Elements section. If "No", continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres **NA** ☐Yes ☐No
If "Yes", continue to Design Elements section. If "No", continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. **NA** ☐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 5 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, etc.) ☒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.2.3.1)* ☒Yes ☐No

4. Is the maximum length of a biofiltration strip ≤ 300 ft? * ☒Yes ☐No

5. Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of 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. Is the biofiltration strip sized as long as possible in the direction of flow? ** ☒Yes ☐No

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

Biofiltration Swales / Biofiltration Strips Swale #44

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No

2. Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? ☒Yes ☐No

   If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? ☐Yes ☒No
   If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? ☒Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres **NA** ☐Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. **NA** ☐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 5 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, etc.) ☒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.2.3.1)* ☒Yes ☐No

4. Is the maximum length of a biofiltration strip ≤ 300 ft? * ☒Yes ☐No

5.	Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of 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.	Is the biofiltration strip sized as long as possible in the direction of flow? **	☒Yes	☐No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? **	☒Yes	☐No

Treatment BMPs

Checklist T-1, Part 4

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Infiltration Devices – Infiltration Basin #36

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
3.	Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?	☐Yes	☒No
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☐Yes	☒No
5.	Is site located over a previously identified contaminated groundwater plume?	☐Yes	☒No

If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.

6.	(a) Does site have groundwater within 10 ft of basin invert?	☐Yes	☒No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr? **0.5 in/hr**	☐Yes	☒No

If "Yes" to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.

7.	Does adequate area exist within the right-of-way to place Infiltration Device(s)? If "Yes", continue to Design Elements sections. If "No", continue to Question 8.	☒Yes	☐No
8.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of-way would be needed to treat WQV? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 9.	☐Yes	☐No
9.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements – Infiltration Basin

* **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 5 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 a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☒ Yes	☐ No
2.	Has an overflow spillway with scour protection been provided? *	☒ Yes	☐ No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) *	☐ Yes	☒ No
4.	Can access be placed to the invert of the Infiltration Basin? *	☒ Yes	☐ No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.3.1)? *	☒ Yes	☐ No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	☒ Yes	☐ No
7.	Can vegetation be established in the Infiltration Basin? **	☒ Yes	☐ No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☒ Yes	☐ No
9.	Can a gravity-fed Maintenance Drain be placed? **	☒ Yes	☐ No

Infiltration Devices Infiltration Basin #41

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
3.	Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?	☐Yes	☒No
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☐Yes	☒No
5.	Is site located over a previously identified contaminated groundwater plume?	☐Yes	☒No
	If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.		
6.	(a) Does site have groundwater within 10 ft of basin invert?	☐Yes	☒No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr? **0.5 in/hr**	☐Yes	☒No
	If "Yes" to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.		
7.	Does adequate area exist within the right-of-way to place Infiltration Device(s)? If "Yes", continue to Design Elements sections. If "No", continue to Question 8.	☒Yes	☐No
8.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of-way would be needed to treat WQV? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 9.	☐Yes	☐No
9.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements – Infiltration Basin

* **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 5 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 a detailed investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☒Yes	☐No
2.	Has an overflow spillway with scour protection been provided? *	☒Yes	☐No
3.	Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) *	☐Yes	☒No
4.	Can access be placed to the invert of the Infiltration Basin? *	☒Yes	☐No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.3.1)? *	☒Yes	☐No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	☒Yes	☐No
7.	Can vegetation be established in the Infiltration Basin? **	☒Yes	☐No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☒Yes	☐No
9.	Can a gravity-fed Maintenance Drain be placed? **	☒Yes	☐No

Treatment BMPs

Checklist T-1, Part 8

Prepared by: B. Ross Date: 09/23/10 District-Co-Route: 07-LA-05

PM : 36.0 / 39.4 Project ID (or EA): 07-XXXXXX RWQCB: Los Angeles (4)

Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault. See Appendix B, Media Filters, for a further description of Media Filters.

AVSF #37

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No
2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No
3. If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater? ☒Yes ☐No
4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.
5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☒Yes ☐No

   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No

   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Design Elements – Austin Sand Filter

* **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 5 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.	Is the drawdown time of the 2nd chamber 24 hours? *	☒Yes	☐No
2.	Is access for Maintenance vehicles provided to the Austin Sand Filter? *	☒Yes	☐No
3.	Is a bypass/overflow provided for storms > WQV? *	☒Yes	☐No
4.	Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? **	☒Yes	☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☒Yes	☐No
6.	Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 9.	☐Yes	☒No
7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? * If No, design with an impermeable liner.	☒Yes	☐No
8.	Are side slopes of the earthen chamber 3:1 (h:v) or flatter? *NA	☐Yes	☐No
9.	Is maximum depth ≤ 13 ft below ground surface? *	☒Yes	☐No
10.	Can the Austin Sand Filter be placed in an offline configuration? **	☐Yes	☒No

AVSF #42

Feasibility – Austin Sand Filter

1.	Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet])	☒Yes	☐No
2.	Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)?	☒Yes	☐No
3.	If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater?	☒Yes	☐No

4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No
   If No to any question above, then an Austin Sand Filter is not feasible.
5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☒Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section.
   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Design Elements – Austin Sand Filter

* **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 5 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. Is the drawdown time of the 2nd chamber 24 hours? * ☒Yes ☐No
2. Is access for Maintenance vehicles provided to the Austin Sand Filter? * ☒Yes ☐No
3. Is a bypass/overflow provided for storms > WQV? * ☒Yes ☐No
4. Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? ** ☒Yes ☐No
5. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? ** ☒Yes ☐No
6. Can the Austin Sand Filter be placed using an earthen configuration? ** ☐Yes ☒No
   If No, go to Question 9.
7. Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? * ☒Yes ☐No
   If No, design with an impermeable liner.

8. Are side slopes of the earthen chamber 3:1 (h:v) or flatter? * **NA** ☐Yes ☐No
9. Is maximum depth ≤ 13 ft below ground surface? * ☒Yes ☐No
10. Can the Austin Sand Filter be placed in an offline configuration? ** ☐Yes ☒No

AVSF #47

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No
2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No
3. If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater? ☒Yes ☐No
4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.
5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☒Yes ☐No

   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No

   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Design Elements – Austin Sand Filter

* **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 5 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.	Is the drawdown time of the 2nd chamber 24 hours? *	☒Yes	☐No
2.	Is access for Maintenance vehicles provided to the Austin Sand Filter? *	☒Yes	☐No
3.	Is a bypass/overflow provided for storms > WQV? *	☒Yes	☐No
4.	Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? **	☒Yes	☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☒Yes	☐No
6.	Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 9.	☐Yes	☒No
7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? * If No, design with an impermeable liner.	☒Yes	☐No
8.	Are side slopes of the earthen chamber 3:1 (h:v) or flatter? * NA	☐Yes	☐No
9.	Is maximum depth ≤ 13 ft below ground surface? *	☒Yes	☐No
10.	Can the Austin Sand Filter be placed in an offline configuration? **	☐Yes	☒No

AVSF #49

Feasibility – Austin Sand Filter

1.	Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet])	☒Yes	☐No
2.	Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)?	☒Yes	☐No
3.	If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater?	☒Yes	☐No
4.	If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? If No to any question above, then an Austin Sand Filter is not feasible.	☒Yes	☐No
5.	Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? If Yes, continue to Design Elements sections. If No, continue to Question 6.	☒Yes	☐No

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section.
   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

Design Elements – Austin Sand Filter

* **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 5 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. Is the drawdown time of the 2nd chamber 24 hours? * ☒Yes ☐No
2. Is access for Maintenance vehicles provided to the Austin Sand Filter? * ☒Yes ☐No
3. Is a bypass/overflow provided for storms > WQV? * ☒Yes ☐No
4. Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? ** ☒Yes ☐No
5. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? ** ☒Yes ☐No
6. Can the Austin Sand Filter be placed using an earthen configuration? ** ☐Yes ☒No
   If No, go to Question 9.
7. Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? * ☒Yes ☐No
   If No, design with an impermeable liner.
8. Are side slopes of the earthen chamber 3:1 (h:v) or flatter? * **NA** ☐Yes ☐No
9. Is maximum depth ≤ 13 ft below ground surface? * ☒Yes ☐No
10. Can the Austin Sand Filter be placed in an offline configuration? ** ☐Yes ☒No

AVSF #102

Feasibility – Austin Sand Filter

1.	Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet])	☒Yes	☐No
2.	Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)?	☒Yes	☐No
3.	If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater?	☒Yes	☐No
4.	If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? If No to any question above, then an Austin Sand Filter is not feasible.	☒Yes	☐No
5.	Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? If Yes, continue to Design Elements sections. If No, continue to Question 6.	☒Yes	☐No
6.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres If Yes, continue to the Design Elements section. If No, continue to Question 7.	☐Yes	☐No
7.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.	☐Complete	

Design Elements – Austin Sand Filter

* **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 5 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.	Is the drawdown time of the 2nd chamber 24 hours? *	☒Yes	☐No
2.	Is access for Maintenance vehicles provided to the Austin Sand Filter? *	☒Yes	☐No

3.	Is a bypass/overflow provided for storms > WQV? *	☒Yes	☐No
4.	Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? **	☒Yes	☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☒Yes	☐No
6.	Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 9.	☐Yes	☒No
7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? * If No, design with an impermeable liner.	☒Yes	☐No
8.	Are side slopes of the earthen chamber 3:1 (h:v) or flatter? * **NA**	☐Yes	☐No
9.	Is maximum depth ≤ 13 ft below ground surface? *	☒Yes	☐No
10.	Can the Austin Sand Filter be placed in an offline configuration? **	☐Yes	☒No