Dist-County-Route: 04-ALA-880, 04-ALA-260
Post Mile Limits: PM 30.47/31.61, & PM R0.78/R1.90
Type of Work: Roadway Improvements
Project ID (EA): (04-0G360)
Program Identification:
Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): San Francisco Bay (2)
Total Disturbed Soil Area: 6.14 acres PCTA: Not applicable
Alternative Compliance (acres): TBD in PS&E ATA 2 (50% Rule)? Yes ☐ No ☒
Estimated Const. Start Date: July 2024 Estimated Const. Completion Date: Jun 2027
Risk Level: RL 1 ☒ RL 2 ☐ RL 3 ☐ WPCP ☐ Other:
Is MWELO applicable? Yes ☐ No ☐ TBD in PS&E
Is the Project within a TMDL watershed? Yes ☒ No ☐
TMDL Compliance Units (acres): TBD in PS&E
Notification of ADL reuse (if yes, provide date): Yes ☐ Date: TBD in PS&E No ☐

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

Analette Ochoa — *4/17/2020*
Analette Ochoa, P.E., Registered Project Engineer — Date

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

Michael Nguyen — 5/5/20
Michael Nguyen, Project Manager — *Date*

Amrinder Singh — 05/05/20
Markus Lansdowne, Designated Maintenance Representative — *Date*

Alex Mcdonald — 5-5-2020
Alex McDonald, Designated Landscape Architect Representative — *Date*

Wilfung Martono Wilfung Martono for — 05/05/2020
Norman Gonsalves, District/Regional Design SW Coordinator or Designee — *Date*

[Stamp Required at PS&E only]

STORMWATER DATA INFORMATION

1. Project Description

The proposed project (Project) is located in the cities of Oakland and Alameda in Alameda County, California. The Project proposes to improve access along Interstate (I-) 880 and in and around the Tubes, downtown Oakland, and the City of Alameda. Within the approximately 1-mile-long project, I-880 (Post Mile [PM] ALA 30.47 to PM 31.61) and State Route (SR) 260 (PM ALA R0.78 to R1.90) are major transportation corridors. Also, the I-880 freeway viaduct is a physical barrier, limiting bicycle and pedestrian connectivity between downtown Oakland and Chinatown to the north and the Jack London District and Oakland Estuary to the south. Existing local street patterns across I-880 are intertwined with on- and off-ramps and the Tubes connecting Oakland and Alameda affecting the cross-freeway circulation of motorists, bicyclists, and pedestrians.

No-Build Alternative

Under the No-Build Alternative, there would be no improvements to bicycle or pedestrian connectivity or safety. Freeway traffic to/from the cities of Oakland and Alameda would continue to use city streets through Oakland and Chinatown, which are areas with a high volume of pedestrian activity. Vehicle-pedestrian or -bicycle conflicts from traffic traveling through city streets would continue. The I-880 viaduct would continue to impede connectivity between downtown Oakland and the Jack London District, and access would not be improved for bicycles and pedestrians traveling between Oakland and Alameda.

Build Alternative

Under the Build Alternative, Caltrans and ACTC propose to remove and modify the existing freeway ramps and to modify the Posey Tube exit in Oakland. The Build Alternative would improve access to northbound (NB) and southbound (SB) I-880 from the Posey Tube via a right turn-only lane from the Posey Tube to 5th Street and a new horseshoe connector at Jackson Street below the I-880 viaduct that would connect to the existing NB I-880/Jackson Street on ramp. The existing WB I-980/Jackson Street off ramp would be reconstructed and shifted to the south.

The Webster Tube entrance at 5th Street and Broadway would be shifted to the east to create more space for trucks to make the turn from Broadway into the Webster Tube. A bulb-out would be constructed to extend the sidewalk, reducing the crossing distance and allowing improved visibility of pedestrians on the southeast corner.

The NB I-880/Broadway off-ramp would be removed and the NB I-880/Oak Street off-ramp to 6th Street would be widened. The NB I-880/Oak Street intersection would become the main NB I-880 off-ramp to downtown Oakland and to Alameda. 6th Street would become a one-way through street from Oak Street to Harrison Street and a two-way street from Harrison Street to Broadway.

The proposed Project would include the addition of a Class IV two-way cycle track on 6th Street between Oak and Washington streets and on Oak Street between 3rd and 9th streets. Bicycle and pedestrian improvements would be constructed at the Tubes' approaches in Oakland and Alameda, and the Webster Tube westside walkway would be opened to pedestrians. This would improve connectivity to existing and future planned bicycle paths in the City of Oakland and implement various "complete streets" improvements to create additional opportunities for non-motorized vehicles and pedestrians to cross under I-880 between downtown Oakland, the Jack London

District, and Alameda. See the Required Attachments for the proposed elements of the Build Alternative.

Additional details on the Build Alternative improvements:

1. **Construction of a new horseshoe connector under I-880 at Jackson Street.**

   Vehicles exiting the Posey Tube would have direct access to NB I-880 via the proposed horseshoe connector. Vehicles heading to NB and SB I 880 would use the right-turn-only lane at the Posey Tube exit to turn onto eastbound 5th Street. Access to a new horseshoe connector would be provided from the left side of 5th Street and would loop below the I 880 viaduct to connect to the existing NB I 880/Jackson Street on-ramp. Traffic heading to SB I 880 would continue eastbound on 5th Street to the SB I-880/Oak Street on-ramp.

   Construction of the new right-turn-only lane onto 5th Street would require new retaining walls along the right side of the Posey Tube exit replacing the historic Posey Tube wall. The horseshoe connector would provide a direct route between the Posey Tube and NB I-880/ EB I-980 and SB I-880, substantially improving connectivity and minimizing the need for freeway-bound vehicles to travel through Chinatown to access the ramps. This configuration would also reduce intersection and bicycle-pedestrian conflicts.

   Posey Tube traffic heading to Chinatown and downtown Oakland would remain in the left lane and continue onto Harrison Street or turn left onto 6th Street to reach downtown via Broadway. A new left-turn pocket to accommodate the turn onto 6th Street would be constructed requiring removal of a section of the historic Posey Tube western exit wall.

2. **Reconstruction of the existing WB I-980/Jackson Street off-ramp.**

   To provide space for unimpeded movement from the Posey Tube to the new horseshoe connector, the WB I-980/Jackson Street off-ramp would be realigned to the south. The realigned off-ramp would touch down at grade on 5th Street at the Alice Street intersection. Off-ramp and 5th Street traffic would continue to be separated by a landscaped median past the condominium building at 428 Alice Street. 5th Street would be converted to a two-way street to accommodate condominium residents allowing vehicles to turn left or right onto 5th Street.

3. **Removal of the existing NB I-880/Broadway off-ramp viaduct structure, including the bridge deck and supporting columns.**

   Removing the NB I-880/Broadway off-ramp structure would provide the space for complete street improvements on 6th Street. It would also restore an element of the City of Oakland's street grid system by providing a continuous 6th Street between Oak Street and Broadway. This would provide for a more efficient street network, and it would allow traffic to be more evenly distributed on Oakland city streets. Also, it would improve traffic operations at the Broadway/6th Street and Broadway/5th Street intersections by eliminating the stream of traffic exiting the Broadway off-ramp and heading to the Webster Tube entrance. Instead, this traffic would use 6th Street and turn left at Webster Street to access the Webster Tube.

4. **Widening of the NB I-880/Oak Street off-ramp.**

   The existing Oak Street off-ramp would be widened from a one- to a two-lane exit by restriping the NB I-880 mainline and reconfiguring the ramp terminus. At the Oak Street intersection, the ramp would be further widened from one left-turn-only pocket lane, one through and left-turn lane, and one through and right-turn lane to provide one left-turn-only (SB) pocket lane, one through westbound (WB) lane, one through (WB) and right-turn (NB) lane, and one right-turn-only (NB) lane. Two new retaining walls would be constructed along the widened ramp's new edge of the shoulder. In advance of the Oak Street exit, NB I 880 would be restriped from four to five lanes, including a standard 1,400-foot-long auxiliary lane to accommodate the additional traffic resulting from the Broadway off-ramp removal.

5. **Modification of the 5th Street/Broadway access to the Webster Tube.**

   The 5th Street/Broadway entrance to the Webster Tube would be moved slightly east. Also, the 5th Street crosswalk on the east side of Broadway would be shifted east and considerably shortened, and the signal phasing would be modified to include a pedestrian-led signal phase for eastbound pedestrian traffic. This would improve safety by giving pedestrians priority over turning traffic. Also, this would improve truck access to the Webster Tube and minimize conflicts with other vehicular traffic.

6. **Construction of a new through 6th Street connecting Oak Street to Broadway.**

   Improvements to 6th Street would be accomplished by turning the street into a one-way street in the westbound direction from Oak Street to Harrison Street and a two-way street from Harrison Street to Broadway. The lanes would be a minimum of 11 feet wide. There would be a minimum of two through lanes with additional turn pockets at intersections in the westbound direction. There would be one lane in the eastbound direction from Harrison Street to Broadway.

   A new sidewalk would be constructed along the south side between Broadway and Oak Street. Segments of the existing sidewalk along the north side between Oak Street and Broadway would be reconstructed to a minimum of 10 feet wide between Harrison and Alice streets to provide continuity for pedestrians. A continuous Class IV two-way cycle track would also be provided between Oak and Washington streets. Parking spaces would be provided along portions of this roadway.

7. **Construction of a two-way bicycle/pedestrian path and walkway way from Webster Street in Alameda to 6th Street in Oakland through the Posey Tube and from 4th Street in Oakland through the Webster Tube to Mariner Square Loop in Alameda.**

   The path would begin at Webster Street and Constitution Way in Alameda, would continue through the Posey Tube on the existing eastside walkway, and would exit the Tube via a new ramp with a hairpin turn at 5th Street. The path in Alameda connecting to the Posey Tube would be realigned and widened. The path in Oakland would wrap around the back of the Portal building on 4th Street and continue onto Harrison Street. It would continue onto a Class I two-way bicycle/pedestrian path under I-880 just west of Harrison Street and connect to the Class IV two-way cycle track on 6th Street between Oak and Washington streets. The new bicycle and pedestrian ramp exit from the Posey Tube would require removal of the existing historic Posey Tube staircase to provide street level Americans with Disabilities Act (ADA)-compliant access from the Tube.

The proposed Project would improve access between Oakland and Alameda by opening the Webster Tube maintenance walkway to bicycle and pedestrian travel. The walkway would connect to the proposed path under I-880 at 4th Street (near the Posey Tube Portal building). It would continue onto 4th Street to Webster Street, and it would turn north through the existing parking lot on the west side of the Webster Tube entrance before making a hairpin turn to connect to the westside walkway inside the Tube.

On the Alameda side, the path would connect to existing bicycle and pedestrian facilities at Mariner Square Loop and Willie Stargell Avenue. The existing sidewalk within Neptune Park would be widened to match the proposed sidewalk to the north. Improvements inside the Tube would include widening the existing walkway, upgrading the existing railings, and relocating call boxes and fire extinguishers.

8. **Modification of 5th, 7th, Madison, Jackson, Harrison, Webster, Oak, and Franklin streets.**

   The street modifications would include replacing the dual right turns at the 7th Street/ Harrison Street intersection with a single right-turn-only lane and removing the free right turn (where the island allows cars to turn right without stopping) at the 7th Street/ Jackson Street intersection. These would no longer be needed because Alameda traffic bound for NB/SB I 880 would be better served by the right turns from the Posey Tube to 5th Street. With the removal of the free right turns, vehicles would observe the traffic signal before turning right. With the curb extension proposed at this location, the pedestrian crossing distance would be shortened, which would decrease vehicle-pedestrian conflicts. In addition, a HAWK beacon would be installed on 7th Street across the street from the Chinese Garden Park. There would also be restrictive right-turn movements to reduce bicycle and vehicle conflicts at the 5th/Broadway, 6th/Webster, 6th/Harrison, 6th/Jackson, 6th/Madison, 5th/Jackson, 8th/Oak, and 7th/Oak intersections.

   A continuous sidewalk would be installed along the perimeter of Chinese Garden Park. Additional improvements, including landscaping modifications, could occur adjacent to the southern boundary of the park and would be coordinated through the City of Oakland.

   Jackson Street between 5th and 6th streets would be converted from two- to one-way travel lanes in the northbound direction, and it would provide an emergency-only access lane.

Retaining Walls and Excavation

The proposed improvements would include construction of several new retaining walls along the NB I-880 Jackson Street on-ramp, WB I-980 Jackson Street off-ramp, NB I-880 Oak Street off-ramp, and new horseshoe connector. Retaining wall construction would minimize the need for right-of-way (ROW) acquisition. Table 1 lists the retaining walls needed for the proposed Project including their locations and approximate dimensions. Table 2 lists the excavation depths of other proposed Project features.

Table 1. Retaining Wall Locations and Dimensions (Oakland)

Wall Number	Location	Approx. Length (feet)	Height (feet)	Maximum Excavation Depth (feet)
1	Supporting Harrison Street as Posey Tube right lane runs onto 5th Street	215	8-12	36
2	Supporting existing fill in front of the existing abutment at Harrison Street	65	8-30	13
3	Supporting the I-880 mainline	410	24-32	28
4	Supporting the Jackson Street abutment	145	17	2
4A	Supporting the Jackson Street abutment	60	10	20
4B	Supporting the Jackson Street abutment	60	14	20
5	Supporting cut slope south of 6th Street and parallel to existing NB I-880 Broadway off-ramp	510	4-22	44
6	Supporting Posey Tube bicycle/pedestrian switchback on the exit's east side	105	10	32
7	Supporting along the NB I-880 Oak Street off-ramp to accommodate an additional left-turn pocket	215	4-10	6
8R	Supporting reconstruction of the WB I-980 Jackson Street off-ramp (north wall)	230	24	32
8L	Supporting reconstruction of the WB I-980 Jackson Street off-ramp (south wall)	225	22	6
9	Supporting additional left-turn pocket for traffic from the Posey Tube at Harrison Street and 6th Street intersection	95	8	12
10	Supporting NB I-880 Oak Street off-ramp widening	399	12	4

Table 2. Excavation Depths

Feature	Description	Excavation Depth (feet)
OAKLAND		
Bike Path	Assumed pavement depth = 0.5' PCC, 0.5' CL 2 aggregate base (AB)	1
Roadway	Assumed pavement depth =0.75' hot mix asphalt (HMA) (type A), 0.75' class 2 AB, 1' class 2 aggregate subbase (AS)	2.5
WB I-980 Jackson Street Off-ramp	New bents (columns) and an abutment	50
ALAMEDA		
Bike Path	Assumed pavement depth = 0.5' PCC, 0.5' class 2 AB	1
Roadway	Assumed pavement depth =0.75' HMA (type A), 0.75' class 2 AB, 1' class 2 AS	2.5
Overhead Sign Foundation	Truss single-post Type V with assumed span length = 32'	20

Construction Schedule

Construction activities would last approximately 36 months. Construction is expected to begin in mid-2023. There would be two major stages with several phases in each. The first stage would include construction of the Jackson Street horseshoe and associated improvements on the southside of I-880 as well as the widening of the walkway in the Webster Tube. The second stage would include widening of the NB I-880/Oak Street off-ramp, removak the Broadway NB I-880 off-ramp, and construct 6th Street improvements with associated elements on the northside of I-880.

Construction equipment would be staged in areas underneath I-880 that are owned by Caltrans and currently leased as parking lots. Construction activities would be completed during the day; however, nighttime work would be needed to minimize impacts to traffic, especially in the Webster Tube. Caltrans would continue to coordinate with the cities of Oakland and Alameda to develop and implement a Transportation Management Plan (TMP) and other measures to minimize construction impacts on the human and natural environment. As part of the TMP, a shuttle may be needed to transport bicyclists and pedestrians between Oakland and Alameda during construction.

The proposed Project contains a number of standardized Project measures which are employed on most, if not all, Caltrans projects. They were not developed in response to any specific environmental impacts resulting from the proposed Project.

Disturbed Soil Area (DSA) and Impervious Area

Table 3 summarizes the disturbed soil area (DSA) of the Build Alternative, and Table 4 summarizes the acreage of impervious surface improvements. The total DSA was estimated from the proposed areas of grading, plus the added, replaced, and removed impervious areas. The added impervious area minus the removed impervious area is the net new impervious area (NNI). The new impervious surface (NIS) is the sum of the NNI and the replaced impervious surface (RIS).

The Project's Project Initiation Document (PID) phase was approved in March 2011. Therefore, the Project within Caltrans' ROW is grandfathered under the *National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from the State Of California, Department Of Transportation (Caltrans) Properties, Facilities, and Activities* (Order No. 99-06-DWQ); this Project is exempt from stormwater treatment requirements under this Permit because the NNI is less than one acre.

The Project within the cities of Oakland and Alameda, and the Special District[1], are not required to provide stormwater treatment because the Project would not add additional travel lanes within these jurisdictions.

Table 3. DSA

Right-of-Way	Disturbed Soil Area (acre)
Caltrans	2.96
City of Oakland	2.93
City of Alameda	0.21
Special District	0.04
Total	6.14

[1] Special District is the Peralta Community College District. Modifications are proposed at the Laney College parking lot north of the Oak St off-ramp.

Table 4. Impervious Surface Improvements

Right-of-Way	Added Impervious Area	Removed Impervious Area	Net New Impervious Area	Replaced Impervious Area	New Impervious Surface
Caltrans	0.86 acre	0.02 acre	0.84 acre	2.09 acres	2.93 acres
City of Oakland	0.04 acre	0.01 acre	0.03 acre	2.89 acres	2.92 acres
City of Alameda	0.09 acre	0.00 acre	0.09 acre	0.13 acre	0.22 acre
Special District	0.00 acres	0.04 acres	-0.04 acres	0.00 acres	-0.04 acres
Total	0.99 acre	0.07 acre	0.92 acre	5.11 acres	6.03 acres

2. Site Data and Stormwater Quality Design Issues

The Project site is located entirely within Caltrans District 4 and the San Francisco Bay Regional Water Quality Control Board (RWQCB), Region 2.

Hydrologic Watershed

The Caltrans Water Quality Planning Tool places the study area entirely within the undefined hydrologic sub-area #204.20 of the East Bay Cities hydrologic area, South Bay hydrologic unit, and San Francisco Bay hydrologic region.

Receiving Water Bodies

Runoff from the Project site flows into the local drainage system, which eventually discharges into Lake Merritt Channel and Oakland Estuary within the Oakland Project limits and Oakland Estuary within the Alameda Project limits. Lake Merritt Channel is considered to be a potential Waters of the United States (U.S.) and a Waters of the State. While this jurisdictional Water of the US is located in the Project Location, the only work proposed near Lake Merritt Channel is roadway striping on I-880 over the channel so no impacts are anticipated. According to the 2014/2016 California 303(d) List of Water Quality Limited Segments, the Oakland Estuary (classified as Central San Francisco Bay 303(d) list) is listed as a 303(d) waterbody with a Total Maximum Daily Load (TMDL) for mercury. Additional pollutants on the 303(d)-list impacting this section of the bay include: chlordane, DDT, dieldrin, dioxin compounds (including 2,3,7,8-TCDD), furan compounds, invasive species, polychlorinated biphenyls (PCB), PCBs (dioxin-like), selenium, and trash. The San Francisco Bay RWQCB Basin Plan (2017) lists both Oakland Estuary and Lake Merritt Channel as having beneficial uses which are listed in Table 5.

Table 5. Beneficial Uses

Beneficial Use	Lake Merritt Channel	Oakland Estuary
Industrial Service Supply		X
Industrial Process Supply		X
Commercial and Sport Fishing	X	X
Shellfish Harvesting		X
Estuary Habitat	X	X
Fish Migration		X
Preservation of Rare and Endangered Species		X
Fish Spawning		X
Wildlife Habitat	X	X
Water Contact Recreation	X	X
Noncontact Water Recreation	X	X
Navigation		X

Source: San Francisco Bay RWQCB 2017

Climate

According to the Köppen climate classification system, the Project location has a Mediterranean climate, characterized by hot, dry summers and mild, moist winters (George 2015). The Project location generally experiences precipitation between mid-October and mid-April. A climate summary for the nearest National Oceanic and Atmospheric Administration (NOAA) weather station with similar elevation and topography to the Project is at the Oakland International Airport (OAK), which reports the following precipitation and temperature information (Western Regional Climate Center 2015).

- Average annual rainfall for Oakland is 18.27 inches
- Average minimum and maximum temperatures are 41.4 and 73.5° F

Soil Classification

Boring tests were also conducted, which revealed on the Oakland side of the Project, Merritt sand is present in the upper 24 inches of the Project location (Parsons Brinckerhoff 2001). Merritt sand is a fine-grained (Silty-sandy texture sand), very well sorted, well drained, eolian, sand deposit (Graymer 2000). On the Alameda portion of the Project, soil types classified from the Geotechnical information

log of test borings include sands and clayey soils within the upper 24 inches of the soil profile (Parsons Brinckerhoff 2001). The sandy soils found on the Alameda portion of the Project location representative of Holocene and Pleistocene dune sand present at the extreme southern margin of the Alameda portion of the Project location (Graymer 2000).

Groundwater

Boring logs for a past project, EA 04-399974, taken on the Oakland side near the tunnel entrances found that groundwater ranges from 7 to 26 feet below ground surface. According to data from the Caltrans Geotracker tool, groundwater monitoring wells within 0.2 miles south of the Alameda side of the Project have groundwater levels that range from 3.34 to 7.13 feet below ground level. On the Oakland side, Geotracker showed a greater range in groundwater levels, with the inland site ranging from 12.11 to 20.44 feet below ground level and more coastal sites ranging as high as 4.34 to 7.90 feet below the ground.

The groundwater in the Santa Clara Valley – East Bay Plain has multiple beneficial uses according to the regional waterboard:

- Municipal and domestic water supply
- Industrial process water supply
- Industrial service water supply
- Agricultural water supply

RWQCB Special Requirements/Concerns

Within Caltrans' ROW, this Project is subject to Provision E.6 "Region Specific Requirements" of the current Caltrans NPDES Permit. Under this provision, projects within the San Francisco Bay RWQCB jurisdiction must meet trash-load-reduction requirements of the San Francisco Bay. According to the Significant Trash Generation Areas (STGAs) Map for Alameda County (Caltrans 2018), this Project along I-880 is within an area of moderate trash generation. Therefore, gross solids removal devices (GSRDs) and other approved trash capture devices would be considered along I-880 within the Project area.

The Project within the cities of Oakland and Alameda and the Special District would also consider trash capture devices to comply with the trash reduction requirements of the San Francisco Bay Municipal Regional Permit (MRP), Order No. R2-2015-0049.

The STGAs Map is included in the Supplemental Attachments, and further information about the GSRDs and other trash capture devices is discussed in the Treatment BMP Strategy section in Section 6 of this report.

Hazardous Waste

The current and historic existence of businesses associated with hazardous material contamination in the Oakland area means that there is a potential for contaminated groundwater. According to the 2004 Groundwater Bulletin 118, there are 13 locations in the East Bay Plain Subbasin with areas of major groundwater contamination. Most of these polluted sites occurred due to the release of fuels and solvents, and appear to be restricted to the upper 50 feet of the subsurface. In particular, the I-880 Corridor has been used by motor vehicles since the 1930s, which means surface soils have likely been affected by aerially-deposited lead (ADL). According to the Project's Initial Site

Assessment (Parikh Consultants Inc. 2019), industrial and commercial activities in Downtown Oakland have led to a risk for soil and groundwater contamination, including a plume of petroleum hydrocarbons and volatile organic compounds (VOC) near the intersection of Harrison and 7th streets. A subsurface and hazardous waste investigation will be completed during the PS&E phase.

Topography

The Oakland Project location is on the southern slope of the knoll that holds Downtown Oakland. In addition to the sloped knoll, the Project site is also located on some flatter terrain near Oakland Estuary and San Francisco Bay. The elevation at the Oakland Study area varies from sea level to about 35 feet (United States Geological Survey 2001).

The main topographic feature on Alameda Island is a ridgeline that runs down the middle of the island in the northwest-southeast direction (Schaaf and Wheeler 2008). The study area is located on the northerly side of the ridgeline, where terrain gently slopes toward the Oakland Estuary. The elevations in this study area range from near sea level to about 13 feet (United States Geological Survey 2001).

The very flat portions of the study area near sea level were reclaimed from historic tidal marshlands. These areas include land adjacent to the Lake Merritt Channel, the northern portion of the Alameda study area, and the western margin of the Oakland study area (Sowers 2010).

Measures for Avoiding or Reducing Potential Stormwater Impacts

As this Project is proposing work along the existing I-880 alignment and the Posey and Webster Tubes, the Project cannot be relocated or realigned to avoid or reduce impacts to receiving water bodies.

The Project would have a DSA of more than 1 acre and would add a net total of 0.92 acre of impervious surface area; therefore, the Project would have the potential to cause stormwater impacts to Oakland Estuary and Lake Merritt Channel.

The Project site is relatively flat and is not anticipated to require slope work. Any slope work that does occur would be planned to be less than 2:1 (H:V) compacted as specified in the Caltrans Standard Specifications, and stabilized using permanent erosion control measures to be specified during the PS&E phase.

Measures will be employed to prevent any construction materials from entering the receiving water bodies. Concentrated flows will be collected into stabilized drains and channels/directed to existing drainage.

Where feasible, placement of BMPs will be done in a manner that will allow for maintenance access. Side slopes will be specified to be as flat as possible, for ease of maintenance.

Existing Treatment BMPs

There are two existing altered Austin Vault Sand Filters (AVSF) and one existing biofiltration swale in the vicinity of the Project. The two AVSF sites are located along the I-880 at PM ALA 30.52 and PM ALA 30.41. The biofiltration swale is located on the southeast side of I-880 at PM ALA 30.092. Work near the AVSFs and biofiltration swale is limited to restriping, this work is not anticipated to impact the AVSF's. The Project plans avoid impacts to all existing BMPs.

3. Construction Site BMPs to be used on Project

This section presents the temporary construction site BMP strategy to be considered for this Project to meet both current Caltrans criteria and the requirements presented in the Construction General Permit (CGP).

Risk Level Determination

Using the U.S. Environmental Protection Agency (EPA) Rainfall Erosivity Factor Calculator for Small Construction Sites, it was determined that the Project will have an erosivity factor value (R) of 158 for both the Oakland and Alameda sides.

The Project location has two different K factor values, which were found using the Caltrans Water Quality Planning Tool. The Oakland location has a K factor value of 0.37, and the Alameda location has a K factor value of 0.15. The Alameda Project location has a low K value, meaning that erosion is less likely occur. The Oakland Project location has a moderate K value, which means erosion is more likely to occur.

The Caltrans Water Quality Planning Tool identifies the length-slope (LS) factor as 0.25 in Oakland and 0.2 in Alameda for the Project location.

The product of these values is 14.6 (158 x 0.37 x 0.25) on the Oakland side, and 4.7 (158 x 0.15 x 0.2) on the Alameda side; because these values are less than 15, the Project has a low sediment risk.

The water bodies were determined to be low risk water bodies because neither of them has TMDLs' for sediment or beneficial uses of cold-water habitat, fish spawning, and fish migration.

The low receiving water and low sediment risks result in the Project being classified as having a risk level of 1.

Construction Site BMP Strategy

This Project will need to undergo dewatering due to the high-water levels at the Project locations in Oakland and Alameda. Dewatering procedures will follow the *Field Guide to Construction Site Dewatering*. If the Project location contains potentially contaminated groundwater or groundwater that may release contaminated plumes when disturbed, a dewatering permit would be obtained prior to the start of construction. The dewatering permit that would be most applicable is the RWQCB's General Waste Discharge Requirements for Discharge or Reclamation of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by VOCs, Fuel Leaks, Fuel Additives, and Other Related Wastes (VOC and Fuel General Permit) (NPDES No. CAG912002, RWQCB Order No. R-2012-0012). An active treatment system may also be necessary to treat contaminated groundwater exposed during excavation activities.

At this phase of the Project, the Preliminary Project Cost estimate provides lump sum estimates to prepare the Stormwater Pollution Prevention Plan (SWPPP) ($5,000), job site management ($75,000), and temporary water pollution control items ($200,000). Evaluation of the specific BMPs necessary for this Project to comply with the CGP would be detailed during the PS&E phase. Furthermore, the contractor would be required to detail actual in-field implementation of the BMPs in the SWPPP during construction; the contractor would also be required to amend the SWPPP as necessary to match both field conditions and Project phasing.

4. Maintenance BMPs

It is anticipated that there may be drain inlets needing stenciling. Drain inlets within Caltrans' ROW will be done in accordance with Caltrans Standard Plans. Drain inlets within the City of Oakland's ROW will be done in accordance with City of Oakland's Standard Details. Drain inlets in the City of Alameda would conform to Alameda County standards. Special provisions, plans, and costs associated with stenciling drainage inlets will be provided in the Contract Documents during the PS&E phase.

5. Other Water Quality Requirements and Agreements

There are no key negotiated understandings or agreements with the San Francisco Bay RWQCB pertaining to this Project. A Section 401 Water Quality Certification, Section 404 permit, and Section 1602 permit are not expected to be required for this Project.

6. Permanent BMPs

Permanent BMPs are strategies and measures to minimize and avoid water quality impacts in the post construction condition. Permanent BMPs include design pollution prevention (DPP) and treatment BMP strategies. The Project's PID phase was approved in 2011; therefore, the Project must comply with the 1999 Caltrans NPDES permit within Caltrans' ROW. Within the cities of Oakland and Alameda and the Special District's ROW, the Project must comply with the MRP. The permanent stormwater treatment requirements, hydromodification assessment criteria, and measures to comply with these requirements within the cities of Oakland and Alameda will be based on the *C.3 Stormwater Technical Guidance* (Alameda County Clean Water Program [ACCWP] 2017). The lump sum for permanent BMPs is included in the Estimate Support Information and would be separated into individual items during the PS&E phase.

Design Pollution Prevention (DPP) BMP Strategy

Downstream Effects Related to Potentially Increased flow

A rapid stability assessment is not required within Caltrans' ROW under the 1999 Caltrans NPDES. Based on the Hydromodification Management Plan (HMP) Susceptibility Map provided in the *C.3 Stormwater Technical Guidance*, the Project is contained within the tidally influenced/depositional areas and areas not included in the HMP within the cities' ROWs. Mapping from the Alameda County Clean Water Program's (ACCWP's) *Hydromodification Susceptibility Map Application* (2010) that identifies areas susceptible and not susceptible to hydromodification is included in the Supplemental Attachments. Therefore, the Project is exempt from hydromodification requirements. This assessment and additional information about susceptibility of the outfalls are discussed in the Project's *Drainage Study and Preliminary Hydromodification Report* (WRECO 2019).

The increase of impervious surface from the pre-Project condition could result in an increase to velocity, volume, or sediment load of downstream flows. Any increase will be minimized through the implementation and dispersion of runoff. The implementation of erosion control measures along slopes and disturbed soils will also achieve permanent stabilization and vegetation establishment.

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

The Project will be constructed to minimize erosion by disturbing slopes only when necessary, by minimizing cut and fill areas to reduce slope lengths, and by providing concentrated flow conveyance

systems consisting of storm drains, ditches, and gutters. Cut and fill slopes will be constructed to be less than 2:1 (H:V) or match existing slope steepness. The areas of cut and fill will be developed during the PS&E phase.

According to the District 4 Work Plan (Caltrans 2017), no areas prone to erosion have been identified within the Project limits. Replacement landscaping and vegetation for slope stabilization would be placed wherever existing landscaping is disturbed. Because the project area is predominantly urban and paved with unpaved areas likely being landscaped in post-Project condition, minimum erosion control measures are anticipated to be necessary. These efforts could include the use of a mixture of hydroseed, hydromulch, compost, and straw. Rolled erosion control products can be considered where there is the potential for increased erosion. The need for hard-surface erosion control measures will be determined during the PS&E phase and will likely include rock slope protection, energy dissipation devices at culvert outlets, and possible vegetation-control lining. Further information on vegetated surfaces, including the need for a Model Water Efficient Landscape Ordinance worksheet, would receive concurrence from the Caltrans District 4 Landscape Architect and be provided in the PS&E phase.

A lump sum cost of $20,000 is proposed for erosion control because there is minimum anticipated need for erosion control measures for this Project. The individual line item costs and final costs for erosion control measures will be determined in the PS&E phase.

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

The Project is located in an urbanized area where the vast majority of surface area is already paved, thus a substantial increase in flow concentration is not anticipated as a result of the Project. Sheet flow will be promoted to the extent practicable to minimize concentrated flows and promote flow over vegetated surfaces. Every effort will be made to minimize and prevent channelizing, gullying, or scouring of the surrounding slopes. Velocity dissipation devices and flared end sections or headwalls at culvert inlets and outlets will be considered if/where necessary to prevent erosion. Types and details of the proposed drainage facilities will be developed during the PS&E phase. Risks due to erosion, overtopping, flow backups, or washout will also be further evaluated during the PS&E phase of the Project.

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

Existing mature vegetation and landscaping will be protected in place where possible. Areas of clearing and grubbing will be limited to those areas impacted by new construction. Studies to determine environmentally sensitive areas were conducted during the environmental phase. The findings of these studies are recorded in the Project's *Natural Environment Study* (NES) and *Aquatic Resources Delineation Report* (ARDR) (WRECO 2019). Details of the areas to be preserved will be shown in the Project plans to be developed during the PS&E phase

Treatment BMP Strategy

The Project within Caltrans' ROW is not required to consider implementation of treatment BMPs under the 1999 Caltrans NPDES because the NNI is less than one acre. However, as a best practice to minimize potential stormwater impacts, at this phase, the Project considers the potential for providing stormwater treatment equal to the NNI, which is 0.92 acres, or to the maximum extent practicable (MEP). The Project is not required to implement permanent stormwater treatment measures within the cities of Oakland and Alameda and Special District ROWs under the MRP, because the proposed Project roadway widening does not include addition of one or more travel lanes.

Dry-weather flow diversion and traction sand traps are not considered for this Project. Traction sand is not regularly applied to roadways within the Project area. Delaware filters, multi-chambered treatment trains, and wet basins are not considered for this Project due to vector concerns within District 4. In addition to the Caltrans-approved treatment BMPs, the San Francisco Bay RWQCB has stated to Caltrans District 4 that permanent stormwater treatment within areas covered under the MRP should be provided through the use of retention type and trash capture devices. Treatment devices to be considered for this Project include biofiltration devices designed for bioretention, tree-planting areas, and trash capture devices.

Caltrans has an approved list of treatment BMPs that have been studied and verified to remove targeted design constituents and provide general pollutant removal. All treatment BMPs would be installed with impermeable liners to reduce the impacts of potentially contaminated groundwater. The use of bioretention type devices allows for pollutant removal or reduction while promoting the effort to mimic predevelopment hydrology by reducing flow rates and velocities.

Based on a preliminary identification of types and locations of permanent stormwater treatment BMPs, the Project would treat 0.18 acres of impervious area within Caltrans' ROW. The primary limitations to achieving 100% treatment is the limited available ROW and the existing urban environment where there is limited undeveloped, unpaved, or open space to place treatment BMPs or where rerouting of existing drainage facilities is necessary, which would result in increased DSA and impervious surface improvements, which could potentially more water quality impacts.

The treatment BMP areas would be refined during the PS&E phase and coordinated with the District 4 Stormwater Coordinator. Treatment calculations, types, and final sizing and locations of BMPs would be determined during the PS&E phase. Proposed treatment BMPs were calculated to be equal to 4% of the receiving tributary watershed area; the treatment locations are listed in Table 6. These BMPs are shown on the Conceptual Treatment Watershed Maps included in the Supplemental Attachments. These values would be updated during the PS&E phase based on the final sizing and locations.

Table 6. Treatment BMP Summary Table

ID	BEG Sta	END Sta	BMP Type	Impervious Tributary Area (acres)	BMP Area (acres)
TBMP-1	"B1" 133+66.31	"B1" 134+19.03	Bioretention / Tree-Planting Area	0.08	0.003
TBMP-2	"5TH" 134+30.03	"5TH" 134+42.83	Bioretention / Tree-Planting Area	0.04	0.002
TBMP-3	"5TH" 135+9.90	"5TH" 135+32.11	Biofiltration/ Bioretention Area	0.06	0.003
			Total	0.18	

The Project estimate currently provides a total lump sum cost of $206,000 for treatment BMPs. Individual line item costs will be finalized in the PS&E phase.

Infiltration Devices, Checklist T-1, Parts 1 and 2

Infiltration devices may not be feasible for the Project area, because the majority of the Project is either paved or are composed of Hydrologic Soil Groups C or D which have slow to very slow infiltration rates. The existing soils can be amended or engineered soil media can be used to increase the infiltration potential of proposed treatment BMPs. The design feasibility of infiltration devices will be further evaluated during the PS&E phase once detailed infiltration studies have been conducted and appropriate soil amendments or engineered soil mixes are developed.

Bioretention/Tree-Planting Devices, Checklist T-1, Parts 1 and 3

Biofiltration/Bioretention devices were considered in interchange area(s) and off-shoulder pervious areas along I-880 within Caltrans' ROW, where site conditions allowing for the establishment of vegetation and the adequate area existing within the ROW would permit for their implementation. Biofiltration/Bioretention devices promote vegetation growth which contributes to the evapotranspiration of water. Retention can be achieved through the use an engineered soil mix and an underdrain system. Retention may be limited due to potential groundwater contamination. The District 4 Hazardous Waste Office would confirm if retention is allowed for the Project.

Tree well filters are considered to be placed near curbs and gutters along sidewalks, where site conditions allow for the placement and adequate drainage of Project runoff to the BMPs. Tree well filters would receive downstream flows through these locations to ensure stormwater treatment. Conceptual BMP locations are shown in the Supplemental Attachments. Detailed design calculations to size the biofiltration/bioretention devices and determination of final locations would be completed during the PS&E phase.

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

Detention devices are not feasible for this Project due to a lack of impervious area.

GSRDs and Other Trash Capture Devices, Checklist T-1, Parts 1 and 7

Caltrans' ROW within the Project limits has been identified to be within a moderate STGA. To comply with the San Francisco Bay RWQCB Cease and Desist Order (CDO) on trash reduction, trash capture devices will need to be implemented within Caltrans' ROW.

During the PS&E phase, trash capture locations and its associated devices will be identified.

A cursory review of the planning level design drawings was performed to evaluate the feasibility of installing Caltrans-approved trash capture devices (linear radial GSRD and end-of-pipe trash nets). Based on this review, Caltrans-approved GSRDs were determined to be infeasible at this phase of this Project because of limited available ROW, minimal available open areas for placement of a vault structure, and utility constraints for below surface structures. Caltrans-approved end of pipe trash nets were also determined to be infeasible due to the urban environment of the Project area. There are no culvert outfalls, ditches, or conveyances not identified as Waters of the U.S./Waters of the State within the Project area where the trash nets can be installed.

Due to these constraints, the design team will coordinate with the Caltrans District 4 Office of Water Quality during the PS&E phase to identify other approved Caltrans District 4 trash capture devices that can be considered within the Project area to achieve the trash reduction requirements.

All trash capture devices should be sized for the 1-year, 1-hour peak storm event and designed to avoid flooding risks along the travel way. All trash capture devices should also be designed in tandem with other treatment BMPs that achieve stormwater treatment through infiltration, harvest, and re-use or evapotranspiration methods as required under the current Caltrans NPDES Permit.

To comply with trash reduction requirements within the cities of Oakland and Alameda and the Special District, trash capture inserts are proposed for drainage inlets within the local ROWs.

The Project estimate provides a total lump sum cost of $590,000 for trash capture measures. This lump sum considers the cost of trash capture devices implemented in both Caltrans' ROW and local ROW. The cost associated with Caltrans' ROW is an estimated $100,000. Within local ROW, 49 drainage inlets have been identified as potential trash capture inlets; based on an estimated $10,000 per trash inlet, the estimated cost for trash capture within in local ROW is $490,000.

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

Austin sand filters are not feasible for this Project due to a lack of impervious area.

DPP Infiltration Areas, Checklist T-1, Parts 1 and 11

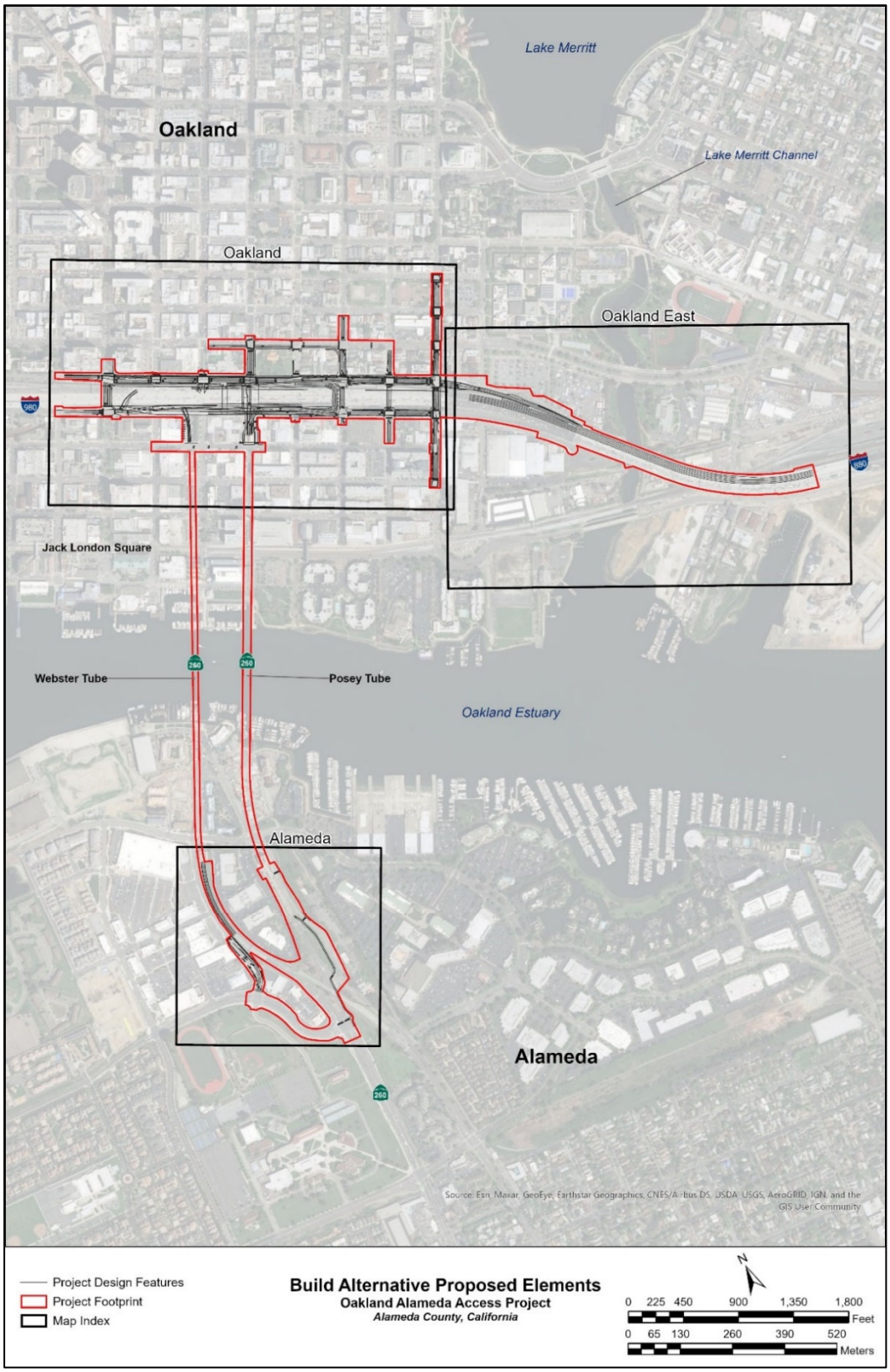
DPP infiltration areas are not considered, because typical biofiltration devices or other approved treatment BMPs will be implemented and considered over the use of DPP infiltration areas. The Project is also not expected to generate alternative compliance or TMDL compliance units.

Required Attachments

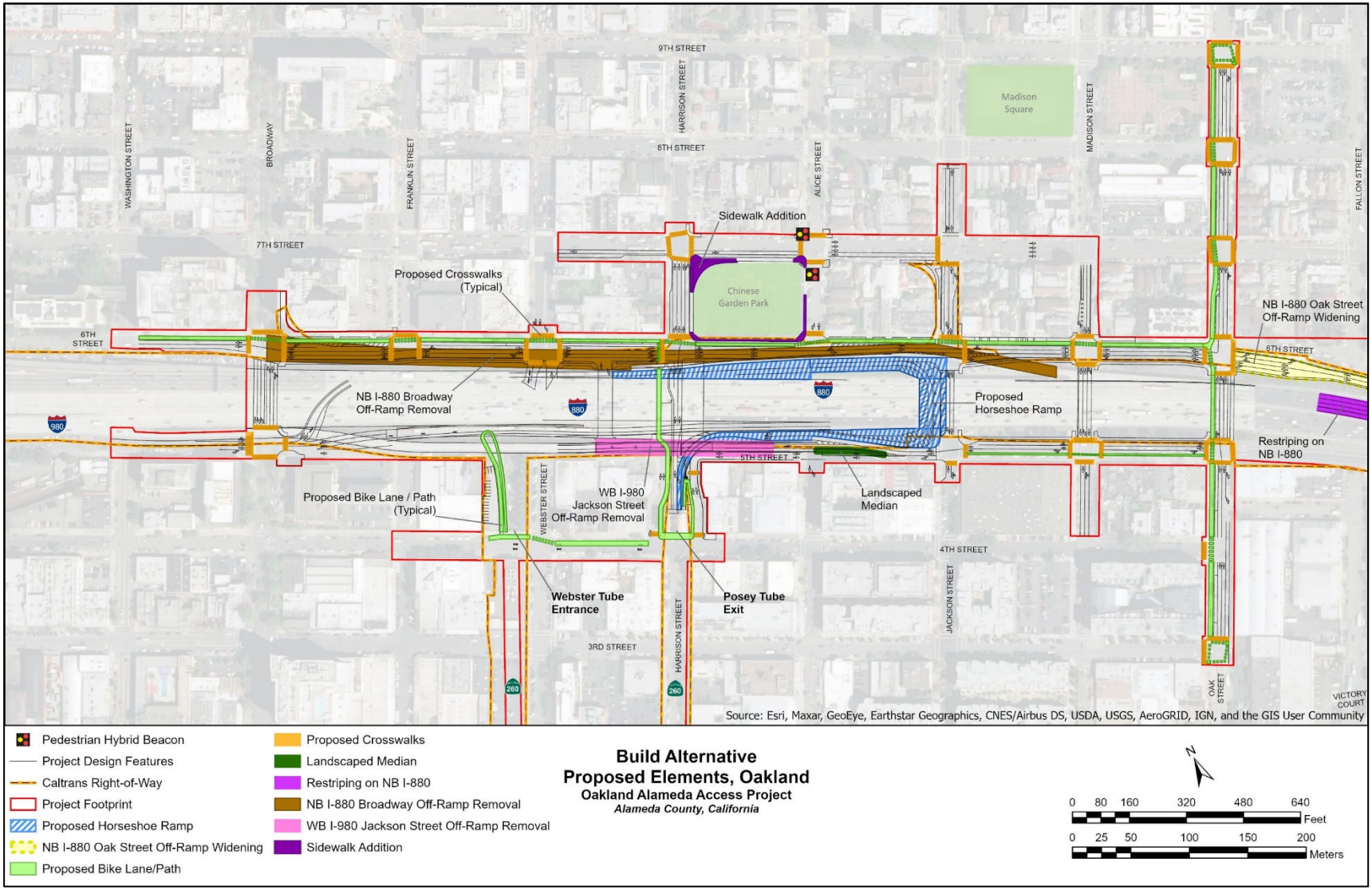
- Build Alternative Proposed Elements Maps
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation

Supplemental Attachments

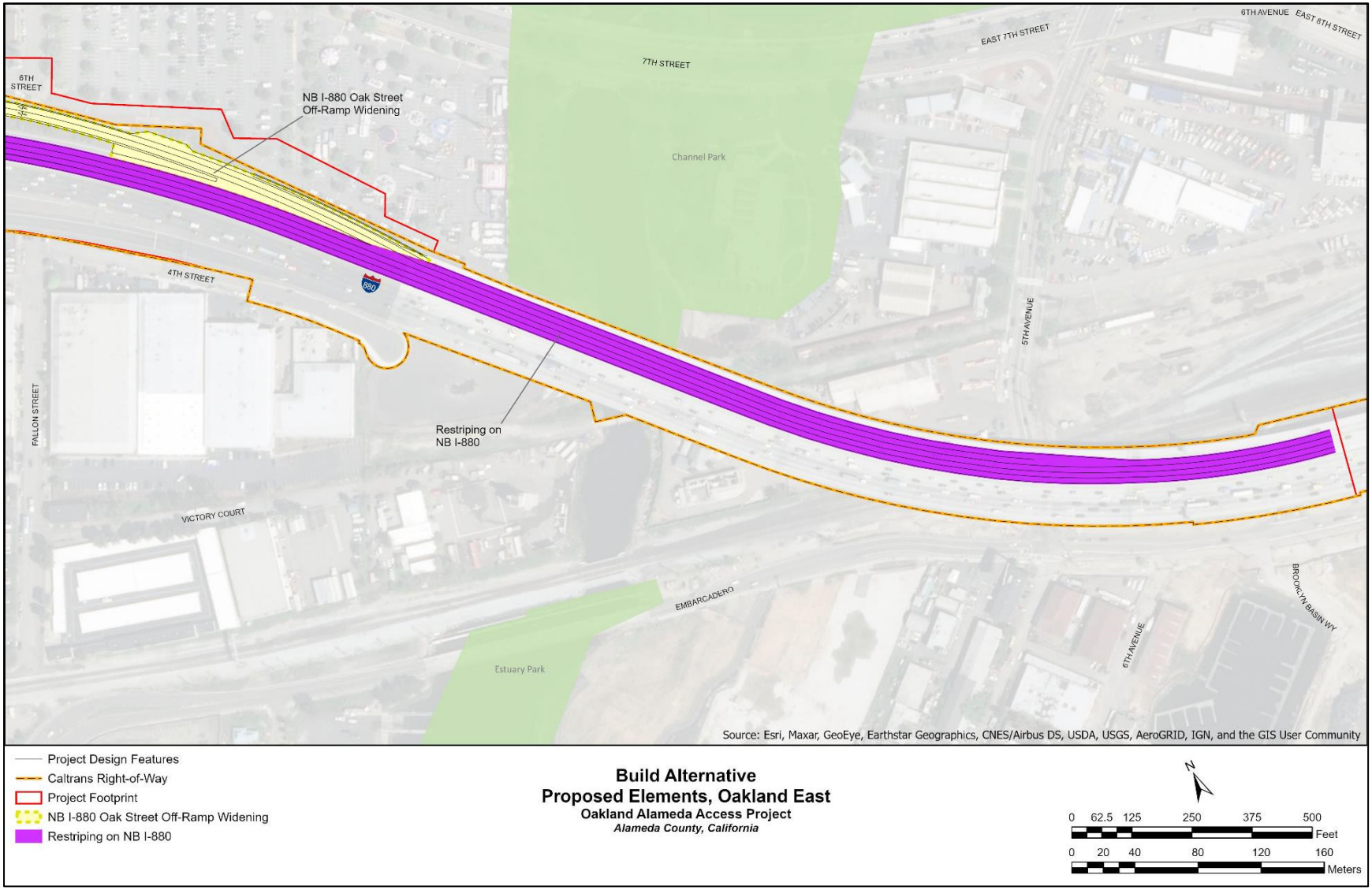
- Checklist SW-1, Site Data Sources
- Checklist T-1, Part 1 (Treatment BMPs)
- Estimate Support Information for Construction Site, DPP, and/or Treatment BMPs
- Checklist SW-2, Stormwater Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Stormwater Impacts
- Checklist DPP-1, Parts 1–5 (Design Pollution Prevention BMPs)
- Checklist T-1, Part 2-4, 7-8, and 11 (Treatment BMPs)
- Construction Site BMP Consideration Form
- Checklist CS-1, Parts 1–6
- STGAs Map of Alameda County
- Plans showing BMP deployment


Lake Merritt
Oakland
Lake Merritt Channel
Oakland
Oakland East
Jack London Square
Webster Tube
Posey Tube
Oakland Estuary
Alameda
Alameda
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Project Design Features
Project Footprint
Map Index
Build Alternative Proposed Elements
Oakland Alameda Access Project
Alameda County, California
N
0 225 450 900 1,350 1,800
Feet
0 65 130 260 390 520
Meters

Source: HNTB


9TH STREET
6TH STREET
7TH STREET
5TH STREET
4TH STREET
3RD STREET
WASHINGTON STREET
BROADWAY
FRANKLIN STREET
HARRISON STREET
ALICE STREET
MADISON STREET
FALLON STREET
WEBSTER STREET
JACKSON STREET
OAK STREET
VICTORY COURT
Madison Square
Chinese Garden Park
Sidewalk Addition
Proposed Crosswalks (Typical)
NB I-880 Broadway Off-Ramp Removal
NB I-880 Oak Street Off-Ramp Widening
Proposed Horseshoe Ramp
Restriping on NB I-880
Proposed Bike Lane / Path (Typical)
WB I-980 Jackson Street Off-Ramp Removal
Landscaped Median
Webster Tube Entrance
Posey Tube Exit
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Pedestrian Hybrid Beacon
Project Design Features
Caltrans Right-of-Way
Project Footprint
Proposed Horseshoe Ramp
NB I-880 Oak Street Off-Ramp Widening
Proposed Bike Lane/Path
Proposed Crosswalks
Landscaped Median
Restriping on NB I-880
NB I-880 Broadway Off-Ramp Removal
WB I-980 Jackson Street Off-Ramp Removal
Sidewalk Addition
Build Alternative
Proposed Elements, Oakland
Oakland Alameda Access Project
Alameda County, California
N
0 80 160 320 480 640
Feet
0 25 50 100 150 200
Meters

Source: HNTB


6TH AVENUE
EAST 6TH STREET
EAST 7TH STREET
7TH STREET
6TH STREET
NB I-880 Oak Street
Off-Ramp Widening
Channel Park
4TH STREET
880
5TH AVENUE
FALLON STREET
Restriping on
NB I-880
VICTORY COURT
EMBARCADERO
BROOKLYN BASIN WY
6TH AVENUE
Estuary Park
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Project Design Features
Caltrans Right-of-Way
Project Footprint
NB I-880 Oak Street Off-Ramp Widening
Restriping on NB I-880
Build Alternative
Proposed Elements, Oakland East
Oakland Alameda Access Project
Alameda County, California
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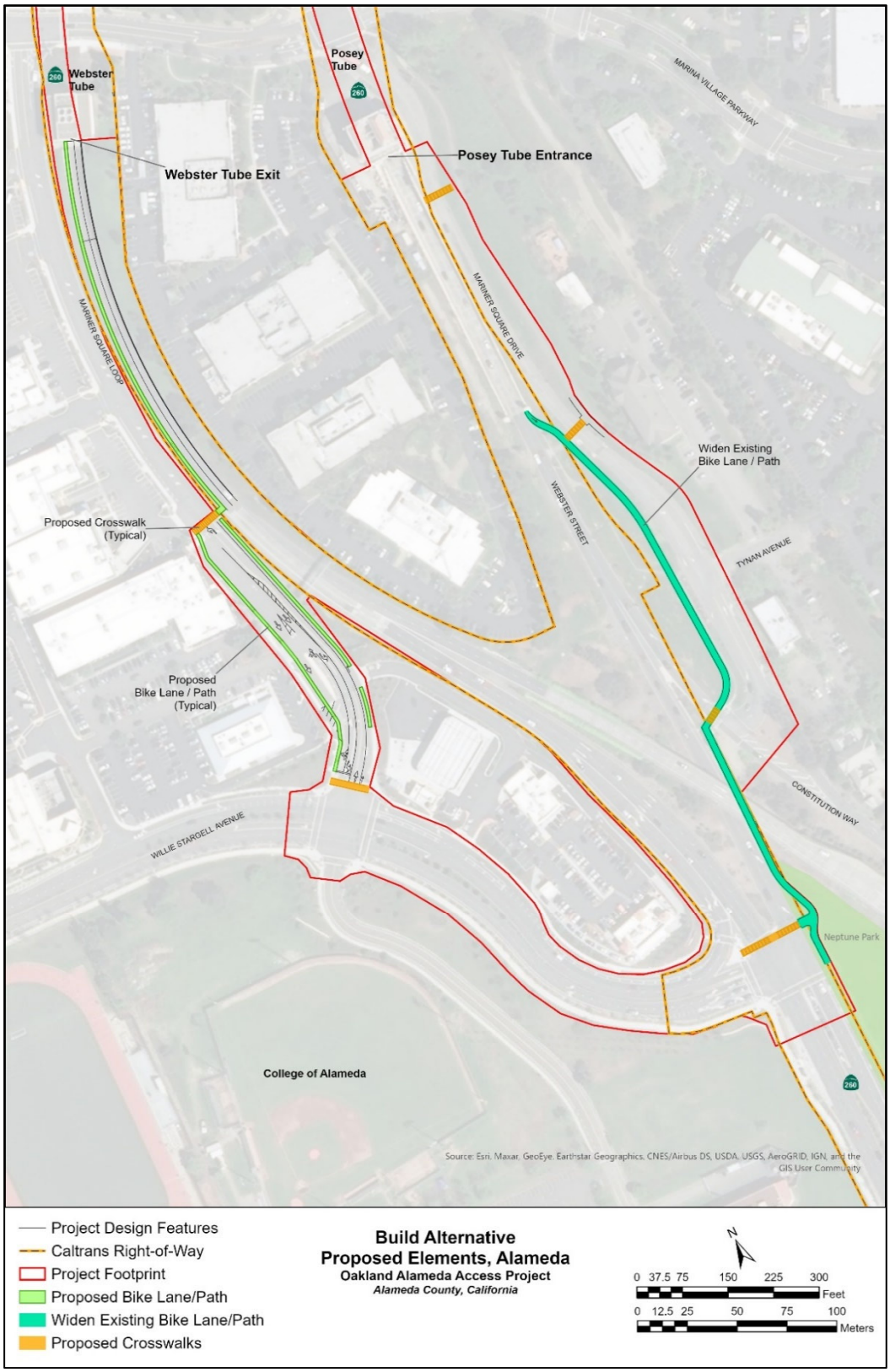
Feet
0 20 40 80 120 160
Meters

Source: HNTB


Webster Tube
Posey Tube
Webster Tube Exit
Posey Tube Entrance
MARINA VILLAGE PARKWAY
MARINER SQUARE LOOP
MARINER SQUARE DRIVE
WEBSTER STREET
Widen Existing Bike Lane / Path
Proposed Crosswalk (Typical)
TYNAN AVENUE
Proposed Bike Lane / Path (Typical)
CONSTITUTION WAY
WILLIE STARGELL AVENUE
Neptune Park
College of Alameda
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Project Design Features
Caltrans Right-of-Way
Project Footprint
Proposed Bike Lane/Path
Widen Existing Bike Lane/Path
Proposed Crosswalks
Build Alternative
Proposed Elements, Alameda
Oakland Alameda Access Project
Alameda County, California
N
0 37.5 75 150 225 300
Feet
0 12.5 25 50 75 100
Meters

Source: HNTB

DATE: May 2020

Project ID (EA): (04-0G360)

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

*Project's PID phase was completed in March 2011, so project is grandfathered under the Caltrans 1999 NPDES Permit (Order No. 99-06-DWQ). Under this permit, the project is exempt from requiring treatment BMPs because the NNI is less than one acre.

R Factor

Facility Information

Start Date: 07/01/2024	**Latitude:** 37.7920
End Date: 06/30/2027	**Longitude:** -122.2754

Calculation Results

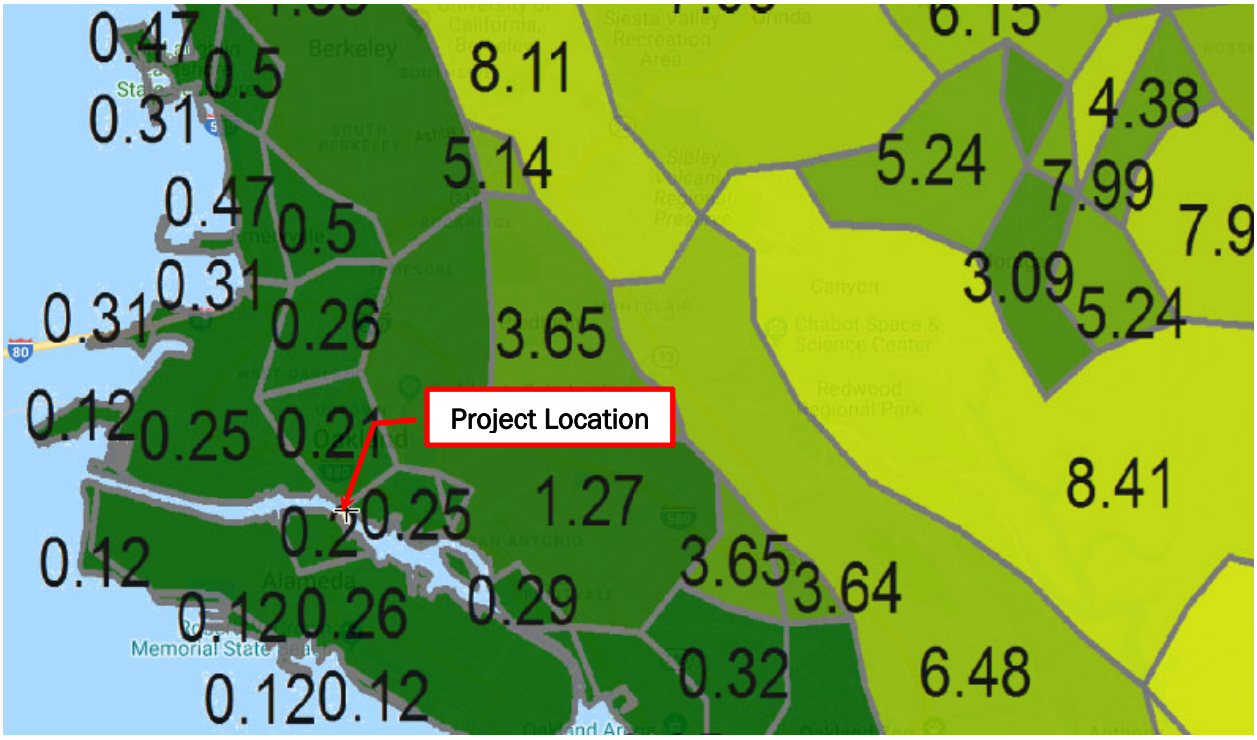
Rainfall erosivity factor (R Factor) = **158**

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

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

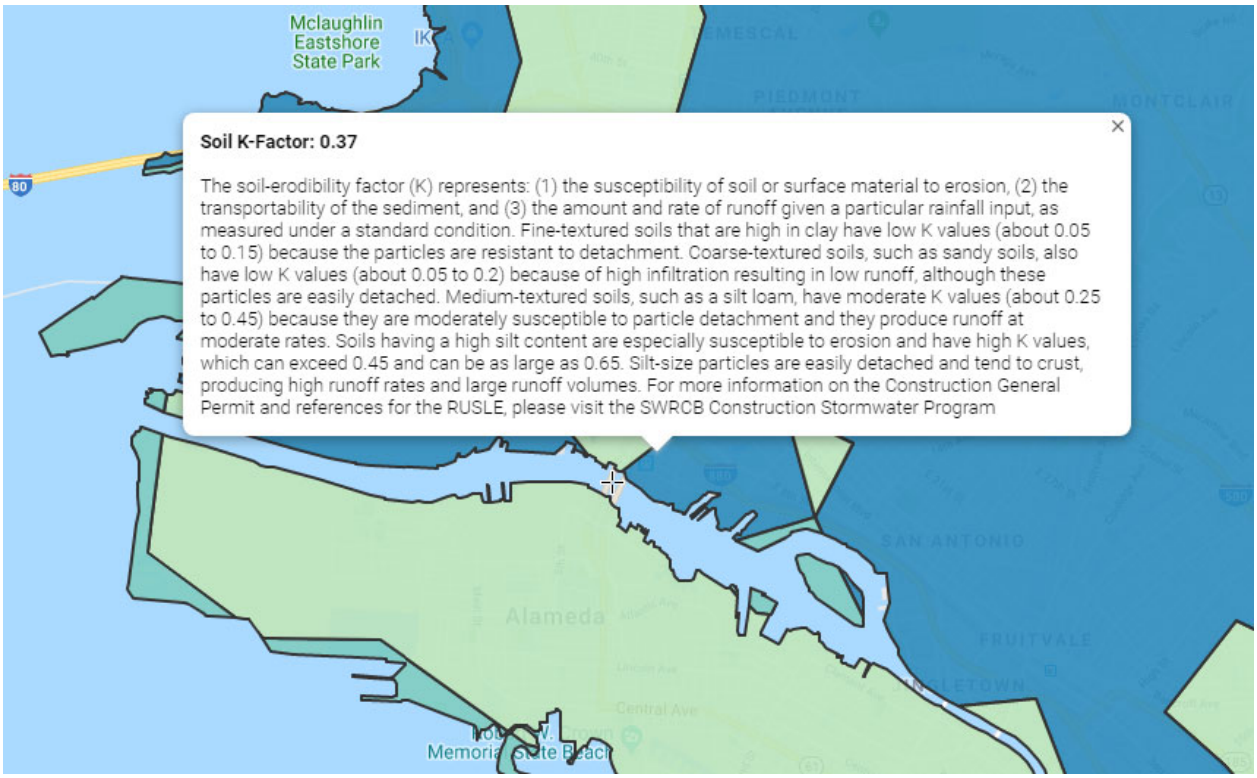
Source: US EPA

LS Factor

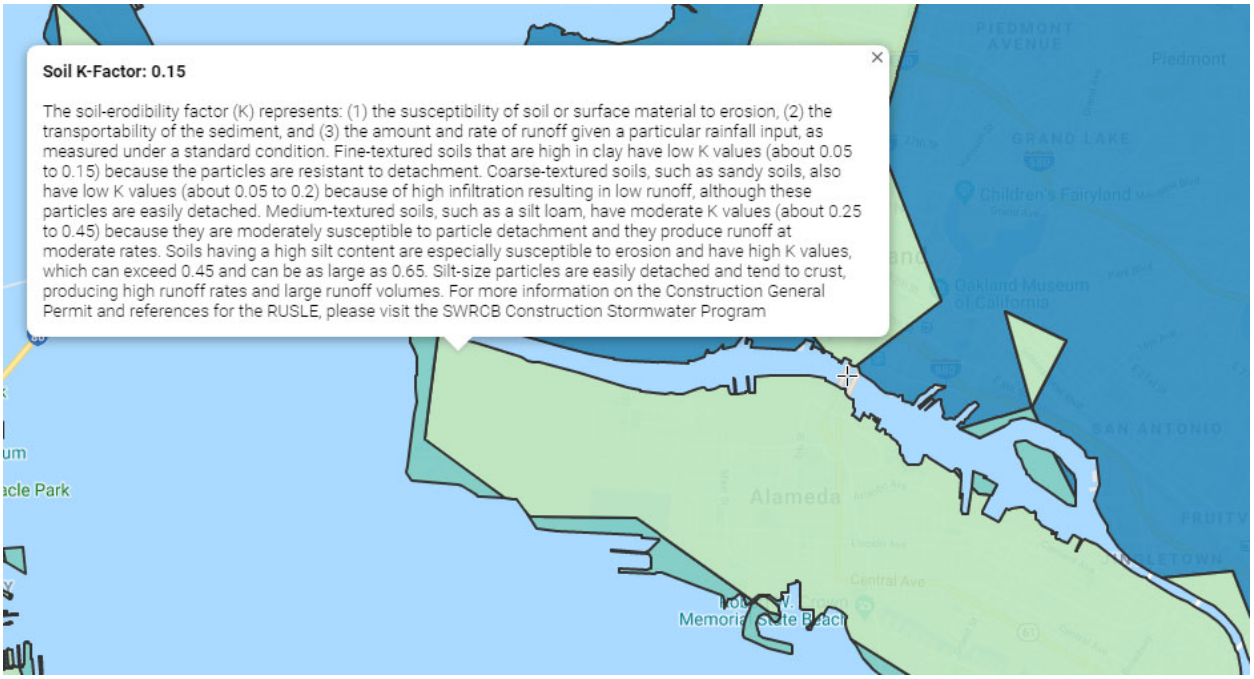


Source: Caltrans

K Factor – Oakland Side



K Factor – Alameda Side



Source: Caltrans

Oakland Side

Sediment Risk Factor Worksheet	Entry
A) R Factor	
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. http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	158
B) K Factor (weighted average, by area, for all site soils)	
The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted. Site-specific K factor guidance	
K Factor Value	0.37
C) LS Factor (weighted average, by area, for all slopes)	
The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction. LS Table	
LS Factor Value	0.25
Watershed Erosion Estimate (=RxKxLS) in tons/acre	14.6
Site Sediment Risk Factor Low Sediment Risk: < 15 tons/acre Medium Sediment Risk: >=15 and <75 tons/acre High Sediment Risk: >= 75 tons/acre	**Low**

Alameda Side

Sediment Risk Factor Worksheet	Entry
A) R Factor	
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. http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm	
R Factor Value	158
B) K Factor (weighted average, by area, for all site soils)	
The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted. Site-specific K factor guidance	
K Factor Value	0.15
C) LS Factor (weighted average, by area, for all slopes)	
The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction. LS Table	
LS Factor Value	0.2
Watershed Erosion Estimate (=RxKxLS) in tons/acre	4.7
Site Sediment Risk Factor Low Sediment Risk: < 15 tons/acre Medium Sediment Risk: >=15 and <75 tons/acre High Sediment Risk: >= 75 tons/acre	**Low**

Oakland and Alameda Side

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 visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	**No**	**Low**
OR		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml		

Combined Risk Level Matrix

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

Project Sediment Risk: Low

Project RW Risk: Low

Project Combined Risk: Level 1

Checklist SW-1, Site Data Sources

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

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

DATA CATEGORY/SOURCES	Date
Water Quality	
• Caltrans Water Quality Planning tool http://svctenvims.dot.ca.gov/wqpt/wqpt.aspx	Last accessed: October 2019
• Caltrans. 2018 District 4 Significant Trash Generation Areas Map for Alameda County.	2018
• California Water Board. GAMA Groundwater Information System. <https://geotracker.waterboards.ca.gov/gama/gamamap/public/>	Last accessed: October 2019
Geotechnical	
• *Geotechnical Information Log of Test Borings,* EA 04-440141, September 17 2001	Last accessed: October 2019
Topographic	
• Schaaf and Wheeler 2008, Final Report Storm Drain Master Plan Alameda, California	Last accessed: April 2018
• Sowers 2010, Creek & Watershed Map of Oakland & Berkeley	Last accessed: April 2018
• United States Geological Survey 2001	Last accessed: April 2018
Hydraulic	
• *Alameda County Clean Water Program's (ACCWP's) (2010), Hydromodification Susceptibility Map Application*	2017
• WRECO, 2019, *Drainage Study and Preliminary Hydromodification Report*	October 2019
Climatic	
• Köeppen climate classification system, George 2015	Last accessed: April 2018
• National Oceanic and Atmospheric Administration	Last accessed: April 2018
• Western Regional Climate Center 2015	Last accessed: April 2018
Other Data Categories	
• Alameda County Clean Water Program, *C.3 Stormwater Technical Guidance*	2017
• Caltrans. *Storm Water Quality Handbook, Construction Site Best Management Practices (BMPs) Manual.*	May 2017

• Caltrans. Storm Water Quality Handbooks, Project Planning and design Guide.	July 2017
• Parikh Consultants, Inc. 2019, Phase I Initial Site Assessment.	October 15, 2019

Treatment BMPs
Checklist T-1, Part 1

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Consideration of Treatment BMPs

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

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

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

Identify the overall project PCTA

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

PCTA = NNI + RIS + ATA (1 Impervious) + ATA (2)

NNI = Net New Impervious Area

RIS = Replaced Impervious Surface

ATA (1 Impervious) = Additional Treatment Area required for existing Treatment BMPs that were removed or modified as part of the project

ATA (2) = Additional Treatment Area required when NNI is 50 percent or greater than total project impervious

What is the PCTA for the project? Not Applicable **Acres** (Stormwater treatment is considered to MEP as a best management approach)

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

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

Total Maximum Daily Load (TMDL) Retrofit Projects

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

Overall Project Evaluation

Answer all questions, unless otherwise directed.

A. Overall Project Consideration

1. Is the project in a watershed with prescriptive Treatment BMP requirements in an adopted TMDL implementation plan or are there any other requirements for project area (e.g., District, Regional Board, Lawsuit)? ☐ Yes ☒ No

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

   If No, continue.

2. Does the receiving water have a TMDL for litter/trash, or is there a region specific requirement related to trash? ☒ Yes ☐ No

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

   If No, continue.

3. Is the project located in an area that uses traction sand more than twice a year? ☐ Yes ☒ No

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

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

   If No, continue.

B. Dual Purpose Facilities

Does the project have (or propose to include) any dual purpose facilities that could meet treatment requirements (e.g., Dry Weather Flow Diversion, flood control basins, etc.)? ☐ Yes ☒ No

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

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

If No, continue.

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

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

1. Based on site conditions, do the DPP Infiltration Areas infiltrate 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) for the project? ☐ Yes ☒ No

   Yes, go to question 6 of "Individual BMP Evaluation".

   If No, account for area infiltrated and continue.

2. Can infiltration for these areas be increased by using soil amendments or other means? ☒ Yes ☐ No

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

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

   If No, continue.

Individual BMP Evaluation

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

1. Infiltration Devices (Infiltration Basin, Trench, or other device)

   a. Can 100 percent of the BMP contributing drainage area WQV (or remaining WQV, if in series with a DPP Infiltration Area or other BMP) be infiltrated? ☐ Yes ☒ No

      If Yes, go to question 6.

      If No, continue.

2. Biofiltration Devices (Biofiltration Strips and Swales)

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

      If Yes, when designing the biofiltration device, determine the percent WQV infiltrated from both the impervious and pervious BMP contributing drainage areas. Consider using existing or amended soils:

      i. If infiltration is >50 percent, continue to b.

      ii. If infiltration is ≤50 percent, go to question 3.

      If No, continue to b.

   b. Can biofiltration devices be designed to: ☐ Yes ☐ No

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

      ii. Meet the siting and design criteria of the Caltrans biofiltration device design guidance.

      If Yes, continue to c.

      If No, go to question 3.

   c. Biofiltration devices are considered to be an effective method of treatment, go to question 6.

3. Earthen type BMPs (Detention Devices, Media Filters, or other devices)

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

   If Yes, when designing the earthen type BMP, determine the percent WQV infiltrated from both the impervious and pervious BMP contributing drainage area. Consider using existing or amended soils:

      i. If infiltration is >50 percent, continue to b.

      ii. If infiltration is ≤50 percent, go to question 4.

   If No, continue to b.

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

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

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

   If Yes, continue to c.

   If No, go to question 4.

   c. Earthen type BMPs are considered to be an effective method of treatment, go to question 6.

4. Targeted Design Constituent (TDC)

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

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

      If Yes, is the identified pollutant(s) considered to be a TDC (check all that apply below)? Continue to b. ☐ Yes ☒ No

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

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

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

      If Yes, use Matrix A to select BMPs and go to question 5.

      If No, continue to c.

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

      If Yes, use Matrix B to select BMPs, and go to question 5.

      If No, continue to d.

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

      If Yes, use Matrix C to select BMPs, and go to question 5.

      If No, continue e.

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

      If yes, use Matrix D to select BMPs, and go to question 5.

      If No, continue.

[1] General metals is a designation used by Regional Water Boards when specific metals have not yet been identified as causing the impairment.

BMP Selection Matrix A: General Purpose Pollutant Removal			
Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	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	Austin filter (concrete) Delaware filter
HRT = hydraulic residence time (min) All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous			
Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	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) All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC			
Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			
*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 BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			
*In cases where earthen BMPs also infiltrate, Delaware filters are ranked in Tier 2 if the TDC is nitrogen only, but they are Tier 1 for phosphorous only or both nitrogen and phosphorous.			

5. Does the project discharge to a 303(d) receiving water that is listed for mercury or low dissolved oxygen? ☒ Yes ☐ No

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

   If No, continue to question 6.

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

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

   ____ DPP Infiltration Areas: Checklist T-1, Part 11

   ____ Infiltration Devices: Checklist T-1, Part 2

   __X_ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 3

   ____ Detention Devices: Checklist T-1, Part 4

   ____ Traction Sand Traps: Checklist T-1, Part 5

   ____ Dry Weather Diversion: Checklist T-1, Part 6

   ____ GSRDs: Checklist T-1, Part 7

   ____ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8

   Note:

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

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

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

7. Prepare cost estimate, including right-of-way, and identify any pertinent site specific determination of feasibility for selected Treatment BMPs and include in the SWDR for approval. TO BE COMPLETED DURING PS&E ☐ Complete

Individual Treatment BMP Summary Table

List the selected BMPs based on the findings of this checklist and the treated areas associated with each BMP in Table E-2. For projects with multiple BMPs, add rows (if needed), or attach a separate sheet displaying the following information. ☐ Complete

Each BMP must be tracked in Table E-2. Districts may use a modified table based upon their needs. See Section 6.6 for additional information. TO BE COMPLETED DURING PS&E

Preliminary Cost Estimate

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost		
	Biological Mitigation	LS	1	x	200,000.00	=	$	200,000		
130670	Temporary Reinforced Silt Fence	LF		x		=	$	-		
141000	Temporary High Visibility Fence	LF	10,000	x	7.00	=	$	70,000		
								Subtotal Environmental Mitigation	$	*270,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost		
20XXXX	Highway Planting	LS	1	x	98,000.00	=	$	98,000		
20XXXX	Irrigation System	LS	1	x	49,000.00	=	$	49,000		
204099	Plant Establishment Work	LS	1	x	300,000.00	=	$	300,000		
204101	Extend Plant Establishment Work	LS		x		=	$	-		
20XXXX	Follow-up Landscape Project	LS		x		=	$	-		
150685	Remove Irrigation Facility	LS		x		=	$	-		
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS		x		=	$	-		
206400	Check and Test Existing Irrigation Facilities	LS		x		=	$	-		
21011X	Imported Topsoil (X)	CY/TON		x		=	$	-		
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x		=	$	-		
200122	Weed Germination	SQYD		x		=	$	-		
208304	Water Meter	EA		x		=	$	-		
2087XX	XX" Conduit (Use for Irrigation x-overs)	LF		x		=	$	-		
20890X	Extend X" Conduit (Use for Extension of Irrigation)	LF		x		=	$	-		
								Subtotal Landscape and Irrigation	$	*447,000*

5C - EROSION CONTROL

Item code		Unit	Quantity		Unit Price ($)			Cost		
210010	Move In/Move Out (Erosion Control)	EA		x		=	$	-		
210350	Fiber Rolls	LF		x		=	$	-		
210360	Compost Sock	LF		x		=	$	-		
2102XX	Rolled Erosion Control Product (X)	SQFT		x		=	$	-		
21025X	Bonded Fiber Matrix	QFT/ACRE		x		=	$	-		
210300	Hydromulch	SQFT		x		=	$	-		
210420	Straw	SQFT		x		=	$	-		
210430	Hydroseed	SQFT		x		=	$	-		
210600	Compost	SQFT		x		=	$	-		
210630	Incorporate Materials	SQFT		x		=	$	-		
21XXXX	Erosion Control	LS	1	x	20,000.00	=	$	20,000		
								Subtotal Erosion Control	$	*20,000*

5D - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost		
130300	Prepare SWPPP	LS	1	x	5,000.00	=	$	5,000		
130200	Prepare WPCP	LS		x		=	$	-		
130100	Job Site Management	LS		x		=	$	-		
130330	Storm Water Annual Report	EA		x		=	$	-		
130310	Rain Event Action Plan (REAP)	EA		x		=	$	-		
130320	Storm Water Sampling and Analysis Day	EA		x		=	$	-		
130520	Temporary Hydraulic Mulch	SQYD		x		=	$	-		
130550	Temporary Hydroseed	SQYD		x		=	$	-		
130505	Move-In/Move-Out (Temporary Erosion Control)	EA		x		=	$	-		
130640	Temporary Fiber Roll	LF		x		=	$	-		
130900	Temporary Concrete Washout	LS		x		=	$	-		
130710	Temporary Construction Entrance	EA		x		=	$	-		
130610	Temporary Check Dam	LF		x		=	$	-		
130620	Temporary Drainage Inlet Protection	EA		x		=	$	-		
130730	Street Sweeping	LS		x		=	$	-		
130100	Job Site Management	LS	1	x	75,000.00	=	$	75,000		
XXXXXX	Temporary Water Pollution Control Items	LS	1	x	200,000.00	=	$	200,000		
XXXXXX	Full trash capture	LS	1	x	590,000.00	=	$	590,000		
XXXXXX	Storm Water Treatment BMP	LS	1	x	206,000.00	=	$	206,000		
								Subtotal NPDES	$	*1,076,000*
								TOTAL ENVIRONMENTAL	$	**1,813,000**

Supplemental Work for NPDES

066595	Water Pollution Control Maintenance Sharing*	LS		x		=	$	-		
066596	Additional Water Pollution Control**	LS		x		=	$	-		
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-		
XXXXXX	Some Item	LS		x		=	$	-		
								Subtotal Supplemental Work for NDPS	$	*-*

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

Source: HNTB

Checklist SW-2, Stormwater Quality Issues Summary

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

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

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

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

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

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

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

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☒No	☐NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☐Yes	☐No	☒NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☒Yes	☐No	☐NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☒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 stormwater pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction stormwater impacts?	☒Yes	☐No	☐NA

Design Pollution Prevention BMPs
Checklist DPP-1, Part 1

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Consideration of Design Pollution Prevention BMPs

TO BE COMPLETED DURING PS&E

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

Will the project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☐Yes	☒No	☐NA

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

Slope/Surface Protection Systems

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

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

Concentrated Flow Conveyance Systems

Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
Will cross drains be modified?	☐Yes	☒No	☐NA

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

Preservation of Existing Vegetation, Soils, and Stream Buffer Areas

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

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

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Downstream Effects Related to Potentially Increased Flow

TO BE COMPLETED DURING PS&E

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

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Slope / Surface Protection Systems

TO BE COMPLETED DURING PS&E

1.	What are the proposed areas of cut and fill? (attach plan or map)	☐Complete
2.	Were benches or terraces provided on high cut and fill slopes to shorten slope length?	☐Yes ☒No
3.	Were concentrated flows collected in stabilized drains or channels?	☒Yes ☐No
4.	Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)? If Yes, District Landscape Architect is responsible for an erosion control strategy and may prepare an erosion control plan.	☒Yes ☐No
5.	Are new or disturbed slopes > 2:1 (h:v)? If Yes, DES Geotechnical Design unit must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Stormwater Coordinator for slopes steeper than 2:1 (h:v).	☐Yes ☒No

VEGETATED SURFACES

1.	Identify existing vegetation.	☒Complete
2.	Evaluate site to determine soil types, appropriate vegetation and planting strategies.	☒Complete
3.	How long will it take for permanent vegetation to establish?	☐Complete
4.	Plan transition BMPs from construction to permanent establishment.	☐Complete
5.	Have vegetated areas and supporting permanent irrigation systems been designed to comply with the Model Water Efficient Landscape Ordinance (MWELO)?	☐Yes ☐No
6.	Minimize overland and concentrated flow depths and velocities.	☐Complete

HARD SURFACES

1.	Are hard surfaces minimized?	☒Yes ☐No
	Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems.	☐Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Concentrated Flow Conveyance Systems

TO BE COMPLETED DURING PS&E

Ditches, Berms, Dikes and Swales

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

Overside Drains

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

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☒Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 5

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Preservation of Existing Vegetation, Soils, and Stream Buffer Areas

TO BE COMPLETED DURING PS&E

1.	Review Preservation of Property, (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation, soils, and stream buffer areas.	☒Complete
2.	Has all vegetation, soils, and stream buffer areas to be retained been coordinated with Environmental, and identified and defined in the contract plans?	☐Yes ☐No
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	☒Complete
4.	Have impacts to preserved vegetation, soils, and stream buffer areas been considered while work is occurring in disturbed areas?	☐Yes ☐No
5.	Are all areas to be preserved delineated on the plans?	☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 2

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Infiltration Devices

TO BE COMPLETED DURING PS&E

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
3.	Is site located over a previously identified contaminated groundwater plume?	☐Yes	☒No
	If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.		
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☒Yes	☐No
	If "Yes", the location can only be considered if vector control has been addressed (e.g., underground).		
5.	(a) Does site have groundwater within 5 ft of basin invert?	☐Yes	☐No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr?	☐Yes	☐No
	If "Yes" to either part of Question 5, adequate groundwater information must be available or contact RWQCB for concurrence before approving the site for infiltration.		
6.	Does adequate area exist within the RW to place Infiltration Device(s)? If "Yes", continue to Design Elements sections. If "No", continue to Question 7.	☐Yes	☐No
7.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site Infiltration Devices and how much RW would be needed to treat WQV, or a portion thereof? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 8.	☐Yes	☐No
8.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements – Infiltration Basin

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

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

1.	Has an investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Has an upstream bypass or overflow spillway with scour protection been provided? *	☐Yes	☐No
3.	Is the Infiltration Basin size sufficient to capture the WQV, or portion thereof, with a maximum 96-hour drawdown time? Longer drawdown times may be allowable if vector controls have been implemented (e.g., underground chamber with flap gates) and coordinated with the District/Regional Design Stormwater Coordinator.*	☐Yes	☐No
4.	Can access be provided to the invert of the Infiltration Basin? *	☐Yes	☐No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.5.1)? *	☐Yes	☐No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	☐Yes	☐No
7.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? If No, consider rock or similar protective system. Note: Infiltration Basins may be lined, in which case no vegetation would be required for lined areas.**	☐Yes	☐No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☐Yes	☐No
9.	Can a gravity-fed maintenance drain be placed? **	☐Yes	☐No

Design Elements – Infiltration Trench

1.	Has an investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A, B, and C while preserving an acceptable infiltration rate? *	☐Yes	☐No
3.	Is the Infiltration Trench size sufficient to capture the WQV, or portion thereof, with a maximum 96-hour drawdown time? Longer drawdown times may be allowable, coordinate with the District/Regional Design Stormwater Coordinator.*	☐Yes	☐No
4.	Is the depth of the Infiltration Trench ≤ 13 ft? *	☐Yes	☐No
5.	Can an observation well be placed in the trench? **	☐Yes	☐No
6.	Can access be provided to the Infiltration Trench? *	☐Yes	☐No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using vegetation or a flow splitter with a sump)? **	☐Yes	☐No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality event? **	☐Yes	☐No
9.	Does a perimeter curb or similar device need to be provided (to limit wheel loads upon the trench)? **	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 3

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Biofiltration Swales / Biofiltration Strips

TO BE COMPLETED DURING PS&E

Feasibility

1.	Do the climate and site conditions allow vegetation to be established? If "No", evaluate other BMPs.	☒Yes	☐No
2.	Can biofiltration swale be designed with a slope between 0.25 and 6 percent (with 1 to 2 percent preferred)? If "No", Biofiltration Swales are not feasible.	☒Yes	☐No
3.	Can biofiltration strips be designed with a maximum slope of 2H:1V (with 4H:1V or flatter preferred)? If "No", Biofiltration Strips are not feasible.	☒Yes	☐No
4.	Are Biofiltration device(s) proposed at sites where known contaminated soils exist? If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.	☐Yes	☒No
5.	Does adequate area exist within the RW to place Biofiltration device(s)? If "Yes", continue to Design Elements section. If "No", continue to Question 6.	☒Yes	☐No
6.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site Biofiltration devices and how much RW would be needed to treat WQF? _____ acres If "Yes", continue to Design Elements section. If "No", continue to Question 7.	☐Yes	☐No
7.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project.	☐Complete	

Design Elements

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

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

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * ☐Yes ☐No
2. Can the biofiltration swale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g., freeboard, minimum slope) ☐Yes ☐No
3. Can the biofiltration swale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.4.3)* ☐Yes ☐No
4. Is the maximum length of a biofiltration strip ≤ 100 ft? Strips > 100 ft. may still be considered as long as potential erosion issues have been addressed. ** ☐Yes ☐No
5. Has the minimum width (perpendicular to flow) of the invert of the biofiltration swale received the concurrence of District Maintenance? * ☐Yes ☐No
6. Can biofiltration swales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? * ☐Yes ☐No
7. Has the infiltration rate of the bio-filtration device been calculated and maximized through amendments where appropriate?** ☐Yes ☐No
8. Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train or pretreatment? ** ☐Yes ☐No

   If "Yes", document the amount of runoff treated (WQV/WQF).
9. Has the lining material been selected based on the permissible shear and velocity (refer to HDM Chapter 860 and Table 865.2)?* ☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 4

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Detention Devices

TO BE COMPLETED DURING PS&E

Feasibility

1.	Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems?	☐Yes	☐No
2.	Is basin invert ≥ 5 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) If No to any question above, then Detention Devices are not feasible.	☐Yes	☐No
3.	If the Detention Device is being used to capture traction sand, is the total volume of the device at least equal to the WQV designed to be treated plus the anticipated volume of traction sand, while maintaining a minimum 12-inch freeboard (1 ft)? If No, then Detention Devices are not feasible.	☐Yes	☐No
4.	Does adequate area exist within the RW to place Detention Device? If Yes, continue to the Design Elements section. If No, continue to Question 5.	☐Yes	☒No
5.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site Detention Device and how much RW would be needed to treat WQV? _____ acres If Yes, continue to the Design Elements section. If No, continue to Question 6.	☐Yes	☒No
6.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☒Complete	

Design Elements

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

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

1.	Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *	☐Yes	☐No
2.	Can a minimum freeboard of 12 inches be provided above the overflow event elevation? *	☐Yes	☐No
3.	Is an upstream bypass or overflow outlet provided? *	☐Yes	☐No
4.	Is the drawdown time of the Detention Device a maximum of 96 hours? *	☐Yes	☐No
5.	Is the basin outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *	☐Yes	☐No
6.	Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *	☐Yes	☐No
7.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Otherwise include rock or similar protective system. Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas.*	☐Yes	☐No
8.	Has sufficient access for maintenance been provided? *	☐Yes	☐No
9.	Is the side slope 4:1 (h:v) or flatter for interior slopes? ** (Note: Side slopes up to 3:1 (h:v) allowed with approval by District Maintenance.)	☐Yes	☐No
10.	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
11.	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 7

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Gross Solids Removal Devices (GSRDs)

TO BE COMPLETED DURING PS&E

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 (1-year, 1-hour) 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, and Media Filters may be considered for litter capture, but consult with District/Regional NPDES Coordinator if proposed to meet a TMDL for litter.		
5.	Does adequate area exist within the RW to place Gross Solids Removal Devices? If "Yes", continue to Design Elements section. If "No", continue to Question 6.	☐Yes	☐No
6.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site Gross Solids Removal Devices and how much RW would be needed? _____ acres If "Yes", continue to Design Elements section. If "No", continue to Question 7.	☐Yes	☐No
7.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of 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 6 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

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

1.	Does sufficient hydraulic head exist to place the Linear Radial GSRD? *	☐Yes	☐No
2.	Is a fiberglass reinforced plastic frame and grate being considered for high vandalism areas? Consult District Maintenance. **	☐Yes	☐No
3.	Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by District Maintenance) used to size the device? *	☐Yes	☐No
4.	Was the overflow release device sized for the design storm event?*	☐Yes	☐No
5.	Were the standard detail sheets used for the layout of the devices? ** If No, consult with OHSD and District/Regional Design Stormwater Coordinator.	☐Yes	☐No
6.	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 6 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

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

1.	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 District Maintenance) used to size the device? *	☐Yes	☐No
3.	Is a fiberglass reinforced plastic frame and grate being considered for high vandalism areas? Consult District Maintenance. **	☐Yes	☐No
4.	Was the overflow release device sized for the design storm event?*	☐Yes	☐No
5.	Were the standard details sheets used for the layout of the devices? ** If No, consult with OHSD and District/Regional Design Stormwater Coordinator.	☐Yes	☐No
6.	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: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Media Filters

TO BE COMPLETED DURING PS&E

Caltrans has approved two types of Media Filters: Austin Sand Filter and Delaware Filter. An Austin Sand filter is typically designed for a larger contributing drainage area, while a Delaware Filter is typically designed for a smaller contributing drainage area. 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.

Feasibility – Austin Sand Filter

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

[1]*Longer drawdown times being considered. Refer to the Austin Media Filter Design Guidance.*

Feasibility- Delaware Filter

1. Is the volume of the Delaware Filter equal to the WQV, or portion thereof, using a 40 to 48-hour drawdown? [1] ☐Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 2 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, and used. ☐Yes ☒No

4. Does the project discharge to a water body that has been placed on the 303(d) or has had a TMDL adopted for bacteria, mercury, sulfides, or low dissolved oxygen? ☐Yes ☐No

   If Yes, contact the District/Regional NPDES 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 No to any question, then a Delaware Filter is not feasible

5. Does adequate area exist within the RW to place a Delaware Filter? ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area does not exist within RW, can suitable, additional RW be acquired to site the device and how much RW would be needed to treat WQV, or portion thereof? _____ 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 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

[1] *Longer drawdown times being considered. Refer to the Delaware Media Filter Design Guidance.*

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 6 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

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

1. Is the drawdown time of the device 24 hours? (Longer drawdown times being considered, refer to the *Austin Media Filter Design Guidance*)* ☐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 10.
7. Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 5 ft)? * (If AVSF, see Table B-8 3rd bullet in Application/Siting column.) ☐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. Can vegetation be established at the invert and on the side slopes for erosion control and to minimize re-suspension? If No, include rock or similar protective system. Note: Austin Sand Filters may be lined, in which case no vegetation would be required for lined areas.* ☐Yes ☐No
10. Is maximum depth of sedimentation chamber ≤ 13 ft below ground surface? * If greater than 13 feet, a special design is required. ☐Yes ☐No
11. Can the Austin Sand Filter be placed in an offline configuration? ** ☐Yes ☐No
    If No, go to Question 12.
12. Is the flow line elevation of the over flow pipe set at the same elevation as the top of gabion wall elevation? ** ☐Yes ☐No

    Typically, the flow line should match the top of gabion wall elevation. However, the pipe may require adjustment to fit site condition requirements such as grading and pipe cover conflicts and utility conflicts. Additional overflow designs may be considered (see the *Partial Sedimentation Austin Vault Sand Filter Design Guidance*).

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 6 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

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

1. Is the drawdown time of the device between 40 and 48 hours, typically 40-hrs? (Longer drawdown times being considered, refer to the *Delaware Media Filter Design Guidance)* * ☐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 of sedimentation chamber ≤ 13 ft below ground surface? * ☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 11

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

DPP Infiltration Areas

TO BE COMPLETED DURING PS&E

Feasibility[1]

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
	If "Yes" to any question above, DPP Infiltration Areas are not feasible; stop here and consider other approved Treatment BMPs.		
3.	Are DPP Infiltration Areas proposed at sites where known contaminated soils or groundwater plumes exist? If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.	☐Yes	☐No
4.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project.	☐Complete	

Design Elements

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

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

1.	Has native soil gradation and infiltration rate been determined (see Design Guidance for more detail)? (Must be completed for PS&E level design.) *	☐Yes	☐No
2.	Has the infiltration rate of the DPP Infiltration Area been calculated and maximized through amendments where appropriate? **	☐Yes	☐No
3.	Is the DPP Infiltration Area capacity sufficient to capture the WQV, or portion thereof? **	☐Yes	☐No
	If "No", document the percentage and amount of the WQV captured.	☐ Complete	
4.	Is a surface reinforcing material required?	☐Yes	☐No
	If "Yes", select material based on the permissible shear and velocity (refer to HDM Chapter 860 and Table 865.2).*	☐ Complete	

[1] *This feasibility evaluation is applicable to areas that are being modified for infiltration as part of the project treatment strategy. For existing areas within the project limits that are being delineated as DPP Infiltration Areas, proceed to the Design Elements section.*

DATE: May 2020

Project ID (EA): (04-0G360)

Project Evaluation Process for the Consideration of Construction Site BMPs

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

Construction Site BMPs

Checklist CS-1, Part 1

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Temporary Soil Stabilization

TO BE COMPLETED DURING PS&E

General Parameters

1. How many rainy seasons are anticipated between begin and end of construction? 3
2. What is the total disturbed soil area for the project? (ac) 6.14
3. Consult your District/Regional Design Stormwater Coordinator for the minimum required combination of temporary soil stabilization and temporary sediment controls and barriers for area, slope inclinations, rainy and non-rainy season, and active and non-active disturbed soil areas. ☐ Complete

Scheduling

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

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

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

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

Preservation of Existing Vegetation

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

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

   (b) Protect from clearing and grubbing and other construction disturbance by enclosing the ESA perimeter with high visibility plastic fence or other BMP. ☐ Complete

6. Are there areas of existing vegetation (mature trees, native vegetation, landscape planting, etc.) that need not be disturbed by project construction? Will areas designated for proposed or existing Treatment BMPs need protection (infiltration characteristics, vegetative cover, etc.)? (Coordinate with District Environmental and Construction to determine limits of work necessary to preserve existing vegetation to the maximum extent practicable.) ☒Yes ☐No

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

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

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

Slope Protection

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

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

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

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

Slope Interrupter Devices

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

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

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

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

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

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

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

Channelized Flow

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

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

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

Construction Site BMPs

Checklist CS-1, Part 2

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Sediment Control

TO BE COMPLETED DURING PS&E

Perimeter Controls - Run-off Control

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

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

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

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

Perimeter Controls - Run-on Control

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

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

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

Storm Drain Inlets

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

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

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

4. Can existing or proposed drainage inlets utilize an excavated sediment trap as described in Drainage Inlet Protection - Type 2? ☐Yes ☒No

   (a) Include with other types of Drainage Inlet Protection. ☐Complete

Sediment/Desilting Basin

5. Does the project lie within a Rainfall Area where the required combination of temporary soil stabilization and sediment control BMPs includes desilting basins? ☐Yes ☒No

   (a) Consider feasibility for desilting basin allowing for available right-of-way within the construction limits, topography, soil type, disturbed soil area within the watershed, and climate conditions. Document if the inclusion of sediment/desilting basins is infeasible. ☐Complete

   (b) If feasible, design desilting basin(s) per the guidance in the *CASQA Construction BMP Guidance Handbook* to maximize capture of sediment-laden runoff. ☐Complete

   (c) Designate as a separate contract bid item ☐Complete

6. Is ATS to be used for controlling sediment? ☐Yes ☒No

   (a) If yes, then will desilting basin or other means of natural storage be used? ☐Yes ☐No

   (b) If no, then plan for storage tanks sufficient to hold treatment volume. ☐Complete

7. Will the project benefit from the early implementation of proposed permanent Treatment BMPs? (Coordinate with District Construction.) ☒Yes ☐No

   (a) Edit specifications for permanent Treatment BMP work to be implemented in a manner that will allow its use as a Construction Site BMP. ☐Complete

Sediment Trap

8. Can sediment traps be located to collect channelized runoff from disturbed soil areas prior to discharge? ☐Yes ☒No

   (a) Design sediment traps in accordance with the *CASQA Construction BMP Guidance Handbook*. ☐Complete

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

Construction Site BMPs

Checklist CS-1, Part 3

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Tracking Controls

TO BE COMPLETED DURING PS&E

Stabilized Construction Entrance/Exit

1. Are there points of entrance and exit from the project site to paved roads where mud and dirt could be transported offsite by construction equipment? (Coordinate with District Construction for selection and preference of tracking control BMPs.) ☒Yes ☐No

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

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

Tire/Wheel Wash

2. Are site conditions anticipated that would require additional or modified tracking controls such as entrance/outlet tire wash? (Coordinate with District Construction.) ☐Yes ☒No

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

Stabilized Construction Roadway

3. Are temporary access roads necessary to access remote construction activity locations or to transport materials and equipment? (In addition to controlling dust and sediment tracking, access roads limit impact to sensitive areas by limiting ingress, and provide enhanced bearing capacity.) (Coordinate with District Construction.) ☐Yes ☒No

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

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

Street Sweeping and Vacuuming

1. Is there a potential for tracked sediment or construction related residues to be transported offsite and deposited on public or private roads? (Coordinate with District Construction for preference of including street sweeping and vacuuming with tracking control BMPs.) ☒Yes ☐No

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

Construction Site BMPs

Checklist CS-1, Part 4

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Wind Erosion Controls

TO BE COMPLETED DURING PS&E

Wind Erosion Control

1. Is the project located in an area where standard dust control practices in accordance with *Standard Specifications*, Section 14-903: Dust Control, are anticipated to be inadequate during construction to prevent the transport of dust offsite by wind? *(Note: Dust control by water truck application is paid for through the various items of work. Dust palliative, if it is included, is paid for as a separate item.)* ☐Yes ☒No

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

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

Construction Site BMPs

Checklist CS-1, Part 5

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Non-Stormwater Management

TO BE COMPLETED DURING PS&E

Temporary Stream Crossing & Clear Water Diversion

1. Will construction activities occur within a water body or watercourse such as a lake, wetland, or stream? (Coordinate with District Construction for selection and preference for stream crossing and clear water diversion BMPs.) ☐Yes ☒No

   (a) Select from types offered in Temporary Stream Crossing to provide access through watercourses consistent with permits and agreements.[1] ☐Complete

   (b) Select from types offered in Clear Water Diversion to divert watercourse consistent with permits and agreements.[1] ☐Complete

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

Other Non-Stormwater Management BMPs

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

   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as Water Conservation Practices, Dewatering Operations, Paving and Grinding Operations, Potable Water/Irrigation, Vehicle and Equipment Cleaning, Vehicle and Equipment Fueling, Vehicle and Equipment Maintenance, Pile Driving Operations, Concrete Curing, Material and Equipment Use Over Water, Concrete Finishing, and Structure Demolition/Removal Over or Adjacent to Water.[1] ☐Complete

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

[1] *Coordinate with District Environmental for consistency with US Army Corps of Engineers 404 and 401 permits and Dept. of Fish and Game 1601 Streambed alteration Agreements.*

Construction Site BMPs

Checklist CS-1, Part 6

Prepared by: WRECO Date: May 2020 District-Co-Route: 04-ALA-880, 04-ALA-260

PM: 880-30.47/31.61, 260-R0.78/R1.90 Project ID (or EA): (04-0G360) RWQCB: SF Bay (2)

Waste Management & Materials Pollution Control

TO BE COMPLETED DURING PS&E

Concrete Waste Management

1. Does the project include concrete placement or mortar mixing? ☒Yes ☐No

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

   (b) Designate as a separate contract bid line item if the quantity of concrete waste and washout are anticipated to exceed 5.2 yd^3 or if requested by Construction. ☐Complete

Other Waste Management and Materials Pollution Controls

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

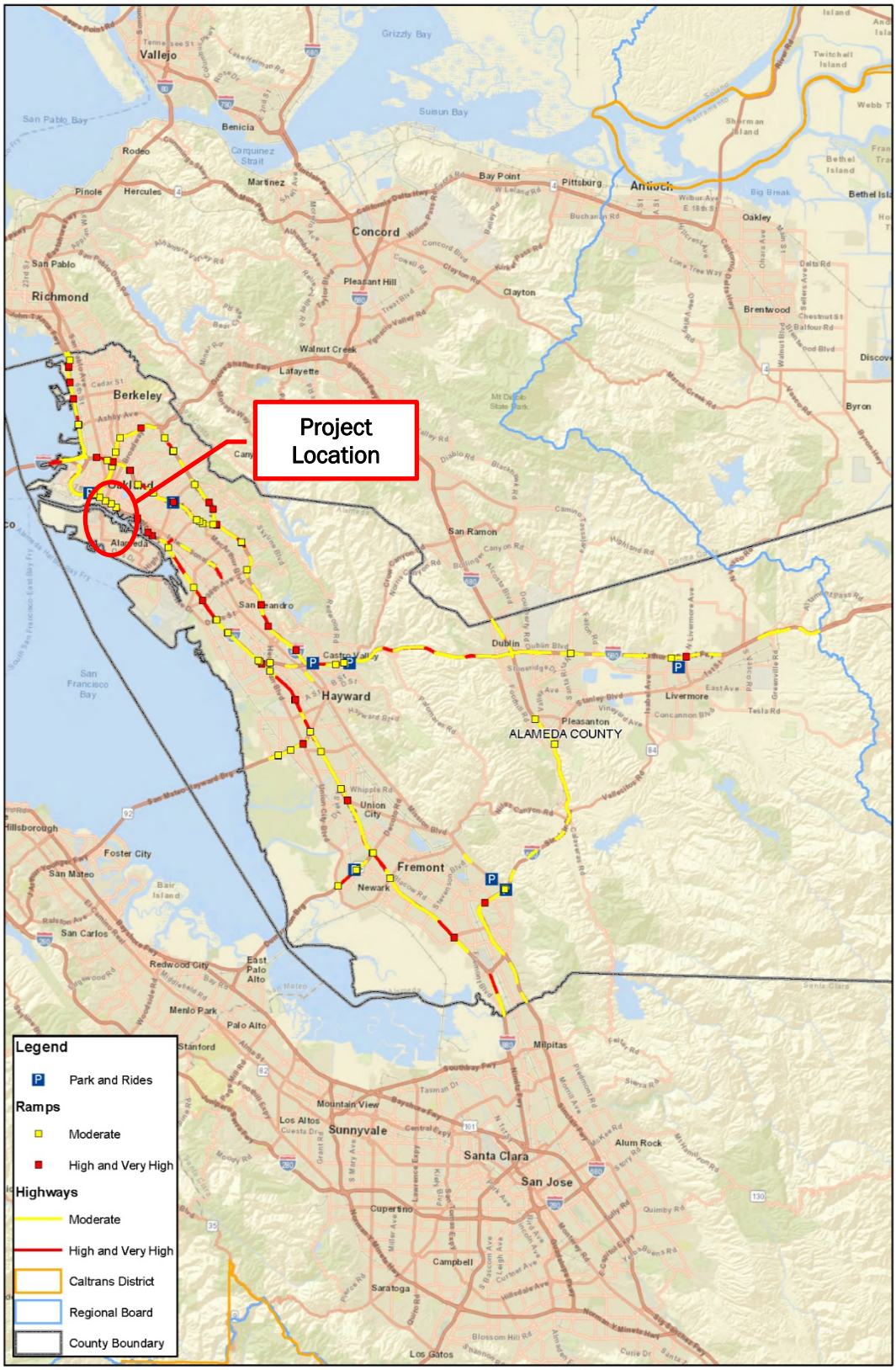
   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as Material Delivery and Storage, Material Use, Spill Prevention and Control, Solid Waste Management, Hazardous Waste Management, Contaminated Soil Management, Sanitary/Septic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

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

Temporary Stockpiles (Soil, Materials, and Wastes)

3. Are stockpiles of soil, etc. anticipated during construction? ☒Yes ☐No

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


Project Location
Legend
Park and Rides
Ramps
Moderate
High and Very High
Highways
Moderate
High and Very High
Caltrans District
Regional Board
County Boundary
ALAMEDA COUNTY
Vallejo
Benicia
Martinez
Concord
Pittsburg
Antioch
Richmond
Berkeley
Oakland
Alameda
San Leandro
Hayward
Castro Valley
Dublin
Pleasanton
Livermore
San Ramon
Walnut Creek
Pleasant Hill
Clayton
Brentwood
Oakley
Fremont
Newark
Union City
Milpitas
Sunnyvale
Santa Clara
San Jose
Mountain View
Palo Alto
Menlo Park
Redwood City
San Mateo
Foster City
San Carlos
Hillsborough
Los Gatos
Campbell
Saratoga
Cupertino
Los Altos
Stanford
Grizzly Bay
Suisun Bay
San Pablo Bay
San Francisco Bay
0 3 6 Miles
2018 District 4 STGAs
Alameda County