3.2.2 Water Quality and Stormwater Runoff

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977, and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NDPES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California’s Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards

cannot be met through point source controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

NPDES Program

The SWRCB adopted Caltrans Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices (BMPs). The proposed Project will be programmed to follow the guidelines and procedures outlined in the 2003 SWMP to address storm water runoff or any subsequent SWMP version draft and approved.

Municipal Separate Storm Sewer System Program

The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, country, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. As part of the NPDES program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

Construction Activity Permitting

Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)." Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, will become effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a DSA of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

The newly adopted permit separates projects into Risk Levels 1–3. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP).

Caltrans Statewide NPDES Permit requires the Department to submit a Notice of Construction (NOC) to the RWCB to obtain coverage under the Construction General Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Department projects until a new Caltrans Statewide NPDES Permit is adopted by the SWRCB. An NOC or equivalent form will be submitted to the RWQCB at least 30 days prior to construction if the associated DSA is 1 acre or more. In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is used for projects with DSA less than 1 acre.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

Affected Environment

The following discussion is based on information taken from the *I-80/I-680/SR-12 Interchange Project, Stormwater Data Report (*SWDR) and *I-80/I-680/SR-12 Interchange Project, Water Quality Report* prepared for the proposed project in 2010.

The project area is within the watersheds of Jameson Creek, Green Valley Creek, Dan Wilson Creek, Suisun Creek, American Canyon Creek, Pennsylvania Avenue Creek, Raines Drain, Alonzo Drain, and Ledgewood Creek. The general topography of the land is gradually sloping to the south towards Suisun Bay, 15 miles downstream. These creeks and drainages cross the project area and discharge to the Suisun Marsh wetlands, which are between 1 and 2 miles downstream. The proposed project is located in the Suisun-Fairfield Valley groundwater basin (basin 2-3). The depth to groundwater ranges from three to 20 feet as reported in the as-built Log of Test Borings from 1950, 1960, and 1970.

The *Water Quality Control Plan for the San Francisco Bay Basin* (basin plan) establishes beneficial uses for waterways and water bodies within the region. Existing beneficial uses for Suisun Creek include freshwater supply, areas of special biological significance, cold freshwater habitat, fish migration, water contact recreation (potential), noncontact water recreation (potential), fish spawning, warm freshwater habitat, and wildlife habitat (San Francisco Bay Regional Water Quality Control Board 2007). Ledgewood Creek is the only other water body with defined beneficial uses in the basin plan. The beneficial uses for Ledgewood Creek are the same as Suisun Creek, with the exception that both contact and noncontact water recreation beneficial uses are existing as opposed to potential (San Francisco Bay Regional Water Quality Control Board 2007).

Section 303(d) of the 1972 CWA states that territories and authorized tribes are required to develop a list of water quality–limited segments that do not meet water quality standards, even after point sources of pollution have the minimum required levels of pollution control technology. The water bodies to which the proposed project discharges are not listed on the EPA's 303(d) List of Water Quality Limited Segments.

Of the named water bodies within the project vicinity, the San Francisco Bay RWQCB lists only the Suisun Marsh wetlands as impaired. Specifically, metal concentrations such as arsenic, cadmium, chromium, copper, lead, nickel, and zinc from urban runoff and storm sewers exceed the targeted design total maximum daily loads (TMDLs). However, the proposed project will not directly drain into the Suisun Marsh and these constituents have low TMDL priority. Farther downstream, the Suisun Bay and Carquinez Strait also contain several CWA Section 303(d)–listed pollutants (organic compounds, polychlorinated biphenyls [PCBs], mercury, selenium, general particulates, dissolved metals, nutrients, and salinity). A 2008 Draft List for TMDLs was adopted by the San Francisco Bay RWCQB in February 2009. When finalized these TMDLs will be required control targets for the project. As construction phases occur, the current TMDL requirements should be identified and met, in addition to consultation with the San Francisco Bay RWCQB.

Based on the highway stormwater runoff data collected by the Department's Storm Water Research and Monitoring Program, pollutants that are expected to be found in runoff from the proposed action include conventional constituents (biochemical oxygen demand [BOD], calcium carbonate [$CaCO_3$], chemical oxygen demand [COD], total dissolved solids [TDS], total organic carbon [TOC], total suspended solids [TSS] and total volatile suspended solids [TVSS], etc.) hydrocarbons, metals, microbial agents, nutrients, volatile organics, semi-volatile organics, pesticides, and herbicides. Pollutants are usually deposited on the roadway as a result of fuel combustion processes, lubrication system losses, tire and brake wear, transportation load losses, paint from infrastructure, and atmospheric fallout. Constituent testing for another project in the area (the I-80 HOV widening project) revealed ADL soils are present within the project's limits. Sources of specific pollutants are outlined in Table 3.2.2-1 below.

Table 3.2.2-1. Known Roadway Pollutants

Constituents	Primary Sources
Particulates	Pavement wear, vehicles, atmosphere, maintenance, snow/ice abrasives, sediment disturbance
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application, sediments
Lead	Auto exhaust, tire wear, lubricating oil and grease, bearing wear, atmospheric fallout
Zinc	Tire wear, motor oil, grease
Iron	Auto body rust, steel highway structures, moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicide and insecticide application
Cadmium	Tire wear, insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline, lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Bromide	Exhaust
Cyanide	Anticake compound used to keep deicing salt granular

Constituents	Primary Sources
Sodium, Calcium	Deicing salts, grease
Chloride	Deicing salts
Sulphate	Roadway bed, fuel, deicing salts
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt leachate
PCBs, Pesticides	Spraying of highway rights-of-way, atmospheric deposition, PCB catalyst in synthetic tires
Pathogenic bacteria	Soil litter, bird droppings, trucks hauling livestock/stockyard waste
Rubber	Tire wear
Asbestos[a]	Clutch and brake lining wear

Source: Federal Highway Administration 1996.
[a] No mineral asbestos has been identified in runoff; however some breakdown products of asbestos have been measured.

Soils information for the project area has been obtained from the related project geotechnical reports and the U.S. Department of Agriculture, National Resource Conservation Service. The soils within the project limits are as described in Table 3.2.2-2 below.

Table 3.2.2-2. Soils in the Project Area

Map Unit Name	Map Unit Symbol	Hydrological Soil Group
Sycamore silty clay loam	(Sr)	D
Yolo Silty clay loam	(Ys)	D
Sycamore silty clay loam	(Sr)	D
Sycamore silty clay loam drained	(Ss)	D
Sycamore silty clay loam	(Sr)	D
Antioch-San Ysidro Complex, 0-2 percent slopes	(AoA)	
Brentwood clay loam, 0-2 percent slopes	(BrA)	D
Antioch-San Ysidro Complex, thick surface, 0-2 percent slopes	(AsA)	
Pescadero clay	(Pe)	D
Clear Lake clay, 0-2 percent slopes	(CeA)	D

Hydrological Group D soils have the highest runoff potential, very low infiltration rates when thoroughly wetted, and may be subject to erosion by water.

Environmental Consequences

Increased Runoff and Associated Operational Water Quality Issues

Implementation of both alternatives would involve significant mainline and interchange improvements. The general drainage design is to collect and convey pavement runoff while not conveying runoff within the travelled way. Once collected from the pavement or graded areas, runoff will be conveyed in non-erosive culverts, ditches, or swales to an existing waterway that currently receives highway runoff. The project alternatives would increase the amount of stormwater runoff within the state right-of-way by increasing the total impervious surface. The approximate acreage of impervious surface for each of the project alternatives is summarized in Table 3.2.2-3 below.

Table 3.2.2-3. Acreage of Impervious Surfaces

Alternative	New Impervious	Reworked
B	128.2 acres	251.7 acres
C	123.2 acres	219.9 acres
B-1	27.8 acres	71.4 acres
C-1	51.9 acres	90.1 acres

Increased runoff and operation water quality issues are integral to projects with new or reconstructed impervious surfaces. Increased impervious surfaces result in increased stormwater runoff which could lead to additional pollutants entering waterways. The project alternatives will incorporate approved permanent stormwater treatment BMPs to minimize potential water quality impacts. The exact amount of new or reconstructed pavement tributary to each waterway for each project alternative has not been determined at this phase of the project.

Effects on the receiving water bodies would be the result of capacity changes to the hydraulic features of the drainage system. To manage the stormwater runoff the on-site drainage facilities would be reconfigured within the proposed right-of-way as part of the project design. Additionally, stable cavities discussed in Section 3.2.1 would reduce the potential of flooding and, therefore, the potential for resulting water quality issues. Therefore, the associated watersheds would be only minimally affected from the additional stormwater runoff from the increase in impervious surface.

Stable cavities are meant to be spaces, vaults, or other below ground storage devices, for storm runoff intended to mitigate for lost floodplain storage. The cavities will not impact the groundwater because they are intended to be placed at or above the existing ground elevation within the new fill for the westbound truck sales.

Both project alternatives have very similar water quality issues. The magnitude of the issues is very similar with both alternatives covering an area of approximately 350 acres of new or reworked pavement plus over 100 acres of graded surfaces. The footprint for both of these alternatives is substantially the same with no conditions or issues unique to either alternative.

Likewise, under the fundable first phase of either alternative, there would also be increased runoff and associated water quality issues. However the magnitude of runoff impacts for the fundable first phases of both alternatives are significantly reduced due to the smaller project footprints (100 acres of total new or reworked pavement for Alternative B, Phase 1, and 140 acres of total new or reworked pavement for Alternative C, Phase 1) compared to the full build alternatives.

All of the waterways in the project area are included in three hydrologic sub-areas 207.21, 207.22 and 207.23 as defined by the State Water Board. None of these hydrologic sub-areas currently have defined TMDL listings. (A draft TMDL listing dated 2008, not yet approved, lists Suisun Creek with dissolved oxygen and temperature, and Ledgewood Creek with diazinon.) At the downstream end of these three watersheds is the Suisun Marsh Wetlands for which there are Targeted Design Constituents of metals and nutrients. The proposed permanent treatment BMPs such as bioswales, biostrips, and infiltration devices will be effective for metals and nutrient uptake, minimizing the project impacts of these constituents (and others) to the receiving waters

and the Suisun Marsh Wetlands. Treatment BMPs are included in all alternative layouts to manage all possible pavement runoff.

Discussions of other water quality issues are included in Section 3.2.1 (Hydrology and Floodplain), Section 3.2.5 (Hazardous Waste/Material), Section 3.3.2 (Wetlands and other Waters), the discussions of fish species in Section 3.3.4 (Animal Species) and Section 3.3.5 (Threatened and Endangered Species) and other sections within this document. Refer to Chapter 4, CEQA Evaluation, for discussion of non-jurisdictional perennial marsh, and non-jurisdictional seasonal wetland.

There would be no increase in pavement under the No-Build Alternative and therefore no potential to increase runoff and associated water quality issues.

According to the Department's NPDES permit and the Construction General Permit, best management practices (BMPs) will be incorporated into the proposed project to reduce the discharge of pollutants during construction and operation to the maximum extent practicable. These BMPs fall into three categories: temporary construction site BMPs, design pollution prevention BMPs, and permanent treatment BMPs. Temporary construction site BMPs are discussed below under construction impacts.

Permanent Design Pollution Prevention BMPs

Slope/Surface Protection Systems
To minimize erosion from any of the new slopes, mitigating design features have been considered, including minimizing cut-and-fill slopes, shaping slopes to reduce concentrated flow, and collecting concentrated flows in stabilized channels. All graded slopes, either cut or fill, will be constructed with proper erosion control and permanent plantings. Except at bridges, no retaining walls are anticipated.

Certain areas of the project alternatives would be hardscaped as required for safety (ramp gores), maintenance (pullout areas), and slope stability (under bridges).

Construction of the project alternatives would remove moderate amounts of vegetation within the project right-of-way. In many locations, the project alternatives would replace existing unpaved areas with pavement or impervious structures. At all areas where new slopes are constructed, proper vegetation will be planted, monitored, and maintained to establish permanent cover. Approval of the erosion control plan by the Department's Division of Design, Landscape Architecture will occur during final design.

To minimize erosion potential, slopes will be rounded and or shaped to reduce concentrated flows, concentrated flows will be collected in stabilized drains or channels, slopes will be 1:4 or flatter and those greater than 1:2 will have an erosion control plan approved by the district landscape architect according to the project Geotechnical Design Report.

Given the characteristics of the in-situ soils, there are some slope stability concerns on this site. Slope and surface protection systems will be incorporated per Checklist DPP-1, Part 3. To minimize erosion from any of the slopes the methods being considered include:

- Minimizing cut and fill slopes,
- Shaping slopes to reduce concentrated flow, and
- Collecting concentrated flows in stabilized channels.

Concentrated Flow Conveyance Systems

Concentrated flow conveyance systems are used to collect, transport, convey, and/or dissipate stormwater flows. A variety of concentrated flow conveyance devices exist along the length of the proposed project. Along most of the existing reach of the highway, runoff sheet-flows off of the pavement, crossing several feet of vegetated strips before entering a swale oriented longitudinally to the right-of-way. The existing concentrated flow conveyance devices include lined and unlined ditches and swales, drainage inlets and culverts, asphalt concrete (AC) dikes and overside drains, flared end sections, rock slope protection (RSP) pads, flow energy dissipation devices, and other approved drainage design devices. For the proposed project, the planned drainage pattern will replicate as much as possible the existing runoff pattern. The drainage improvements will direct pavement runoff to sheet flow to the outside edge of the new pavement where improved drainage devices will collect and convey the project runoff.

Preservation of Existing Vegetation

One goal of the project alternatives and construction activities is to preserve areas of existing vegetation wherever possible. Preserving existing vegetation is essential in the protection of water quality due to the elevated chances of cleared areas increasing erosion and sedimentation to waterways. At all areas where existing vegetation (on land to remain) is affected, or where new slopes are constructed, proper vegetation will be placed, monitored, and maintained to establish permanent cover. For those areas on the outside of the highway, pavement will be minimized in favor of retaining existing vegetative cover. In many locations the proposed project will replace existing unpaved areas with impervious surface. Approval of the erosion control plan by a landscape architecture and maintenance plan will occur in final design.

Bridge construction will take place at all seven water crossings that are ESAs. ESAs exist at other project locations as well and are potentially affected by the proposed project.

Permanent Treatment BMPs

Because the project alternatives are considered a major reconstruction project, they are not exempt from incorporating treatment BMPs. Treatment BMPs are permanent devices and facilities that will store and treat increased stormwater runoff expected with operation of the project alternatives in an effort to preserve water quality and reduce the potential for flooding. The Department's approved treatment BMPs are biofiltration swales, infiltration basins, detention basins, traction sand traps, dry weather flow diversions, media filters, gross solids removal devices (GSRDs), multi-chamber treatment trains, and wet basins. Those most feasible in the Bay Area are biofiltration swales, infiltration basins, detention basins, media filters, multi-chamber treatment trains, and wet basins.

Because of potential high groundwater within the project area, infiltration and detention basins would not be feasible. As such, biofiltration swales and biostrips have been investigated as possible alternatives. Both treatment BMPs treat the same types of constituents: TSS, particulate metals, and litter. Both biofiltration swales and strips are viable cost-effective treatment BMPs.

Because of the limited permeability of the soils and potentially high groundwater, infiltration devices and other filters allowing percolation of stormwater back into the ground are not a consideration. However, engineered biofiltration strips and swales are proposed. Biofiltration strips and swales are effective at trapping litter, TSS, and particulate metals. Where possible, it is recommended that the existing vegetation be evaluated for use as effective biostrip cover, or the proposed project should establish the proper vegetative cover and/or swale dimensions at each treatment location.

Locations within the project limits (primarily in the area between the toe of fill slopes and the right-of-way) are available to be used for permanent treatment BMPs. Plans developed at a later stage in design will be more specific in their location, size, vegetative characteristics, and performance measures.

Biofiltration Swales/Strips

Due to the flat topography of the project area, biofiltration would be the primary treatment option for stormwater runoff. Preliminary plans provided in the SWDR identify all potential BMP locations. Exact locations will be determined during final project design. Biostrips would be designed to provide the maximum water quality treatment time of stormwater. The tributary area to the biostrips is the length of pavement from the highway median to the outside edge of pavement. Bioswales would be designed according to the Department's guidance documents, to ensure maximum treatment of water. Additional right-of-way for the project improvements and treatment BMPs has been identified and is included on the project layout sheets included in the SWDR.

Dry Weather Diversion

Dry weather flow diversion BMPs were dropped from further considered for the proposed project because there is no dry weather flow.

Infiltration Devices

Infiltration device BMPs are not feasible for the project alternatives for the following reasons:

- Through much of the project area, the groundwater is too high.
- Most of the soils are Hydraulic Soil Group C or D, limiting the usefulness of infiltration.
- A gravity outlet cannot be created because of the flat terrain.
- There is no room within the right-of-way along most of the project area.
- Areas beyond the right-of-way are mostly prime farmland under cultivation.

Detention Devices

Detention basin BMPs are not feasible for the project alternatives for the following three reasons:

- There is not enough hydraulic head available for proper design.
- There are several locations where the groundwater is high.
- Along most of the project area, there are significant constraints on acquiring new right-of-way, with areas beyond the existing right-of-way consisting mostly of prime farmland under cultivation.

Detention as a treatment device may have negative hydraulic impacts because the project alternatives are located far downstream in the watershed, and detaining the peak runoff from the tributary shed may increase the peak runoff from the entire shed. If hydromodification control is a requirement of the approved project alternative, then detention facilities can be designed for that mitigation, but they would not specifically function as treatment for the reasons stated.

Gross Solids Removal Devices

Litter is not on the 303(d) list or identified as a TMDL for the water bodies near the project area; therefore, GSRDs are not incorporated.

Traction Sand Traps

Traction sand trap BMPs are not appropriate for the project alternatives because traction sand is not applied within the project limits.

Media Filters

Media filter BMPs are not feasible for the project alternatives for the primary reason that the seasonally high groundwater table is likely to be too close to the invert of the filter. Depending on the specific location within the project limits, there are two other reasons that media filters are not an appropriate consideration: 1) there is not enough hydraulic head available for proper design, and 2) along most of the project area, there is no room within the right-of-way, and areas beyond the right-of-way are completely developed.

Multi-Chambered Treatment Trains

Multi-chambered treatment train BMPs are used to treat stormwater in critical source areas. Critical source areas are more common in urbanized environments and are established to facilitate the treatment stormwater runoff in particularly vulnerable or polluted areas. The project alternatives are not considered to be located in a critical source area.

Wet Basins

Wet basin BMPs are not feasible for the project alternatives for the following reasons:

- There is not enough hydraulic head available for proper design.
- There are several locations where the groundwater is high along much of the project area.
- There is limited ability to purchase additional right-of-way, and areas beyond the right-of-way are largely developed.

- Along most of the project area, there is no permanent source of water available to maintain a permanent wet pool.

Maintenance BMPs (Drain Inlet Stenciling)
Nearly all the improvements under both alternatives are located within the highway right-of-way. However, no drain inlet stenciling is necessary for these inlets. At locations where ramp termini meet local streets where pedestrian access is possible, inlet stenciling will be placed on inlets. This stenciling will inform the public that no dumping is allowed and will help protect water quality.

Hydromodification Control
All state or local transportation projects and some non-transportation projects must incorporate hydromodification measures to ensure that hydraulics and flooding are not affected by the new construction.

Potential Water Quality, Erosion and Sediment Control Issues during Construction

Disturbed soil could cause potential erosion and sediment control issues during the construction of all build alternatives. During the storm season, disturbed soil is exposed and can erode into rills and transport sediment to waterways.

Construction of the project alternatives would involve the use of construction equipment and associated fuels, solvents, lubricants, and other pollutants. These substances may be released into the environment during construction and could result in adverse effects to water quality.

Proper erosion and sediment control measures would be effective because of the relatively flat terrain and low grading heights. Preparing and implementing a SWPPP and implementing best management practices would reduce the severity of this effect.

Under the fundable first phases, there would also be potential water quality, erosion, and sediment control issues, however, to a lesser extent because the project footprints are not as large.

The follow construction site BMPs will be in place during construction.

Construction Site BMPs
Construction site BMPs would be applied during construction activities to reduce the pollutants in the stormwater discharges throughout construction. Temporary construction BMPs included in the Department's *Storm Water Quality Handbook* will be included in the SWPPP. Such BMPs may include the following:

- Hydraulic mulch.
- Hydroseeding.
- Soil binders.
- Silt fence.

- Sediment traps.
- Sand bags.
- Fiber rolls.
- Straw bale barrier.

One critical construction activity, dewatering, may be necessary for the proposed project because of the high groundwater levels. Early discussion will be initiated regarding the handling and disposal of this water during the design phase. A project-specific Low Threat Discharge and Dewatering NPDES permit that would contain Waste Discharge Requirements to ensure that the groundwater meets or exceeds water quality standards prior to discharge may be required from the RWQCB if substantial dewatering is to be done.

It is anticipated that dewatering will need to occur at all bridge locations involved in the chosen project alternative. A Notice of Intent shall be submitted and a NPDES Low Threat Discharge and Dewatering Permit obtained from the San Francisco Bay RWQCB prior to any dewatering.

At this phase of the project development process, no specific coordination with the Department's Division of Construction has occurred for the stormwater management issues.

Potential to Require Dewatering during Construction

According to the SWDR for the project, groundwater levels in the project area range from three feet to 18 feet below ground surface. As such, groundwater may be encountered during structure excavations. Proper handling, treatment, and discharge of groundwater would be performed as necessary. It is anticipated that dewatering of groundwater would need to be done at all bridge locations involved in the chosen project alternative. Groundwater in the general area is used for local domestic and agricultural use. Quality is generally good with typically minimal treatment.

There would be no construction under the No-Build Alternative and therefore no potential to require dewatering.

Avoidance, Minimization, and/or Mitigation Measures

With implementation of BMPs no avoidance, minimization or mitigation measures would be necessary.