Caltrans

Dist-County-Route: 07-LA-101
Post Mile Limits: 31.9/32.3
Project Type: Modify Interchange
Project ID (or EA): 0700000419
Program Identification: HE11
Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Los Angeles RWQCB

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: 18.88 Acres Risk Level: 3
Estimated: Construction Start Date: 8/1/2012 Construction Completion Date: 8/1/2014
Notice of Intent (NOI) Date to be submitted: 7/1/2012

Erosivity Waiver Yes ☐ Date: No ☒
Notification of ADL reuse (if Yes, provide date) Yes ☐ Date: 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.

12/19/11
Randy Chapman, P.E.
Registered Project Engineer

12/20/2011
Lohit Reddy Kotha, P.E. Date
Caltrans Designated Oversight Representative

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

Ravi Ghate, Project Manager — 12/20/2011 Date

Roger E Castillo, Designated Maintenance Representative — 12-20-11 Date

for Ron Russak, Designated Landscape Architect Representative — 12/21/11 Date

[Stamp Required for PS&E only] Shirley Pak, District/Regional Design SW Coordinator or Designee — 12/21/2011 Date

STORM WATER DATA INFORMATION

1. Project Description

- This project proposes to replace the existing Lost Hills Road Overcrossing and improves the US 101 and Lost Hills Road Interchange. The proposed improvement will increase roadway width on Lost Hills Road to allow for four lanes with a striped median, and will address operational, traffic, and safety needs. Implementing the interchange improvements will address bridge replacement and local street traffic circulation, as well as the immediate and future needs of the City of Calabasas, County of Los Angeles and California Department of Transportation (Caltrans). Based on right-of-way acquisition requirements and the anticipated increases of traffic capacity at Lost Hills Road interchange, the proposed project was determined to be a Project Development Category 4A project.
- The total disturbed area is estimated at up to 18.88 acres, which is based on the design concept currently under review by Caltrans and the City of Calabasas. Additional impervious area added totals 1.03 acres.
- The project is located within the existing MS4 system limits for the City of Calabasas and the County of Los Angeles. Within the County of Los Angeles the preparation and submittal of a Monitoring Plan to the Los Angeles Regional Water Quality Control Board (LA-RWQCB) is required of all MS4 permittees. The County of Los Angeles has prepared and submitted a plan on behalf of Caltrans and the other permittees in the watershed.
- The build alternative being considered in the PA/ED Phase is described as follows:
    - Alternative 7 (Cloverleaf): Alternative 7 is an alternative consisting of a cloverleaf in the northeast quadrangle of the interchange that provides US-101 northbound access for both directions of travel on Lost Hills Road. The existing US-101 northbound ramp would be removed. Access to the residential community to the northwest of the interchange remains at Canwood Street. Intersections would be signalized and the intersections would be coordinated. The overcrossing would be lengthened to accommodate the anticipated future widening of US-101 to include HOV lanes in both directions. The overcrossing would be widened to 73 feet minimum, and lengthened to 285 feet. The current number of lanes serving the existing on- and off-ramps would remain the same for this alternative, except a cloverleaf would be added for the northbound on-ramp. All four existing ramp intersections would need to be removed and replaced with ramps further from the freeway centerline to accommodate the longer overcrossing. The northbound off-ramp would be realigned to the north to allow for construction of the new cloverleaf ramp and so that vehicles would not have to stop on the Lost Hills Road overcrossing. In addition, northbound left-turn movements from Lost Hills Road to US-101 would be eliminated. Lost Hills Road south of the new overcrossing would have two southbound lanes and three

northbound lanes. North of the overcrossing there would be two southbound lanes and one northbound lane. No changes would be made to the Lost Hills Road/Agoura Road intersection.

- The 18.88 acres of disturbed area for Alternative 7 was determined based upon the addition of a new overcrossing structure, the relocation of both on- and off-ramp locations with the new northbound cloverleaf, and modified Lost Hills Road alignment. Net addition of impervious area is 1.03 acres.
- Alternative 7 is within existing MS4 system limits for the City of Calabasas and the County of Los Angeles. Within the County of Los Angeles the preparation and submittal of a Monitoring Plan to the Los Angeles Regional Water Quality Control Board (LA-RWQCB) is required of all MS4 permittees. The County of Los Angeles has prepared and submitted a plan on behalf of Caltrans and the other permittees in the watershed.

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

- The Los Angeles Regional Water Quality Control Board (LA-RWQCB) has jurisdiction within the project limits
- The project is within the Malibu Creek Hydrologic Area, the Las Virgenes Canyon subarea, with the Hydrologic Unit being the Santa Monica Bay. The hydrologic unit number is 404.22.
- Under 303(d) listing, it has been determined that the project is within one watershed. Within the Malibu Creek Watershed, Las Virgenes Creek is identified as the receiving water. This receiving water (Las Virgenes Creek) has been identified to have the following impairments:
    - Nutrients (algae)
    - Organic Enrichment / Low Dissolved Oxygen
    - Scum / Foam (unnatural)
    - Sedimentation / Siltation
    - Selenium
    - Trash
    - Coliform Bacteria
- 401 certification has been identified as being potentially required for this project.
- The receiving water bodies are not considered high-risk areas used for municipal or domestic water supply.
- The project is a Risk Level 3. Although the receiving water is listed on a 303(d) list as being impaired by sediment, the watershed erosion estimate is 70.55 tons/acre, yielding a sediment risk of medium. Documentation supporting this conclusion is presented later in the Report and is titled “Sediment Risk Factor Worksheet”.
- The project limits are in the Malibu Creek Watershed. The Total Maximum Daily Loads (TMDLs) are as follows:

Established TMDLs

Malibu Creek Watershed Bacteria TMDL

The Malibu Creek Watershed Bacteria TMDL became effective on January 24, 2006. Caltrans is working cooperatively with a group of Responsible Agencies to jointly comply with the TMDL. Project Engineer of projects located where dry weather diversion exists needs only consider infiltration devices for bacteria removal; however, all other projects, shall consider both dry weather flow diversion and infiltration devices.

Malibu Creek Watershed Trash TMDL

The Malibu Creek Trash TMDL became effective on July 7 2009. The TMDL requires the Responsible Agencies, including Caltrans to reduce amount of trash deposited in the waterbody and in the storm water discharges to "zero" in eight (8) years. Responsible Agencies may implement a Minimum Frequency of Assessment and Collection Program in or adjacent to the waterbody or place full capture devices at the drainage outfalls. Project Engineer shall consider treatment controls for the project and consult with the District NPDES Storm Water Coordinator.

Future TMDL

Santa Monica Bay Nearshore and Offshore Debris TMDL

The Santa Monica Bay Nearshore and Offshore Debris TMDL was adopted by the Los Angeles Regional Water Quality Control Board on November 4, 2010. The TMDL requires the Responsible Agencies in the Santa Moncia Bay, Ballona Creek and Malibu Creek Watersheds, including Caltrans, to reduce amount of trash and plastic pellets in the storm water discharges to "zero" in eight (8) years. Responsible Agencies may implement a Minimum Frequency of Assessment and Collection (MFAC) Program in or adjacent to the waterbody or place full capture devices at the drainage outfalls. Project Engineer shall consider treatment controls for the project and consult with the District NPDES Storm Water Coordinator.

- An Initial Site Assessment was performed for this Project Report (PR). There is a potential for aerially deposited lead within the project limits. Additionally, further exploration of potential groundwater contamination may be warranted if dewatering is required for the project due to the presence of the landfill north of the project site.
- A Mitigated Negative Declaration / Finding of No Significant Impact (MND/FONSI) prepared for this Project Approval / Environmental Document (PA/ED) has identified permits from the Army Corps of Engineers (ACOE 404), RWQCB (401), and the California Department of Fish and Game (CDFG 1600) may be required.
- No local agency requirements or concerns have been brought forth for this project.

- The proposed alternatives were prepared in consideration of existing right-of-way, land acquisition requirements, utility systems, and drainage systems.
- There are no seasonal construction restrictions defined by the Los Angeles RWQCB.
- According to National Weather Service Forecast Office, under the modified Köppen classification system, Los Angeles climate is categorized as Mediterranean. This climate type is characterized by pronounced seasonal changes in rainfall--a dry summer and a rainy winter--but relatively modest transitions in temperature. The average annual high and low temperatures in the City of Calabasas are 90 and 40 degrees, respectively. The average annual rainfall is 13.6 inches. Onsite soils are of types B and C.
- Based on information from the State of California Division of Mines, soil types in the project study area consist of younger alluvium (Qyf2, Qf, Qw) and alluvial basin or flood plain deposits (Qa). The younger alluviums are characterized by silty sand and sandy silt with sand, silt and clay. The alluvial basin or flood plain deposits are generally clay with some silt and sandy clay.
- The dominant soil composition in the area of the target property, according to the Soil Conservation Service STATSGO data, is called Hambright.
- US-101 is a widely used transportation route providing local and regional mobility within Los Angeles County. As such, there is the potential for soil containing Aerially Deposited Lead (ADL) to exist along the roadway. Near-surface (upper 3.3 feet) soil samples will need to be collected, tested, and analyzed for lead contamination.
- Additional right-of-way will be acquired for the development of this project, however, no additional right-of-way acquisition or easements are needed for the construction and maintenance of BMPs. Drainage patterns onsite direct flow towards areas within the Caltrans right-of-way. BMPs are designed based on area available for treatment flow, and minimal impervious area increase.
- A right-of-way certification is required for this project. However, the certification process will take place at PS&E phase.
- Caltrans approved Design Pollution Prevention, Treatment, and Construction Site BMPs shall be utilized during construction and post-construction for this project in order to avoid or reduce potential storm water impacts.
- Huitt-Zollars provided topography services through subcontracted aerial photography and provided ground survey. Huitt-Zollars also prepared hydrologic and hydraulic analyses for this project utilizing information provided by the Los Angeles County Department of Public Works. NRCS provided soil data.
- Huitt-Zollars reviewed the Route 101 Corridor Storm Water Management Study for post mile 17.2 to 38.1 in Los Angeles County, dated January 26, 2010. However, since this project will be modifying the existing conditions which the Corridor Study was based on, including the acquisition of new right-of-way, Matrix “A” will be used to select Treatment BMPs to effectively treat these areas.

3. Regional Water Quality Control Board Agreements

- This project does not qualify for a CE (Categorical Exemption), the following permits NPDES Permit No. CAS 000002 and CAS 000003 and RWQCB Section 401 have the following impacts on storm water: location and type of specific construction site BMPs during and post construction.
- The Los Angeles Regional Water Quality Control Board (RWQCB) requires all new/major reconstruction projects that increase impervious area to evaluate the feasibility of post construction Treatment BMP's as a condition of the permit process. It has been determined that the following BMP's will be incorporated into the project: Austin sand media filters, biofiltration swales, and gross solid removal devices to meet the permit requirement.
- Notice of Intent (NOI) will be submitted to Los Angeles RWQCB thirty (30) days before construction begins.
- In the future phases of project development, it is recommended that LA-RWQCB staff be invited to participate with the project development team meetings.
- Coordination with LA-RWQCB regarding the 401 certification will be required during a later phase of the project.

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

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

- The project is anticipated to increase storm water volume due to the slight increase of impervious surface area associated with the improvements and new overcrossing structure. The changes to the existing topography as a result of the improvements will not result in an increase in the velocity of flow within the project limits and should have negligible downstream impacts. Existing storm drains and channels will be extended and realigned to convey project run off to the same locations. A hydrology/hydraulic study is recommended for the PS&E phase to determine peak flows

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

- Cut and fill slopes will be modified and created adjacent to the proposed roadway realignment. Sediment loading will be minimal given the existing slopes are fully vegetated. Any disturbed areas shall be re-vegetated following Caltrans Landscape Replacement Policy
- The proposed overcrossing replacement project will increase the impervious project area by 18.88 ac (max.). This is based upon the realigned Lost Hills Road, revised on- and off-ramps, and new overcrossing structure.
- Existing slope conditions consist of adjacent park and commercial areas with relatively flat, paved areas along with a 2:1 downhill slope to a drainage channel. Proposed slopes will be 2:1 (horizontal:vertical) or flatter for up-slopes and 4:1 or flatter for down-slopes to join existing slopes.

- The total acreage required for post construction BMP implementation will be minimal for slope/surface protection systems, as slope/surface BMPs are incorporated into the proposed design system without adding significant area BMPs used in the treatment of flows in contact with hard surface will be incorporated into the open space that the project creates without adding additional area to the project.
- Existing aesthetic improvements along the northbound US-101 in the vicinity of the project study area include ornamental landscaping along the US-101 northbound on-ramp, both sides of Lost Hills Road north of US-101, and the western side of Lost Hills Road south of US-101. A portion of this landscaping would likely be removed to accommodate the proposed project build alternatives. While this would reduce the visual quality of the area, the landscaping is not a predominant part of the local view shed along US-101 or Lost Hills Road, and does not provide a significant visual resource for the area. All landscape removed due to construction will be replaced following Caltrans policies and procedures.
- New hardscape will consist of the wider and realigned Lost Hills Road, the realigned exit and entrance ramps, and the longer/wider overcrossing structure.

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

- Concentrated project flows are to be conveyed to an existing, realigned storm drain system with capacity upgrades as required to accommodate any additional flows. As identified previously, the implementation of the minimum standard and reduced standard alternatives is expected to result in some modifications to the existing slopes and hardscapes.

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

- The build alternatives evaluated were developed in an attempt to minimize impacts to existing vegetation and minimize the amount of disturbed area through the implementation of retaining walls where feasible and required
- A detailed vegetation identification has not been made at this phase but will be addressed in the PS&E project phase
- Separate costs were not identified for preservation of existing vegetation, as this BMP is inherent in the project's design.

Total Estimated Design Pollution Prevention BMP Cost

- $53,336

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

Treatment BMP Strategy, Checklist T-1

- In accordance to Deputy Directive DD-92 dated March 17, 2008, this project is required to implement all treatment BMPs recommended in the Corridor Stormwater Management Study (Corridor Study) completed on Route 101 (post miles 17.2 to 38.1) dated January 26, 2010. However, since this project will be modifying the existing conditions which the Corridor Study was based on, including the acquisition of new right-of-way, Matrix "A" will be used to select Treatment BMPs to effectively treat these areas.
- The Targeted Design Constituents for this project are nitrogen, phosphorus and sediment. The project also discharges to a water body placed on a 303(d) list for trash.
- Approximately 90% of the WQV/WQF will be treated by the Treatment BMP strategy. The remaining 10% of the WQV/WQF that is not being treated by means of Treatment BMPs is from natural, pervious areas that are being treated by Design Pollution Prevention BMPs discussed in Section 4 of this report.
- The Treatment BMP strategy for the watershed within the project limits is based on BMP selection from "Tier 1" of Matrix "A" for general purpose pollutant removal. Where feasible, the Austin filter (earthen) will be the preferred Treatment BMP for this project. In areas where the construction of the Austin filter is not feasible, biofiltration swales in combination with GSRDs will be used. As this project is in the PA/ED phase, specific design of Treatment BMPs has not been performed.

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

- The project proposes to incorporate Biofiltration Swales throughout the project site. According to the BMP Selection Matrix "A", biofiltration swales fall under the Tier 2 category. As the Austin filter is the preferred Treatment BMP for this project, falling under the Tier 1 category, biofiltration swales will be used in locations where the Austin filter is not feasible due to size and location. Due to the layout of this project, the project design provides excellent opportunities for vegetated strips/swales as a treatment option as well as providing opportunities for Low Impact Development (LID).
- Based on observation of available mapping, the largest tributary area is approximately 8.7 acres. Design storm flow, water quality flow, depth of flow, and velocities will be calculated during the PS&E phase. The WQV is estimated at approximately 15,000 cubic feet.
- As this project is in the PA/ED phase, specific design of the Treatment BMPs are not in place, however, it is assumed at this time that the project will incorporate four biofiltration swales. Tentative locations for the proposed biofiltration swales are

Proposed Treatment BMPs
for
Lost Hills Interchange
Caltrans Project ID: 0700000419

12/19/2011

Corridor Storm Water Management Treatment BMP					Proposed in the SWDR Treatment BMP						Change in WQV (cf)
Site No.	BMP Type	Paved Tributary Area (ac)	Total WQV Paved (cf)	Treatment Credit (cf)	Site No.	Post Mile	BMP Type	Paved Tributary Area (ac)	Total WQV Paved (cf)	Treatment Credit (cf)	
240	MF (AVSF S-10000-4.5)	1.7	4547	3956	1	32.14	MF (AVSF)	1.8	4901	4264	
244	BSW/GSRD	3.2	8821	7233	2	32.04	(2) BSW	1.4	3812	3126	
245A	BSW/GSRD	0.5	1470	1206	3	31.94	GSRD	2.6	7079	5805	
245B	BSW/GSRD	0.6	1497	1228	4	31.93	MF (AVSF)	0.9	2450	2132	
					5	31.83	(2) BSW/GSRD	2.4	6534	5358	
Total		6.0	16335	16341				9.1	24776	20684	8441

Note: WQV values are not directly comparable to the opposite BMP in the same row of the table.
Therefore, the total change in WQV is provided for the overall project site only.

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shown on the Water Pollution Control Map in the Supplemental Attachments of this report.

- $16,800 is estimated as an appropriate cost for Biofiltration Swales.

Dry Weather Diversion, Checklist T-1, Parts 1 and 3

- Dry Weather Diversions are not incorporated into this project. The project does not generate dry weather flows nor is there a sanitary sewer located near the site, therefore, Dry Weather Diversion is not feasible.

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

- Infiltration Devices are not incorporated into this project. According to BMP Selection Matrix "A", since less than 20% of the WQV is anticipated to be infiltrated, infiltration devices are not an option for Tier 1 or 2 ranking categories. Areas where infiltration devices would be feasible are being treated by BMPs listed under the Tier 1 or 2 categories for Matrix "A".

Detention Devices, Checklist T-1, Parts 1 and 5

- Detention Devices are not incorporated into this project. Detention devices are feasible from a design standpoint on this project, and do fall under the Tier 2 category on the BMP Selection Matrix "A", however, other Treatment BMPs such as media filters and biofiltration swales would be more appropriate and cost effective.

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

- GSRDs are incorporated into this project. GSRDs will be used in conjunction with biofiltration swales where media filters are not feasible in order to treat trash as the receiving water is listed on a 303(d) list for trash.
- As this project is in the PA/ED phase, specific design of the Treatment BMPs are not in place, however, it is assumed at this time that the project will incorporate two GSRDs. Tentative locations for the proposed GSRDs are shown on the Water Pollution Control Map in the Supplemental Attachments of this report.
- $200,000 is estimated as an appropriate cost for GSRDs.

Traction Sand Traps, Checklist T-1, Parts 1 and 7

- Traction Sand Traps are not incorporated into the project. Traction Sand or other traction enhancing substances are not applied to the roadway in or adjacent to the project site.

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

- The Austin Sand Media Filter (earthen) will be incorporated into this project. Based on the BMP Selection Matrix "A", the Austin filter is the preferred Treatment BMP for this project. Pretreatment will be provided where applicable to capture sediment and litter.
- As this project is in the PA/ED phase, specific design of the Treatment BMPs are not in place, however, it is assumed at this time that the project will incorporate two earthen media filters. The location of the proposed Austin Sand Media Filters are shown on the Water Pollution Control Map in the Supplemental Attachments of this report.
- $485,598 is estimated as an appropriate cost for Austin Sand Filters (earthen) on the project.
- There appears to be sufficient head to operate the Delaware Filter device (minimum 3') between the inflow and outflow chambers; however, concerns over vector control associated with permanent pools of water make Delaware Filters infeasible.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

- Since the proposed location would not serve a "critical source area", a MCTT would not be feasible.

Wet Basins, Checklist T-1, Parts 1 and 10

- Wet basins are not feasible for this project since there is not a permanent water source of sufficient volume to supply the basin.

Total Estimated Treatment BMP Cost

- $702,398

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

- Temporary Construction Site BMPs were developed in accordance with Appendix C of the Project Planning and Design Guide (PPDG) dated July 2010, along with the most recent cost guidelines from Caltrans Headquarters.
- Construction Site BMP's that have been designated as separate Bid Line Items:
    - SS-4 Hydro seeding
    - SS-5 Soil Binders
    - SS-9 Earth Dikes/Drainage Swales and Ditches
    - SS-10 Outlet Protection/Velocity Dissipation Devices
    - SC-2 Sediment/Desilting Basin
    - SC-6 Gravel Bag Barrier
    - SC-7 Street Sweeping and Vacuuming
    - SC-10 Storm Drain Inlet Protection
    - TC-1 Stabilized Construction Entrance

- Construction Site BMP's that have been incorporated as Lump Sum Items:
    - SS-1 Scheduling
    - SS-2 Preservation of Existing Vegetation
    - WE-1 Wind Erosion Control
    - NS-1 Water Conservation Practices
    - NS-3 Paving and Grinding Operations
    - NS-6 Illicit Connection/Illegal Discharge Detection and Reporting
    - NS-7 Potable Water/Irrigation
    - NS-8 Vehicle and Equipment Cleaning
    - NS-9 Vehicle and Equipment Fueling
    - NS-10 Vehicle and Equipment Maintenance
    - NS-12 Concrete Curing
    - NS-14 Concrete Finishing
    - WM-1 Material Delivery and Storage
    - WM-2 Material Use
    - WM-3 Stockpile Management
    - WM-4 Spill Prevention and Control
    - WM-5 Solid Waste Management
    - WM-6 Hazardous Waste Management
    - WM-7 Contaminated Soil Management
    - WM-8 Concrete Waste Management
    - WM-9 Sanitary/Septic Waste Management
    - WM-10 Liquid Waste Management
- Dewatering will not be required during construction of the project.
- At the time of the PA/ED phase, an active treatment system (ATS) is not anticipated to be used on the project as this is a Risk Level 3 site. When the design is finalized during the PS&E phase, this issue will be re-evaluated.
- On February 1, 2011, Aythem Al-Saleh, District Storm Water Coordinator, agreed to the Temporary Construction Site BMP strategy used for the scope of this project.
- Temporary construction site BMP costs are included in the Project Study Report – Project Development Support Cost Estimate. The proposed strategy would be to not allow dirt and debris to leave the project site during the entire construction duration using the items listed above.

Total Estimated Temporary Construction Site BMPs Cost

- $539,665

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlet stenciling is required at all storm drain inlets and catch basins. Any existing or new basins within the project limits along publicly accessible streets (not the ramps) must have "NO DUMPING – DRAINS TO OCEAN" with appropriate graphical icon stenciled on the sidewalk at each drain.

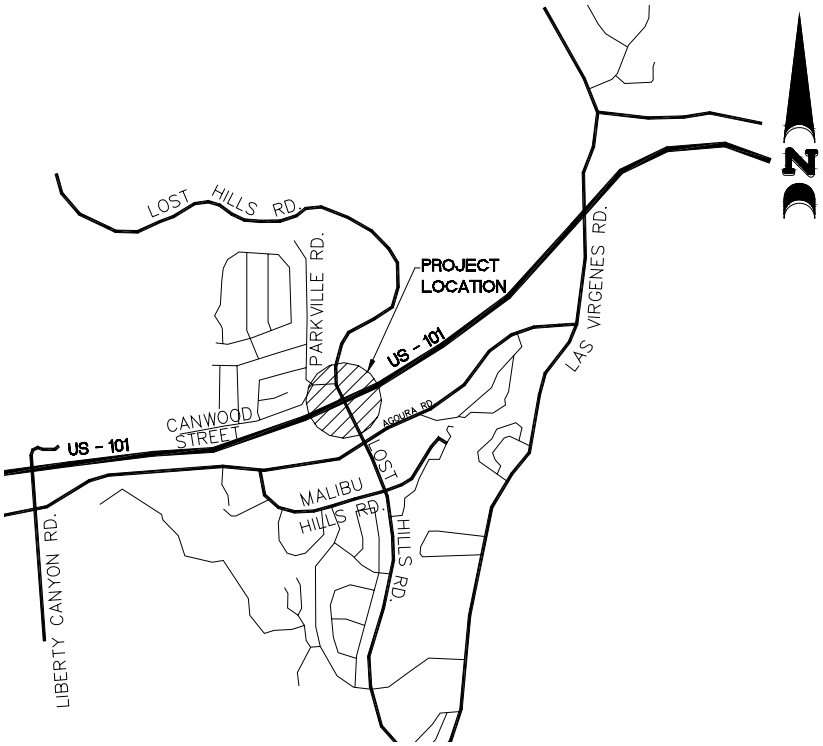
Required Attachments

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

Supplemental Attachments

- Storm Water BMP Cost Summary
- BMP cost information from: Project Planning Cost Estimate (PPCE) during PID and PA/ED project phases
- 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)
- Checklists T-1, Parts 1–10 (Treatment BMPs)
- BMP Implementation Plan

Vicinity Map and Project Limits



FOR IMPROVEMENTS TO THE

U.S. 101/LOST HILLS ROAD INTERCHANGE

IN THE CITY OF CALABASAS, CALIFORNIA

07-LA-101-(LA)

31.9/32.3

Replace Lost Hills Road Overcrossing

Modify Interchange

ID 0700000419

DATE: 9/24/2010

Project ID (or EA): 242300

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. _____ *(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**. *(Los Angeles County)*, 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. *1.03 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.	

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

	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**		80.02
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**		0.24
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**		5.64
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	108.32	
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			

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: Lost Hills Interchange - 242300
Start Date: 08/01/2012
End Date: 08/01/2014
Latitude: 34.1416
Longitutde: -118.7091

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **80.02** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **08/01/2012** - **08/01/2014**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.

Start Over

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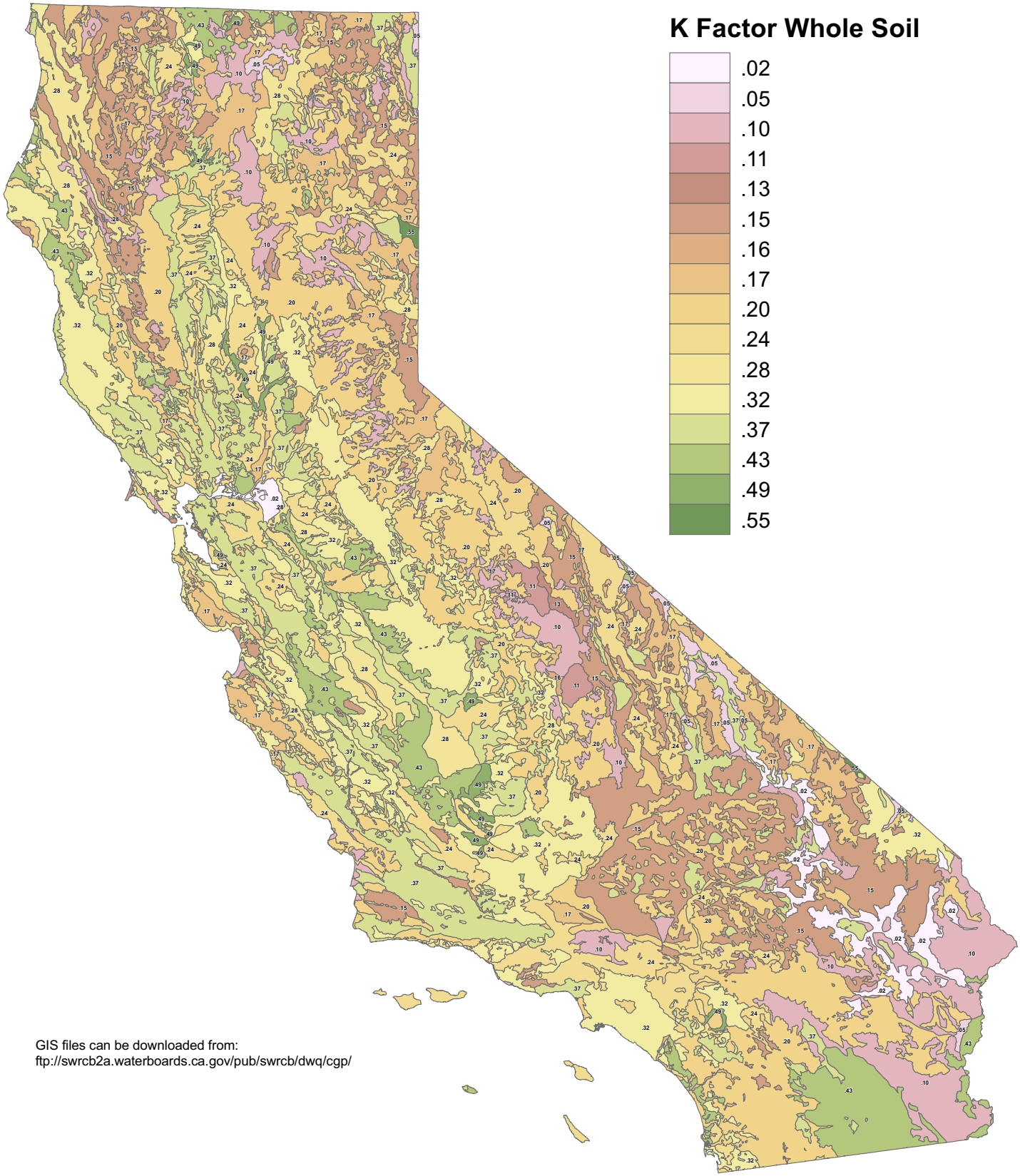
You will need Adobe Reader to view some of the files on this page. See EPA's PDF page to learn more.

RUSLE K Values

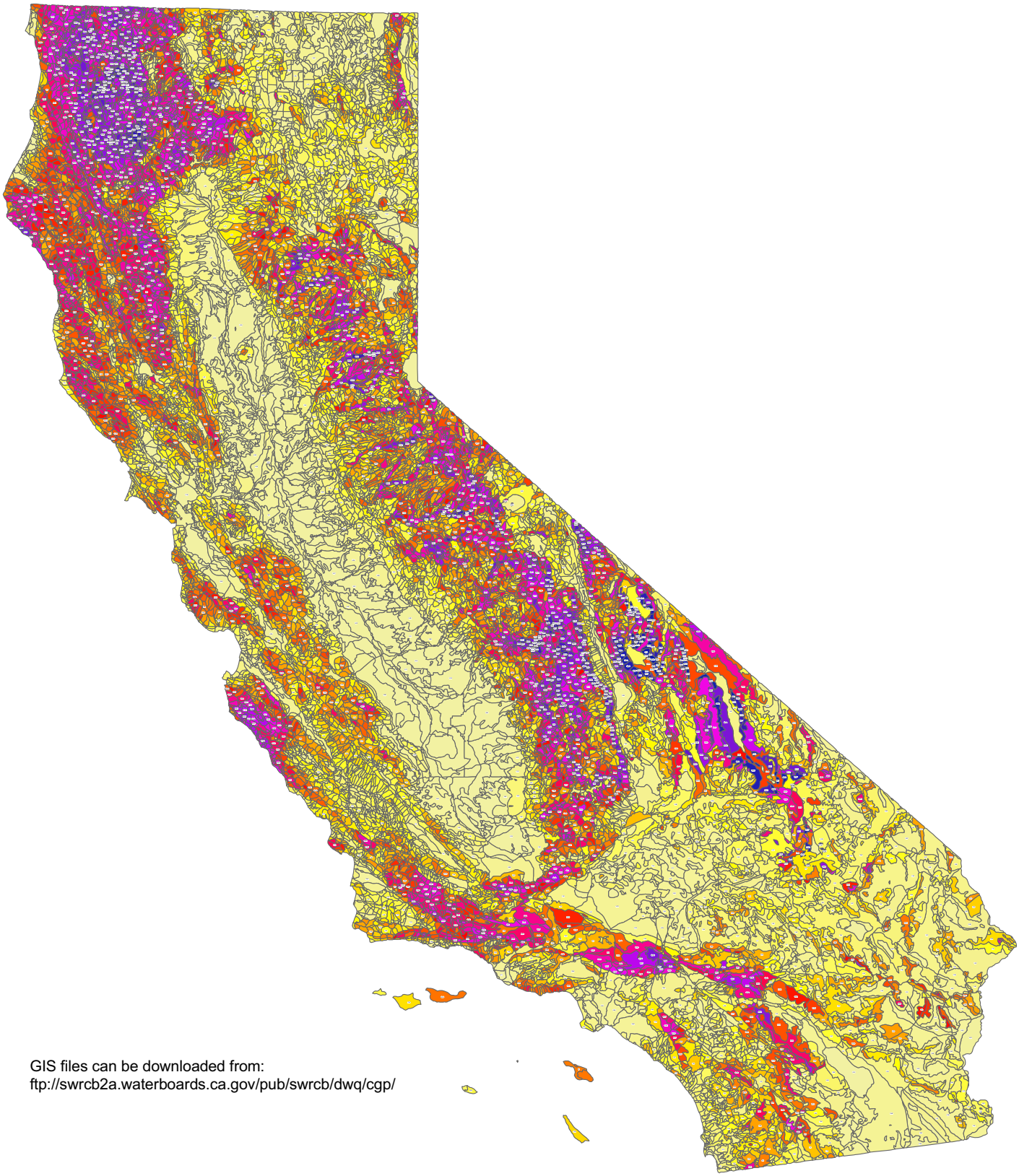


GIS files can be downloaded from:
ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/

Water Boards

Data Source: *Natural Resources Conservation Service,*
U.S. Dept. of Agriculture and State Water Resources Control Board

RUSLE LS Values



GIS files can be downloaded from:
ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/

Water Boards

Data Source:*State Water Resources Control Boards and*

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) or has a **USEPA approved TMDL implementation plan for sediment**?: 2006 Approved Sediment-impared WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml	**yes**	**High**
OR		
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		

Combined Risk Level Matrix

Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	
High	Level 2		Level 3

Project Sediment Risk: **High**

Project RW Risk: **High**

Project Combined Risk: **Level 3**

Storm Water BMP Cost Summary

Project Name:	**Lost Hills Interchange**
District:	**7**
ID:	**0700000419**
County:	**Los Angeles**
Route:	**US 101**
Postmile:	**31.9**
End Postmile:	**32.3**

Total Treatment BMP Costs	$ 702,398
Total Design Pollution Prevention BMP Costs	$ 53,336
Total Permanent Storm Water BMP Costs	$ 755,734
Subtotal Soil Stabilization BMPs	$ 69,138
Subtotal Sediment Control BMPs	$ 169,427
Subtotal Wind Erosion Control BMPs	$ 5,000
Subtotal Tracking Control BMPs	$ 21,000
Subtotal Waste Management & Materials Handling BMPs	$ 50,000
Subtotal Non-Storm Water Management	$ 21,500
Subtotal Miscellaneous Items	$ 203,600
Total Construction Site BMP Costs	$ 539,665
TOTAL COST FOR STORM WATER BMPs	$ 1,295,399

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

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				ft^2		$ -
	Biofiltration Swale			4	EA	$4,200	$ 16,800
	Dry Weather Diversion				EA		$ -
	Infiltration Devices (Trench)				EA		$ -
	Infiltration Devices (Basin)				EA		$ -
	Detention Devices				EA		$ -
	Gross Solid Removal Devices			2	EA	$100,000	$ 200,000
	Traction Sand Traps				EA		$ -
	Media Filters (Austin)			2	EA	$242,799	$ 485,598
	Media Filters (Delaware)				EA		$ -
	Wet Basins				EA		$ -
	Multi Chamber Treatment Train (MCTT)				EA		$ -
				Total Treatment BMP Costs			$ 702,398

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				LS		$ -
	Slope/Surface Protection Systems-Hard Surfaces						
	- Slope Paving				ft^2		$ -
	- Rock Slope Protection				ft^2		$ -
	Slope/Surface Protection Systems-Vegetated Surfaces						
	- Landscape Planting			1	LS	$5,000	$ 5,000
	- Erosion Control [Erosion Control (Type D), Erosion Control Blanket, etc.]			12	ac	$4,028	$ 48,336
	Concentrated Flow Conveyance Systems						
	- Preservation of Existing Vegetation				ft^2		$ -
				Total Design Pollution Prevention BMP Costs			$ 53,336

Total Permanent Storm Water BMP Costs	**$ 755,734**

Storm Water BMP Cost Summary

Temporary Construction Site BMPs

ID	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						
SS-1	074037	Move-In/Move-out (Temporary Erosion Control)	07-485	No		EA		$ -
SS-1		Scheduling		No	1	LS	5,000	$ 5,000
SS-2		Preservation of Exist Vegetation		No	1	LS	6,000	$ 6,000
SS-2	071325	Temporary Fence (Type ESA)	07-446	Yes		ft		$ -
SS-2		Environmentally Sensitive Area	S5-760	No		LS		$ -
SS-2		Preservation of Property	07-450	No		LS		$ -
SS-3	074039	Hydraulic Mulch	07-350	No		ft^2		$ -
SS-3	074039	Temp. Hydraulic Mulch (Bonded Fiber Matrix)	07-381	No		ft^2		$ -
SS-3	074040	Temp. Hydraulic Mulch (Polymer Stabilized Fiber Matrix)	07-382	No		ft^2		$ -
SS-4	074023	Temporary Erosion Control (Hydroseeding)	07-350	No	11.5	ac	1,700	$ 19,550
SS-5	074025	Soil Binders		No	11.5	ft^2	975	$ 11,213
SS-5	074040	Bonded Fiber Matrix	07-XYZ	No		ft^2		$ -
SS-6		Straw Mulch	07-350	No		ft^2		$ -
SS-7		Geotextiles, Mats/Plastic Covers and Erosion Control Blankets				ft^2		$ -
SS-7	074034	Plastic Covers	07-395	Yes		ft^2		$ -
SS-7	074027	Erosion Control Blankets/Mats	07-390	Yes		ft^2		$ -
SS-8		Wood Mulching		No		ft^2		$ -
SS-8	074026	Temporary Mulch	07-380	No		ft^2		$ -
		Earthwork w/edits for Trackwalking	19-010	No		ft^2		$ -
		Temporary Concentrated Flow Conveyance Controls						
SS-9		Earth Dikes/Drainage Swales & Lined Ditches		No	5125	ft	3	$ 15,375
SS-10		Outlet Protection/Velocity Dissipation Devices			3	EA	4,000	$ 12,000
SS-10		Flared Culvert End Sections	70-1.02C			EA		
SS-11		Slope Drains		No		ft		$ -
SS-11		Overside Drains	69-010, 020, 030, 100, 500			ft		$ -
SS-12		Streambank Stabilization				ft		$ -
						Subtotal Soil Stabilization BMPs		**$ 69,138**

Storm Water BMP Cost Summary

ID	BEES	*Temporary Sediment Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
SC-1	074029	Silt Fence	07-430	Yes		ft		$ -
SC-2		Sediment/Desilting Basin		No	1	EA	$6,500	$ 6,500
SC-2		Temporary Sediment Basin	07-436	Yes		EA		$ -
SC-3		Sediment Trap		No		EA		$ -
SC-4		Check Dam				EA		$ -
SC-4	074035	Temporary Check Dams	07-415	Yes		EA		$ -
SC-5	074028	Fiber Rolls	07-420	Yes		ft^2		$ -
SC-6	074031	Gravel Bag Berm	07-470	No	34209	ft	$3	$ 102,627
SC-7	074041	Street Sweeping and Vacuuming	07-360	No	1	LS	$12,000	$ 12,000
SC-8		Sandbag Barrier		No		ft	$3	$ -
SC-9	074030	Straw Bale Barrier	07-460	Yes		ft		$ -
SC-10	074038	Storm Drain Inlet Protection	07-490	Yes	42	EA	$1,150	$ 48,300
	070069	DI Marker and Install DI Marker		Yes		EA		$ -
	700617	Drainage Inlet Marker	07-015	Yes		EA		$ -
							Subtotal Sediment Control BMPs	**$ 169,427**

ID	BEES	*Temporary Wind Erosion Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
WE-1		Wind Erosion Control		No	1	LS	5,000	$ 5,000
SS-5		Dust Palliative	18-010	No		ton		$ -
SS-7	074034	Plastic Covers	07-395	Yes		ft^2		$ -
							Subtotal Wind Erosion Control BMPs	**$ 5,000**

ID	BEES	*Temporary Tracking Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
TC-1	074033	Stabilized Constr. Entrance/Exit	07-480	Yes	7	EA	3,000	$ 21,000
TC-2		Stabilized Construction Roadway	07-481	Yes		LS		$ -
TC-3		Entrance/Outlet Tire Wash		No		EA		$ -
							Subtotal Tracking Control BMPs	**$ 21,000**

ID	BEES	*Temporary Waste Management Control*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
WM-1	CSM*	Material Delivery and Storage	07-346	No	1	LS	5,000	$ 5,000
WM-2	CSM*	Material Use	07-346	No	1	LS	2,000	$ 2,000
WM-3	CSM*	Stockpile Management	07-346	No	1	LS	5,500	$ 5,500
WM-4	CSM*	Spill Prevention and Control	07-346	No	1	LS	2,500	$ 2,500
WM-5	CSM*	Solid Waste Management	07-346	No	1	LS	3,000	$ 3,000
WM-6	CSM*	Hazardous Waste Management	07-346	No	1	LS	7,500	$ 7,500
WM-7	CSM*	Contaminated Soil Management	07-346	No	1	LS	12,500	$ 12,500
WM-8		Concrete Waste Management	07-346	No	1	LS	2,000	$ 2,000
WM-8	074032	Temporary Concrete Washout	07-405	Yes		EA		$ -
WM-8	074042	Temp Conc Washout (Portable)	07-406	No		LS		$ -
		Grinding PCC (Displ of PCC Pavemt Grooving & Grinding Residues)	42-600	No		LS		$ -
WM-9	CSM*	Sanitary/Septic Waste Managemt	07-346	No	1	LS	5,000	$ 5,000
WM-10	CSM*	Liquid Waste Management	07-346	No	1	LS	5,000	$ 5,000
							Subtotal Waste Management & Materials Handling BMPs	$ 50,000

Storm Water BMP Cost Summary

ID	BEES	*Temporary Non-Storm Water Management*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
NS-1	CSM*	Water Conservation Practices	07-346	No	1	LS	2,500	$ 2,500
NS-2	CSM*	Dewatering Operations	07-341	No		LS		$ -
NS-3	CSM*	Paving & Grinding Operations			1	LS	2,000	$ 2,000
		Pavements	S5-250	No		ft^2		$ -
NS-4		Temporary Stream Crossing	07-495	No		LS		$ -
NS-5		Clear Water Diversion		No		LS		$ -
NS-6	CSM*	Illicit Connection/Illegal Discharge Detection and Reporting	07-346	No	1	LS	500	$ 500
NS-7	CSM*	Potable Water/Irrigation	07-346	No	1	LS	5,000	$ 5,000
NS-8	CSM*	Vehicle and Equipment Cleaning	07-346	No	1	LS	2,500	$ 2,500
NS-9	CSM*	Vehicle and Equipment Fueling	07-346	No	1	LS	2,500	$ 2,500
NS-10	CSM*	Vehicle and Equipmt Maintenance	07-346	No	1	LS	2,500	$ 2,500
NS-11	CSM*	Pile Driving Operations	07-346	No		LS		$ -
NS-12	CSM*	Concrete Curing	07-346	No	1	LS	2,000	$ 2,000
NS-13	CSM*	Material & Equipmt use over water	07-346	No		LS		$ -
NS-14	CSM*	Concrete Finishing	07-346	No	1	LS	2,000	$ 2,000
NS-15	CSM*	Structure Demolition/Removal Over or Adjacent to Water	07-346	No		LS		$ -
NS-16		Temporary Batch Plants				LS		$ -
NS-17		Streambank Stabilization				LS		$ -
	CSM*	***Construction Site Management**	07-346	No		LS		$ -
			Subtotal Non-Storm Water Management					$ 21,500

ID	BEES	*Miscellaneous Items*	SSP/nSSP (#, Y or N)	STD. Det. (Y or N)	Quantity	Unit	Unit Cost ($/Unit)	Cost
	074017	Prepare Water Pollution Control Program	07-340	No		LS	6,000	$ -
	074019	Prepare Storm Water Pollution Prevention Plan	07-345	No	1	LS	10,000	$ 10,000
	066596	Additional Water Pollution Control			1	LS	3,200	$ 3,200
	066595	Water Pollution Control Maintenance Sharing			1	LS	10,000	$ 10,000
	066596	Additional Water Pollution Control			1	LS	128,500	$ 128,500
	066597	Storm Water Sampling and Analysis		No		LS		$ -
		Payments (< 1 acre)	S5-250			LS		$ -
		Rock Blanket	20-080			LS		$ -
		Slope Protection	72-010			LS		$ -
		Slope Paving	72-200			LS		$ -
		Temporary Sand Bag Barrier	07-???			LS		$ -
		Temporary Sediment Basin	07-???			LS		$ -
		Temporary Creek Diversion System	07-???			LS		$ -
	074056	Rain Event Action Plan			1	LS	23,400	$ 23,400
	074057	Storm Water Annual Report			1	LS	4,000	$ 4,000
	074058	Storm Water Sampling and Analysis Day			1		24,500	$ 24,500
		Relations w/RWQCB	S5-630			LS		$ -
		Order of Work	05-020			LS		$ -
				Subtotal Miscellaneous Items				**$ 203,600**

Total Construction Site BMP Costs	**$ 539,665**

Quantities for Construction Site BMPs					
Temporary Construction Site BMPs					
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Temporary Soil Stabilization				
SS-1	Scheduling	X	1.0	LS	Estimated cost
SS-2	Preservation of Ex. Vegetation	X	1.0	LS	Estimated cost
SS-4	Hydroseeding		11.5	Ac	Cost from Caltrans bid results
SS-5	Soil Binders		11.5	Ac	Cost from Caltrans bid results
SS-9	Earth Dikes/Drainage Swales & Lined Ditches		5,125.0	LF	Estimated cost
SS-10	Outlet Protection/Velocity Dissipation Devices		3.0	EA	Cost from online SWPPP implementation research
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Temporary Sediment Control				
SC-2	Sediment/Desilting Basin		1.0	EA	Cost from online SWPPP implementation research
SC-6	Gravel Bag Barrier		34,209.0	LF	Cost from Caltrans bid results
SC-7	Street Sweeping & Vacuuming	X	1.0	LS	Cost from Caltrans bid results
SC-10	Inlet Protection		42.0	EA	Cost from online SWPPP implementation research
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Temporary Wind Erosion Control				
WE-1	Wind Erosion Control	X	1.0	LS	Estimated cost
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Temporary Tracking Control				
TC-1	Construction Entrance		7.0	EA	Cost from Caltrans bid results
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Temporary Waste Management Control				
WM-1	Material Delivery and Storage	X	1.0	LS	Estimated cost
WM-2	Material Use	X	1.0	LS	Estimated cost
WM-3	Stockpile Management	X	1.0	LS	Estimated cost
WM-4	Spill Prevention and Control	X	1.0	LS	Estimated cost
WM-5	Solid Waste Management	X	1.0	LS	Estimated cost
WM-6	Hazardous Waste Management	X	1.0	LS	Estimated cost
WM-7	Contaminated Soil Management	X	1.0	LS	Estimated cost
WM-8	Concrete Waste Management	X	1.0	LS	Estimated cost
WM-9	Sanitary/Septic Waste Management	X	1.0	LS	Estimated cost
WM-10	Liquid Waste Management	X	1.0	LS	Estimated cost
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Temporary Non-Stormwater Management				
NS-1	Water Conservation Practices	X	1.0	LS	Estimated cost
NS-3	Paving and Grinding Ops	X	1.0	LS	Estimated cost
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	X	1.0	LS	Estimated cost
NS-7	Potable Water / Irrigation	X	1.0	LS	Estimated cost

NS-8	Vehicle and Equipment Cleaning	X	1.0	LS	Estimated cost
NS-9	Vehicle and Equipment Fueling	X	1.0	LS	Estimated cost
NS-10	Vehicle and Equipment Maintenance	X	1.0	LS	Estimated cost
NS-12	Concrete Curing	X	1.0	LS	Estimated cost
NS-14	Concrete Finishing	X	1.0	LS	Estimated cost
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
	Miscellaneous Items				
	SWPPP Development and Implementation	X	1.0	LS	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
Treatment BMPs					
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Comments**
Treatment	Biofiltration Swales		4.0	EA	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
Treatment	Austin Sand Filter (earthen)		2.0	EA	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
Treatment	Gross Solid Removal Device		2.0	EA	Cost from Appendix F of the Caltrans Storm Water Quality Handbook

Overall Project Costs - Construction Site BMPs							
Temporary Construction Site BMPs							
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Temporary Soil Stabilization						
SS-1	Scheduling	X	1.0	LS	$ 5,000.00	$ 5,000.00	Estimated cost
SS-2	Preservation of Ex. Vegetation	X	1.0	LS	$ 6,000.00	$ 6,000.00	Estimated cost
SS-4	Hydroseeding		11.5	Ac	$ 1,700.00	$ 19,518.16	Cost from Caltrans bid results
SS-5	Soil Binders		11.5	Ac	$ 975.00	$ 11,194.24	Cost from Caltrans bid results
SS-9	Earth Dikes/Drainage Swales & Lined Ditches		5,125.0	LF	$ 3.00	$ 15,375.00	Estimated cost
SS-10	Outlet Protection/Velocity Dissipation Devices		3.0	EA	$ 4,000.00	$ 12,000.00	Cost from online SWPPP implementation research
			Subtotal Soil Stabilization BMPs			**$ 69,087.40**	
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Temporary Sediment Control						
SC-2	Sediment/Desilting Basin		1.0	EA	$ 6,500.00	$ 6,500.00	Cost from online SWPPP implementation research
SC-6	Gravel Bag Barrier		34,209.0	LF	$ 3.00	$ 102,627.00	Cost from Caltrans bid results
SC-7	Street Sweeping & Vacuuming	X	1.0	LS	$ 12,000.00	$ 12,000.00	Cost from Caltrans bid results
SC-10	Inlet Protection		42.0	EA	$ 1,150.00	$ 48,300.00	Cost from online SWPPP implementation research
			Subtotal Sediment Control BMPs			**$ 169,427.00**	
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Temporary Wind Erosion Control						
WE-1	Wind Erosion Control	X	1.0	LS	$ 5,000.00	$ 5,000.00	Estimated cost
			Subtotal Wind Erosion Control BMPs			**$ 5,000.00**	
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Temporary Tracking Control						
TC-1	Construction Entrance		7.0	EA	$ 3,000.00	$ 21,000.00	Cost from Caltrans bid results
			Subtotal Tracking Control BMPs			**$ 21,000.00**	
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Temporary Waste Management Control						
WM-1	Material Delivery and Storage	X	1.0	LS	$ 5,000.00	$ 5,000.00	Estimated cost
WM-2	Material Use	X	1.0	LS	$ 2,000.00	$ 2,000.00	Estimated cost
WM-3	Stockpile Management	X	1.0	LS	$ 5,500.00	$ 5,500.00	Estimated cost
WM-4	Spill Prevention and Control	X	1.0	LS	$ 2,500.00	$ 2,500.00	Estimated cost
WM-5	Solid Waste Management	X	1.0	LS	$ 3,000.00	$ 3,000.00	Estimated cost
WM-6	Hazardous Waste Management	X	1.0	LS	$ 7,500.00	$ 7,500.00	Estimated cost
WM-7	Contaminated Soil Management	X	1.0	LS	$ 12,500.00	$ 12,500.00	Estimated cost
WM-8	Concrete Waste Management	X	1.0	LS	$ 2,000.00	$ 2,000.00	Estimated cost
WM-9	Sanitary/Septic Waste Management	X	1.0	LS	$ 5,000.00	$ 5,000.00	Estimated cost
WM-10	Liquid Waste Management	X	1.0	LS	$ 5,000.00	$ 5,000.00	Estimated cost
			Subtotal Waste Management Control BMPs			**$ 50,000.00**	
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Temporary Non-Stormwater Management						
NS-1	Water Conservation Practices	X	1.0	LS	$ 2,500.00	$ 2,500.00	Estimated cost
NS-3	Paving and Grinding Ops	X	1.0	LS	$ 2,000.00	$ 2,000.00	Estimated cost
NS-6	Illicit Connection/Illegal Discharge Detection and Reporting	X	1.0	LS	$ 500.00	$ 500.00	Estimated cost
NS-7	Potable Water / Irrigation	X	1.0	LS	$ 5,000.00	$ 5,000.00	Estimated cost
NS-8	Vehicle and Equipment Cleaning	X	1.0	LS	$ 2,500.00	$ 2,500.00	Estimated cost

NS-9	Vehicle and Equipment Fueling	X	1.0	LS	$ 2,500.00	$ 2,500.00	Estimated cost
NS-10	Vehicle and Equipment Maintenance	X	1.0	LS	$ 2,500.00	$ 2,500.00	Estimated cost
NS-12	Concrete Curing	X	1.0	LS	$ 2,000.00	$ 2,000.00	Estimated cost
NS-14	Concrete Finishing	X	1.0	LS	$ 2,000.00	$ 2,000.00	Estimated cost
		Subtotal Non-Stormwater Management BMPs				**$ 21,500.00**	
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Miscellaneous Items						
	SWPPP Development and Implementation	X	1.0	LS	$ 10,000.00	$ 10,000.00	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
	Additional Water Pollution Control	X	1.0	LS	$ 131,700.00	$ 131,700.00	Cost from Caltrans Estimating Guidance for CGP
	Water Pollution Control Maintenance Sharing	X	1.0	LS	$ 10,000.00	$ 10,000.00	Cost from Caltrans Estimating Guidance for CGP
	Rain Event Action Plan	X	1.0	LS	$ 23,400.00	$ 23,400.00	Cost from Caltrans Estimating Guidance for CGP
	Storm Water Annual Report	X	1.0	LS	$ 4,000.00	$ 4,000.00	Cost from Caltrans Estimating Guidance for CGP
	Storm Water Sampling and Analysis Day		1.0	LS	$ 24,500.00	$ 24,500.00	Cost from Caltrans Estimating Guidance for CGP
			Subtotal Miscellaneous BMPs			**$ 203,600.00**	
Design Pollution Prevention BMPs							
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Landscape Planting	X	1.0	LS	$ 5,000.00	$ 5,000.00	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
	Erosion Control	X	12.0	ac	$ 4,028.00	$ 48,336.00	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
		Subtotal Design Pollution Prevention BMPs				**$ 53,336.00**	
Treatment BMPs							
BMP	**Description**	**Project-Wide**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Comments**
	Biofiltration Swales		4.0	EA	$ 4,200.00	$ 16,800.00	Cost from Appendix F of the Caltrans Storm Water Quality Handbook
	Austin Sand Filter (earthen)		2.0	EA	$ 242,799.00	$ 485,598.00	Cost from Caltrans bid results
	Gross Solid Removal Device		2.0	EA	$ 100,000.00	$ 200,000.00	Estimated cost
			Subtotal Treatment BMPs			**$ 702,398.00**	
					Total Cost	***$ 1,295,348.40***	
					Contingency	***$ 259,069.68***	
					Budget Cost	***$ 1,554,418.08***	

Checklist SW-1, Site Data Sources

Prepared by: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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	
• Aerial Survey / Huitt-Zollars	2/26/2009
• USGS Topography for Surrounding Areas / Huitt-Zollars	2/26/2009
• Landscape Analysis / Huitt-Zollars	2/26/2009
Hydraulic	
• Drainage Area / Huitt-Zollars	5/25/2009
•	
•	
Soils	
• Web Soils Survey / NRCS	2/26/2009
• NRCS Soil Survey Report	2/26/2009
•	
Climatic	
• Isohyet Maps / Los Angeles County Dept of Public Works	2/26/2009
•	
•	
Water Quality	
• ISA / Corridor Report	9/27/2010
• Receiving Bodies of Water / Corridor Report	9/27/2010
• TMDL, WQV, and WQF / Corridor Report	9/27/2010
Other Data Categories	
•	
•	
•	

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32/3 Project ID (or EA): 242300 RWQCB: Los Angeles

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).	☒ Complete	☐ NA
2.	For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒ Complete	☐ NA
3.	Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☐ Complete	☒ NA
4.	Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒ Complete	☐ NA
5.	Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☐ Complete	☒ NA
6.	Determine if a 401 certification will be required.	☒ Complete	☐ NA
7.	List rainy season dates.	☒ Complete	☐ NA
8.	Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒ Complete	☐ NA
9.	If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒ Complete	☐ NA
10.	Determine contaminated soils within the project area.	☐ Complete	☒ NA
11.	Determine the total disturbed soil area of the project.	☒ Complete	☐ NA
12.	Describe the topography of the project site.	☒ Complete	☐ NA
13.	List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒ Complete	☐ NA
14.	Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☐ Complete	☒ NA
15.	Determine 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.	☐ Complete	☒ NA
17.	Determine if project area has any slope stabilization concerns.	☒ Complete	☐ NA
18.	Describe the local land use within the project area and adjacent areas.	☒ Complete	☐ NA
19.	Evaluate the presence of dry weather flow.	☒ Complete	☐ NA

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

Prepared by: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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)? ☒Yes ☐No

   If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.
6. Are new or disturbed slopes > 2:1 (h:v)? ☐Yes ☒No

   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).
7. Estimate the net new impervious area that will result from this project. 1.03 acres ☒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? ☒Yes ☐No

   If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations. ☒Complete

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

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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: Huitt-Zollars Date: 12/21/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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% ☒Complete
   ___ 20 % - 50%
   ___ 50% - 90%
   ___ > 90%

   (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)
_X_ < 20%	_X_ < 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
☒ phosphorus
☒ nitrogen
☐ copper (dissolved or total)
☐ lead (dissolved or total)
☐ 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

    __X_ 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
    __X_ Detention Devices: Checklist T-1, Part 5
    __X_ GSRDs: Checklist T-1, Part 6
    ____ Traction Sand Traps: Checklist T-1, Part 7
    __X_ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
    __X_ Multi-Chambered Treatment Train: Checklist T-1, Part 9
    __X_ 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): _____80____% ☒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): _____99____% ☒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: Huitt-Zollars Date: 12/21/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

Biofiltration Swales / Biofiltration Strips

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 ☐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. ☐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 5

Prepared by: Huitt-Zollars Date: 9/24/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

Detention Devices

Feasibility

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

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☐Yes ☒No

   Only answer (b) if the Detention Device is being used also to capture traction sand.

   2b) Is the total volume of the Detention Device at least equal to the WQV plus the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)? ☐Yes ☐No

3. Is basin invert ≥ 10 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

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

4. Does adequate area exist within the right-of-way to place Detention Device(s)? ☐Yes ☐No

   If Yes, continue to the 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 Detention Device(s) 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 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 this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 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 geotechnical integrity of the site been evaluated to determine potential impacts to surrounding slopes due to incidental infiltration? If incidental infiltration through the invert of an unlined Detention Device is a concern, consider using an impermeable liner. * ☐Yes ☐No
2. Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? * ☐Yes ☐No
3. Can a minimum freeboard of 12 inches be provided above the overflow event elevation? * ☐Yes ☐No
4. Is an overflow outlet provided? * ☐Yes ☐No
5. Is the drawdown time of the Detention Device within 24 to 72 hours with 40-hrs the preferred design drawdown time? * ☐Yes ☐No
6. Is the basin outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? * ☐Yes ☐No
7. Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? * ☐Yes ☐No
8. Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas.* ☐Yes ☐No
9. Has sufficient access for Maintenance been provided? * ☐Yes ☐No
10. Is the side slope 4:1 (h:v) or flatter for interior slopes? ** ☐Yes ☐No
    (Note: Side slopes up to 3:1 (h:v) allowed with approval by District Maintenance.)
11. If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? ** ☐Yes ☐No
12. Is flow path as long as possible (≥ 2:1 length to width ratio at WQV elevation is recommended)? ** ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 6

Prepared by: Huitt-Zollars Date: 12/21/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

Gross Solids Removal Devices (GSRDs)

Feasibility

1. Is the receiving water body downstream of the tributary area to the proposed GSRD on a 303(d) list or has a TMDL for litter been established? ☒Yes ☐No
2. Are the devices sized for flows generated by the peak drainage facility design event or can peak flow be diverted? ☒Yes ☐No
3. Are the devices sized to contain gross solids (litter and vegetation) for a period of one year? ☒Yes ☐No
4. Is there sufficient access for maintenance and large equipment (vacuum truck)? ☒Yes ☐No

   If "No" to any question above, then Gross Solids Removal Devices are not feasible. Note that Biofiltration Systems, Infiltration Devices, Detention Devices, Dry Weather Flow Diversion, MCTT, Media Filters, and Wet Basins may be considered for litter capture, but consult with District/Regional NPDES if proposed to meet a TMDL for litter.

5. Does adequate area exist within the right-of-way to place Gross Solids Removal Devices? ☒Yes ☐No
   If "Yes", continue to Design Elements section. 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 Gross Solids Removal Devices and how much right-of-way would be needed? _____ acres ☐Yes ☐No
   If "Yes", continue to 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

Design Elements – Linear Radial Device

* **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. Does sufficient hydraulic head exist to place the Linear Radial GSRD? * ☒Yes ☐No
2. Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by Maintenance) used to size the device? * ☒Yes ☐No
3. Were the standard detail sheets used for the layout of the devices? ** ☒Yes ☐No
   If No, consult with Headquarters Office of Storm Water Management and District/Regional NPDES.
4. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * ☒Yes ☐No

Design Elements – Inclined Screen

* **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. Does sufficient hydraulic head exist to place the Inclined Screen GSRD? * ☒Yes ☐No
2. Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by Maintenance) used to size the device? * ☒Yes ☐No
3. Were the standard details sheets used for the layout of the devices? ** ☒Yes ☐No
   If No, consult with Headquarters Office of Storm Water Management and District NPDES.
4. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * ☒Yes ☐No

Treatment BMPs

Checklist T-1, Part 8

Prepared by: Huitt-Zollars Date: 12/21/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

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.

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.

Feasibility- Delaware Filter

1. Is the volume of the Delaware Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet], consult with District/Regional Design Storm Water Coordinator if a lesser volume is under consideration.) ☒Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? ☒Yes ☐No

3. Would a permanent pool of water be allowed by the local vector control agency? Confirm that check valves and vector proof lid as shown on standard detail sheets will be allowed, is used. ☐Yes ☒No

If No to any question, then a Delaware Filter is not feasible

4. Does adequate area exist within the right-of-way to place a Delaware Filter(s)? ☐Yes ☐No
   If Yes, continue to Design Elements sections. 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 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 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 this Treatment BMP into the project. ☐Complete

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

   If yes, contact the Regional/District NPDES Storm Water Coordinator to determine if standing water in this treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another treatment BMP.

   If a Delaware Filter is still under consideration, continue to the Design Elements – Delaware Filter section.

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? * ☒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

Design Elements – Delaware 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 between 40 and 48 hours, typically 40-hrs? * ☐Yes ☐No
2. Is access for Maintenance vehicles provided to the Delaware Filter? * ☐Yes ☐No
3. Is a bypass/overflow provided for storms > WQV? ** ☐Yes ☐No
4. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? ** ☐Yes ☐No
5. Is maximum depth ≤ 13 ft below ground surface? * ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 9

Prepared by: Huitt-Zollars Date: 12/21/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

MCTT (Multi-chambered Treatment Train)

Feasibility

1. Is the proposed location for the MCTT located to serve a "critical source area" (i.e. vehicle service facility, parking area, paved storage area, or fueling station)? ☐Yes ☒No

2. Is the WQV ≥ 4,346 ft³ [0.1 acre-foot]? ☒Yes ☐No

3. Is there sufficient hydraulic head (typically ≥ 6 feet) to operate the device? ☒Yes ☐No

4. Would a permanent pool of water be allowed by the local vector control agency? Confirm that check valves and vector proof lid as shown on standard detail sheets be allowed. ☐Yes ☒No

   If No to any question above, then an MCTT is not feasible.

5. Does adequate area exist within the right-of-way to place an MCTT(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 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

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

   If yes, contact the Regional/District NPDES Storm Water Coordinator to determine if standing water in this treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another treatment BMP.

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. Is the maximum depth of the 3rd chamber ≤ 13 ft below ground surface and has Maintenance accepted this depth? * ☐Yes ☐No
2. Is the drawdown time in the 3rd chamber between 24 and 48 hours, typically designed for 24-hrs? * ☐Yes ☐No
3. Is access for Maintenance vehicles provided to all chambers of the MCTT? * ☐Yes ☐No
4. Is there sufficient hydraulic head to operate the device? * ☐Yes ☐No
5. Has a bypass/overflow been provided for storms > WQV? * ☐Yes ☐No
6. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? ** ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 10

Prepared by: Huitt-Zollars Date: 12/21/2010 District-Co-Route: 07-LA-101

PM: 31.9/32.3 Project ID (or EA): 242300 RWQCB: Los Angeles

Wet Basin

Feasibility

1. Is the volume of the Wet Basin above the permanent pool equal to at least the WQV using a 24 to 96 hour drawdown (40 to 48 hour drawdown preferred)? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet] and the permanent pool must be at least 3x the WQV.) ☒Yes ☐No

2. Is a permanent source of water available in sufficient quantities to maintain the permanent pool for the Wet Basin? ☒Yes ☐No

3. Is proposed site in a location where naturally occurring wetlands do not exist? ☒Yes ☐No

Answer either question 4 or question 5:

4. For Wet Basins with a proposed invert above the seasonally high groundwater, Are NRCS Hydrologic Soil Groups [HSG] C and D at the proposed invert elevation, or can an impermeable liner be used? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

5. For Wet Basins with a proposed invert below the groundwater table: Can written approval from the local Regional Water Quality Control Board be obtained to place the Wet Basin in direct hydraulic connectivity to the groundwater? ☐Yes ☐No

6. Is freeboard provided ≥ 1 foot? ☒Yes ☐No

7. Is the maximum impoundment volume < 14.75 acre-feet? ☒Yes ☐No

8. Would a permanent pool of water be allowed by the local vector control agency? ☐Yes ☒No

   If No to any question above, then a Wet Basin is not feasible.

9. Is the maximum basin width ≤ 49 ft as suggested in Section B.10.2? ☐Yes ☐No

   If No, consult with the local vector control agency and District Maintenance.

10. Does adequate area exist within the right-of-way to place a Wet Basin? ☐Yes ☐No
    If Yes, continue to Design Elements sections.

    If No, continue to Question 11.

11. 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 Design Elements section.

    If No, continue to Question 12.

12. Have the appropriate state and federal regulatory agencies been contacted to discuss location and potential to attract and harbor sensitive or endangered species? ☐Yes ☐No

    If No, contact the Regional/District NPDES Coordinator

13. 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

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

    If yes, contact the Regional/District NPDES Storm Water Coordinator to determine if standing water in this treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another treatment BMP.

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.

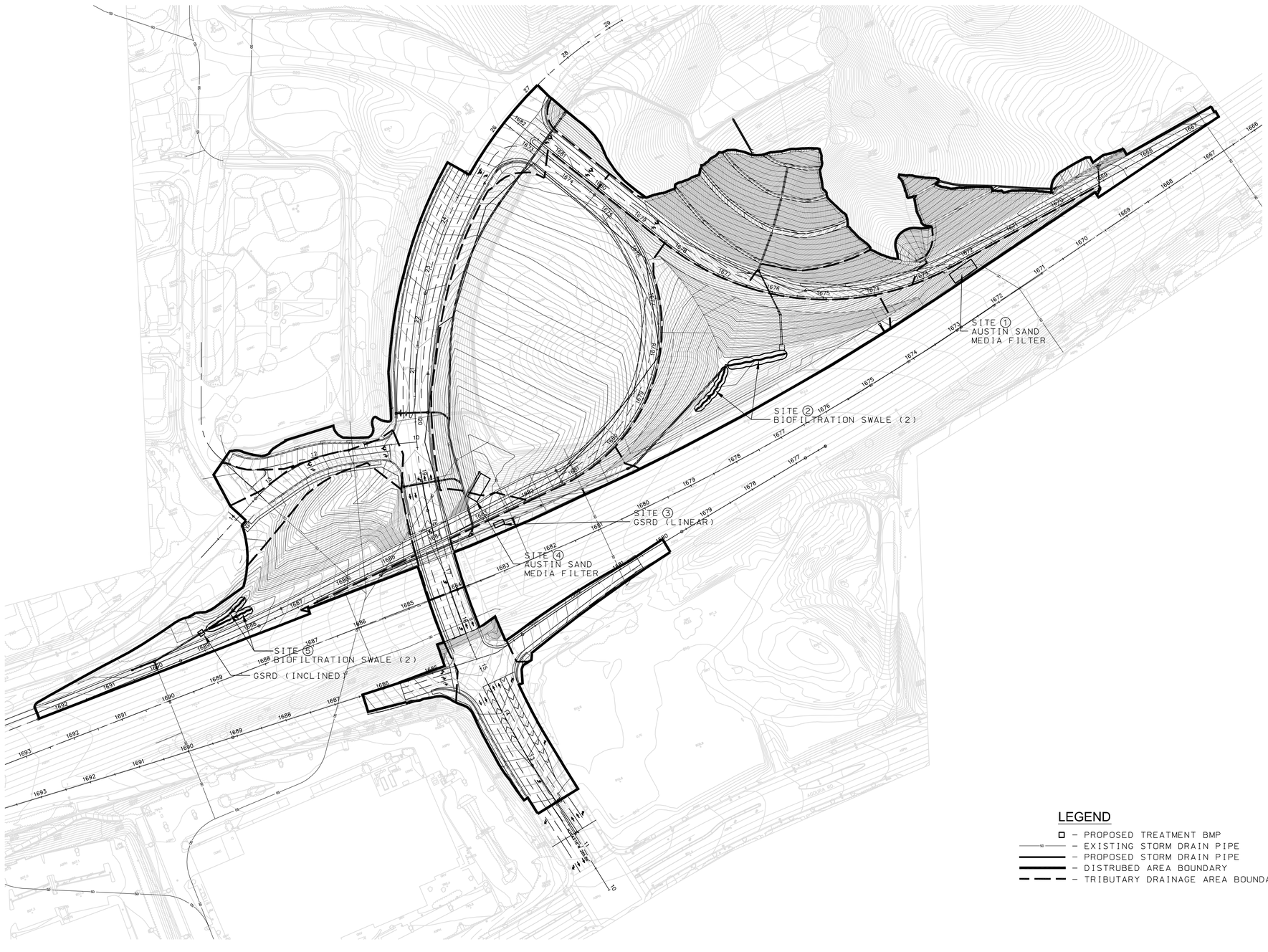
1. Can a controlled outlet and an overflow structure be designed for storm events larger than the Water Quality event? * ☐Yes ☐No
2. Is access for Maintenance vehicles provided? * ☐Yes ☐No
3. Is the drawdown time for the WQV between 24 and 96 hours? * ☐Yes ☐No
4. Has appropriate vegetation been selected for each hydrologic zone? * ☐Yes ☐No
5. Can all design elements required by the local vector control agency be incorporated? * ☐Yes ☐No
6. Has a minimum flow path length-to-width ration of at least 2:1 been provided? ** ☐Yes ☐No
7. Has an upstream bypass been provided for storms > WQV? ** ☐Yes ☐No
8. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation, or a forebay)? ** ☐Yes ☐No
9. Can public access be restricted using a fence if proposed at locations accessible on foot by the public? ** ☐Yes ☐No
10. Is the maximum depth < 10 ft?" ☐Yes ☐No

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
07	LA	101	31.9/32.3		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



LEGEND

- PROPOSED TREATMENT BMP
- EXISTING STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE
- DISTRUBED AREA BOUNDARY
- TRIBUTARY DRAINAGE AREA BOUNDARY

SCALE: 1"=100'

BMP IMPLEMENTATION PLAN

PREPARED BY:
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Huitt-Zollars, Inc. Westlake
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Westlake Village, California 91361
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REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

Caltrans

FOR REDUCED PLANS ORIGINAL SCALE IS IN FEET 0 20 40 60 80

CU EA