Appendix M

Draft Water Quality Study Report for the East-West Connector Project

East-West Connector Project
In the Cities of Union City and Fremont, Alameda County, California

Draft Water Quality Study Report

Submitted to:

Alameda County Transportation Authority

T·Y·LIN INTERNATIONAL

Prepared by:

WRECO

March 2009

East-West Connector Project
In the Cities of Union City and Fremont, Alameda County, California

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Prepared for:
Alameda County Transportation Authority

This report has been prepared by or under the supervision of the following Registered Engineer. The Registered Civil Engineer attests to the technical information contained herein and has judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

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Date

March 2009

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Executive Summary

The East-West Connector (EWC) Project is located in the Cities of Fremont and Union City. Three agencies have jurisdiction over the EWC Project: the City of Fremont, the City of Union City, and the California Department of Transportation (Caltrans). The proposed EWC Project alignment would provide a four-lane roadway from the Mission Boulevard/State Route 238 (SR 238) and the Appian Way Intersection to the east, to the Paseo Padre Parkway to the west. The EWC Project would also widen both the Paseo Padre Parkway and Decoto Road, from four to six lanes.

The purpose of this Water Quality Study Report is to evaluate the potential for water quality impacts to existing surface watercourses and/or ground water resources within the EWC Project limits. The general approach to the Project is to evaluate whether there would be significant effects from the Project on water quality. The components of this study include: the regulatory background that the EWC Project should adhere to; the proposed project activity, which may cause potential temporary and permanent impacts to water resources; as well as proposed mitigation and minimization measures to address these impacts.

The EWC Project is within the South Bay Hydrologic Unit and the Alameda Creek Hydrologic Area. The majority of the soils within the EWC Project area comprise Hydrologic Soil Groups (HSGs) B, C, and D, which indicates that the soils within the EWC Project have medium to low infiltration rates when saturated. The *Geologic and Seismic Report* states that groundwater was encountered at Elevation +12.0 to +27.0 ft (Depth of 23.0 ft to 34.0 ft).

The proposed EWC Project alignment would discharge into and cross the following water bodies: 1) the ACFCC (ACFCC); 2) Old Alameda Creek; and, 3) Alameda County Flood Control and Water Conservation District's (ACFC & WCD) Line M Channel. According to the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), the ACFCC and its tributaries have the following beneficial uses which include, but are not limited to: groundwater recharge; cold freshwater habitat; warm freshwater habitat; water contact recreation; and noncontact recreation. There are also surface water quality objectives for discharges into these water bodies that include limitations for discharge of Total Suspended Solids (TSS) and Chlorides The ACFCC and its tributaries are listed in the Clean Water Act (CWA) Section 303(d) List as impaired for Diazinon; the potential source of pollution is urban runoff and storm sewers. There are no Total Maximum Daily Loads (TMDLs) for the ACFCC and its tributaries.

The EWC Project lies on the Niles Cone Groundwater Subbasin. This groundwater basin consists of a non-permeable aquifer composed of a series of relatively flat lying aquifers separated by extensive aquitards.

The EWC Project has the potential to cause temporary and permanent impacts to existing jurisdictional areas of the United States Army Corps of Engineers (USACE), California Department of Fish & Game, and the SFBRWQCB . The impacts of the Project would

include the loss of biotic/aquatic (wetland) areas serving important water quality or water resources functions; changes to the stream bank configurations, and loss of the riparian habitat of the existing waterways. The majority of sensitive biological resources that may be affected by the EWC Project are located within the Historic Parkway Alignment from Mission Boulevard, at the northeast end of the alignment, southeast to Paseo Padre Parkway. These temporary impacts can be a result of temporary stream diversion installation and removal, and streambed disturbance during culvert removal. Permanent impacts would be associated with permanent fill in jurisdictional areas due to bridge construction and road construction. The total acreage of permanent loss of wetlands and other waters of the United States was 1.47 acres, and the total acreage of potential waters of the State was 2.85 acres.

In addition, the EWC Project would have potential temporary and permanent water quality impacts to storm water runoff with the addition of a new roadway alignment and widening of existing city streets. The Project would have a Disturbed Soil Area (DSA) of 55.69 ac; the increase in impervious areas would be 19.10 ac for Union City, 6.55 for City of Fremont, and 0.17 ac for Caltrans, and the reworked impervious area would be 0.54 ac for Union City, 2.42 ac for City of Fremont, and 0.68 ac for Caltrans. Short term impacts are generally from construction activities, such as grading work or dewatering. Temporary Best Management Practices will be considered for this Project to prevent potential water quality degradation during construction.

Long term impacts from the EWC Project could result from potential increases to velocity and volume of downstream flows due to added impervious areas. Permanent Best Management Practices (BMPs) and Integrated Management Practices (IMPs) would be considered to address these impacts, to reduce erosion, and collect and treat roadway runoff as required by the Alameda Countywide Clean Water Program (ACCWP) and Caltrans' National Pollutant Discharge Elimination System (NPDES) Permits.

Overall, the EWC Project's overall design goal would be to avoid water resources to the Maximum Extent Practicable (MEP), to maximize treatment of storm water runoff, and to reduce erosion by metering or detaining post-project runoff rates to pre-project rates. By meeting these goals and incorporating other applicable NPDES permit requirements, water quality impacts should be minimized and therefore should not be significant.

Acronyms

ACCWP	Alameda Countywide Clean Water Program
ACWD	Alameda County Water District
ACFC & WCD	Alameda County Flood Control and Water Control District
ACFCC	ACFCC
ACTA	Alameda County Transportation Authority
BHF	Below Hayward Fault
BMP	Best Management Practices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CWA	Clean Water Act
DSA	Disturbed Soil Area
DSM	Deep Soil Mix
EIR/EIS	Environmental Impact Report/ Environmental Impact Statement
ESAs	Environmentally Sensitive Areas
EWC	East-West Connector
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Report Map (FIRM)
FIS	Flood Insurance Study (FIS)
FY	Fiscal Year
HEC-RAS	Hydrologic Engineering Center- River Analysis System
HSG	Hydrologic Soil Group
HGL	Hydraulic Grade Line
IMP	Integrated Management Practice
MEP	Maximum Extent Practicable
MGD	Million Gallons per Day
MS4	Municipal Separate Storm Sewer System
NRCS	Natural Resource Conservation Service
NPDES	National Pollutant Discharge Elimination System
RTP	Bay Area's Regional Transportation Plan
RMAS	Regional Monitoring and Assessment Strategy
R/W	Right-of-Way
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SR	State Route
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solid
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solid
US	United States

USACE	United States Army Corp of Engineers
USDA NRCS	United States Department of Agriculture National Resources Conservation Service
US EPA	United States Environmental Protection Agency
USGS	United State Geological Survey
WQA	Water Quality Act

1 GENERAL DESCRIPTION

The East-West Connector (EWC) Project is located in Alameda County, between Interstate 880 (I-880) to the west and Mission Boulevard/State Route 238 (SR 238) to the east (Figure 1). The EWC Project is 3.0 mi long and is located in the Cities of Fremont and Union City. Both cities are in the lower portion of the Alameda Creek and its tributaries. The overall objectives of the EWC Project include:

- Provision of turn lanes on Mission Boulevard/SR 238 for a distance of approximately 1,000 ft, north to south of the Mission Boulevard and Appian Way Intersection
- Construction of a new four-lane roadway from the Intersection of Appian Way and Mission Boulevard to Alvarado-Niles Road
- Reconstruction Alvarado-Niles Road to accommodate the new EWC roadway
- Construction of a new 4-lane roadway from Alvarado Niles Road to Padre Parkway
- Widening of the Paseo Padre Parkway to six lanes from Isherwood Way to Decoto Road
- Widening of Decoto Road to six lanes from Paseo Padre Parkway to Cabrillo Drive

Implementation of the above improvements would result in:

- Improved mobility and congestion relief
- Reduced travel time for commuters
- Additional access to constructed and planned projects
- Improved emergency response by decreasing local traffic congestion
- Reduction in congestion related accidents

Figure 1. Vicinity Map

Source: United States Geological Survey (USGS)

1.1 Project Hydraulic Modifications

The following are the major hydraulic modifications identified for the EWC Project:

- A new bridge constructed over the Alameda Creek Flood Control Channel (ACFCC)
- Two new bridges built over Old Alameda Creek
- A new Line M Channel Bifurcation Pipe constructed connecting Old Alameda Creek and the Zone 5 Line M Channel
- The replacement of the impacted section of the Line M Channel, under the new roadway alignment, with a new culvert
- The removal of existing detention basins along the proposed new roadway alignment
- Installation of a new pump station for capturing and discharging water from the depressed roadway section
- An on-site storm drain system designed for the new alignment
- Modifications to storm drains on Decoto Road and the Paseo Padre Parkway

1.2 Purpose of Study

The purpose of this Water Quality Study Report is to evaluate the potential for water quality impacts to existing surface watercourses and/or ground water resources within the EWC Project limits. The general approach of the Project is to evaluate whether there would be significant effects from the project on water quality. This study includes the regulatory background that the EWC Project should adhere to, the proposed project activity which may cause potential temporary and permanent impacts to water resources, as well as the proposed mitigation and minimization measures to address these impacts.

1.3 Project History

In the 1960s, Caltrans formulated a long term plan to provide a parallel route to I-880. This included the construction of a freeway, commonly referred to as the "Hayward Bypass" (Bypass) to connect Mission Boulevard to I-580. The Bypass would have its northern terminus at I-580, and would connect to Mission Boulevard/SR 238 at the Industrial Parkway. As a companion project, Caltrans proposed to realign State Route 84 (SR 84) as a six-lane freeway from Mission Boulevard near Appian Way to the I-880/Decoto Road Interchange in the Cities of Fremont and Union City. Caltrans preserved the right-of–way (R/W) along the proposed SR 84 alignment corridor and the Route 84 Realignment Project; this information was included in the Bay Area's Regional Transportation Plan (RTP).

By the 1980s, the traffic congestion increased on both I-880 and the East-West travel corridors in the general area of Decoto Road, Peralta Boulevard, Thornton Avenue, and Mowry Avenue. The congestion was expected to significantly worsen as a result of projected growth in Fremont, Union City and the surrounding areas. In the 1980s,

funding became available and environmental studies for both projects commenced. Both projects encountered significant local opposition, which prolonged the environmental review processes. In 2002, Caltrans and the Federal Highway Administration (FHWA) completed a final combined Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Route 84 Realignment Project. However, the document was not certified due to continued local opposition over the alignment location and its potential environmental impacts to the surrounding communities. At the same time, Caltrans decided not to proceed with the Hayward Bypass Project.

In order to address the projected and on-going traffic congestion problems in the SR 84 area, the Alameda County Transportation Authority (ACTA) assumed the lead agency role for the Route 84 Realignment Project. Upon assuming the lead, ACTA worked with the City of Fremont, City of Union City, local community members and organizations; to redefine the purpose of the Project and to develop alternative alignment options. A conceptual alternative, which was designated along Decoto Road to Alvarado-Niles Road to the historic parkway alignment to Mission Boulevard, was analyzed in early 2004. However, this alternative was found to be unacceptable. Two additional conceptual alternatives were considered, “Option 2” and “Option 4/6.” Through further preliminary design, environmental constraints studies and community input, Option 2 was developed further to become the proposed EWC Project alignment. In general, the proposed EWC Project alignment would provide: a new four-lane roadway from the Mission Boulevard/SR 238 and Appian Way Intersection on the east, to Paseo Padre Parkway on the west; and the widening of both Paseo Padre Parkway and Decoto Road to six lanes.

2 REGULATORY SECTION

This section summarizes the regulatory context in which issues associated with water quality are mandated at the federal, state, and local levels.

2.1 Federal Requirements

The primary federal level regulation of surface and groundwater quality is embodied in the Clean Water Act. Details are summarized in the sections below.

2.1.1 Clean Water Act

In 1972, the United States (US) government passed the Federal Water Pollution Control Act, which later came to be known as the Clean Water Act (CWA). This legislation, issued by the United States Environmental Protection Agency (US EPA), established the contemporary legal foundation and structure for regulating water quality throughout the US. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The list below summarizes some of its more important sections:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines for all surface Waters of the US.
- Section 401 requires an applicant for any federal project that proposes an activity that may result in a discharge to Waters of the US to obtain certification from the state that the discharge will comply with other provisions of the CWA. The Waters of the US include all navigable water bodies and all water bodies that drain into a navigable water body.
- Section 402 established the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredge or fill material) into Waters of the US. The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB) administer this permitting program in the State of California; later sections will discuss the NPDES in detail.
- Section 404 establishes a permit program for the discharge of dredge or fill material into Waters of the US. The United States Army Corps of Engineers (USACE) administers this permit program.

2.1.1.1 National Pollutant Discharge Elimination System (NPDES)

The NPDES Permit was established in the CWA to regulate municipal and industrial discharges to the surface Waters of the US. The ultimate objective of the CWA is zero pollutant discharge, but it also recognizes the need for a system to regulate non-zero pollutant discharges until the zero pollutant objective is feasible. Section 402 of the CWA established the NPDES for this purpose. The NPDES regulates all pollutant discharges, particularly point source discharges, to the Waters of the US.

The passage of the Water Quality Act (WQA) of 1987 amended the CWA to specifically include storm water discharges as a type of point source discharge, and to establish the framework for regulating municipal and industrial storm water discharges under the NPDES program. This amendment added storm water related discharges associated with construction projects to the list of discharges that require a NPDES Permit. This inclusion of storm water related discharge is why construction projects are subject to the requirements of the NPDES, why they and must satisfy the requirements of all applicable NPDES permits.

The allowable concentrations and mass emissions of pollutants are only set at a regional level. These set concentrations and mass emissions of pollutants are specifically allowed either through site-specific NPDES permits or through other regulatory mechanisms, such as Total Maximum Daily Loads (TMDLs).

Non-point pollution sources are defined as sources originating over a wide area rather than from a definable point. Non-point pollution often enters receiving water bodies in the form of surface water runoff, and is not conveyed by way of pipelines or discrete conveyances. As defined in federal regulations, non-point sources are generally exempt from the NPDES Permit program requirements. However, non-point source discharges caused by general construction activities are controlled by the NPDES program.

The goal of NPDES non-point source regulations is to improve the quality of storm water discharged into receiving waters, to the "maximum extent practicable," through the use of Best Management Practices (BMPs). BMPs can include the development and implementation of various practices, including: structural measures (i.e.., the construction of Biofiltration Strips/Swales, and detention basins); regulatory measures (i.e., local authority over drainage facility design); public policy measures (i.e., labeling of storm drain inlets to mitigate the impacts of dumping on receiving waters); and educational measures (i.e.., workshops informing the public of the impacts of household chemicals dumped into storm drains).

CWA Federal Regulations define "municipal separate storm sewer" to mean "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains): (i) owned or operated by a State, city, town , borough, county…". Pursuant to the CWA Section 402, NPDES Permits are required and issued for discharges from a Municipal Separate Storm Sewer System (MS4) serving a population of 100,000 or more for Phase I Regulations, and for serving a population of 10,000 or more for Phase II Regulations.

2.2 State Requirements

Contemporary water quality regulation began in the State of California with the Dickey Act, which was passed in 1949. The Dickey Act created the RWQCBs and the State Water Quality Control Board, which was later combined with the State Water Resources Board and became known as the SWRCB. In 1962, the State of California passed the

Porter-Cologne Water Quality Act, which provides the basis for contemporary water quality regulation in the state.

In the State of California, the SWRCB now administers water rights, water pollution control, and federal as well as state water quality functions throughout the state. Each of the SFBRWQCBs is responsible for the protection of beneficial uses of water resources according to federal, state and local regulatory requirements within its jurisdiction. Each uses planning, permitting and enforcement authorities to meet these responsibilities. In particular, the SWRCB administers statewide NPDES permits and the RWQCBs administer local NPDES permits.

2.2.1 Porter-Cologne Water Quality Act

The Porter-Cologne Act significantly expanded the mandate and authority of the SWRCB and RWQCBs to regulate water quality, including the requirement of a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the State.
The water laws state that the people of the State have the primary interest in the conservation, control, and utilization of the water resources of the State. These water laws also state that the quality of all the waters of the State shall be protected for the use and enjoyment of the people of the State. Such laws also regulate activities and factors that may affect the quality of waters of the State in order to attain the highest water quality reasonable, with consideration of all demands made and to be made on those waters and the total values involved (i.e., beneficial and detrimental, economic and social, tangible and intangible). Below is an excerpt from the Porter-Cologne Water Quality Act that illustrates this point:

> "The Legislature further finds and declares that the health, safety and welfare of the people of the state requires that there be a statewide program for the control of the quality of all the waters of the state; the state must be prepared to exercise its full power and jurisdiction to protect the quality of waters in the state from degradation originating inside or outside the boundaries of the state; the waters of the state are increasingly influenced by inter-basin water development projects and other statewide considerations. The Legislature finds that the factors of precipitation, topography, population, recreation, agriculture, industry, and economic development vary from region to region within the state, and that the statewide program for water quality control can be most effectively administered regionally within a framework of statewide coordination and policy" (Porter-Cologne Water Quality Act, Chapter 1, Pg. 1, January 2006).

2.3 NPDES Permits Applicable to the EWC Project

Storm water discharges from the two cities within the EWC Project are covered under the Alameda Countywide Clean Water Program (ACCWP). A small portion of the EWC Project is within Caltrans' R/W and is covered under the Caltrans' NPDES Permit.

2.3.1 Alameda Countywide Clean Water Program (ACCWP)

The ACCWP was established in 1991. The ACCWP NPDES Permit covers 14 cities, three county agencies, two flood control districts, and the unincorporated area within Alameda County. The ACCWP is committed to coordinating and supporting the work required to implement their NPDES Permit (No. CAS0029831). The Alameda County Permit also requires compliance with the requirements of the Statewide Construction General NPDES Permit No. CAS000002.

The ACCWP has requirements for urban new development and re-development projects. Such requirements are defined in section C.3 of the ACCWP's Permit. Under the C.3 provisions of the ACCWP, permanent control measures are required measures that were developed to reduce the long-term impacts of the land development on storm water quality and creek channels.

To differentiate from temporary measures controls (used to only control sedimentation and erosion during construction of a project); the ACCWP Program refers to the permanent control measures such as post-construction storm water controls or post construction BMPs. The post-construction storm water control measures consist of four groups: 1) site design measures; 2) source control measures; 3) storm water treatment measures; and 4) hydromodification management measures. Further examination into these BMPs is provided below:

1) Site design measures are defined as site planning techniques that should be able to help reduce storm water pollutants and increase peak runoff flow and duration. The site design measures protect existing natural resources and reduce impervious surfaces of development projects.

2) Source control measures entail structural project features or operational "good housekeeping" practices that prevent pollutant discharge and runoff at the source, and prevent contaminants or pollutants from combining with storm water.

3) Storm water treatment measures are engineered designed systems that withdraw pollutants from storm water, simulating natural processes like filtration, infiltration, flotation, and sedimentation. Storm water treatment measures are required to be sized hydraulically in accordance with the municipal storm water permit's C.3 Provision criterion. There are two classifications of storm water treatment measures: landscape-based or non-landscape based. Landscape-based storm water treatment measures have been proven more effective than the later and, therefore, have been encouraged.
Storm water treatment measures consist of the following:

- Bioretention areas
- Extended detention basins
- Flow-through planter boxes

- Infiltration trenches
- Media filters
- Tree well filters
- Vegetated buffer strips, and
- Vegetated swales

4) Hydromodification management measures are site design and source control measures that support infiltration and minimize the change in the runoff rate of flow in combination with pre-development conditions. Hydromodification management measures consist of the following:

- Basins
- Ponds
- Vaults

C.3 Provision of the ACCWP introduced thresholds for development and redevelopment projects in accordance with such provisions. These thresholds are based on the amount of impervious surface that is created and/or replaced. The threshold is 10,000 ft^2 or more, unless an applicable development permit application was submitted.

2.3.2 Caltrans NPDES Permit

Caltrans, as the owner of an MS4, has its own Statewide NPDES Permit. The Caltrans NPDES Permit is under Permit No. CAS000003, adopted July 15, 1999 to cover all Caltrans projects and facilities in the state. The Caltrans' Permit also requires compliance with the requirements of the Statewide Construction General NPDES Permit.

2.3.3 Other Local Requirements

The EWC Project is within the jurisdiction of Alameda County Flood Control and Water Conservation District (ACFC & WCD). The ACFC & WCD protects the western Alameda County residents and property from flooding, while preserving the natural environment. The ACFC & WCD flood control includes infrastructure such as channels, pump stations, and other facilities. The ACFC & WCD is composed of ten "Zones" and the Tule Ponds neighborhood. Zone 5 covers watersheds from Fremont and Hayward hills to the shoreline of the San Francisco Bay. Zone 3A covers creeks that flow from the hills east of California State University, and the East Bay to the City of Hayward including the City of Union City. The EWC Project is within Zone 5 and Zone 3A of the ACFC & WCD flood protection's jurisdiction.

3 AFFECTED ENVIRONMENT/EXISTING CONDITIONS

3.1 Study Area

The study area for this Water Quality Study report is within the South Bay Hydrologic Unit and the Alameda Creek Hydrologic Area. The EWC Project limits are restricted to the construction area.

3.2 Study Methods and Procedures

The methods and procedures considered for the development of this report are the federal, state, and local water quality laws and regulations relevant to the EWC Project study area. These laws and regulations are the CWA, California's Porter-Cologne Water Quality Control Act, and Alameda County regulations.

Water quality related permits at the statewide level for the EWC Project were also studied and addressed in this report (e.g., the ACCWP, the Caltrans' NPDES statewide Permit, and Construction General Permit for construction and dewatering). SFBRWQCB's water quality laws of the were addressed, such as laws pertaining to water resources designated as beneficial uses and to water quality objectives, in this study. The SFBRWQCB established a Basin Plan with goals and policies that applies to the region water resources regarding beneficial uses and water quality objectives.

As part of this Water Quality Study, the EWC Project team reviewed existing topography data from the City of Fremont Flood Insurance Study (FIS), the Ecologic Regions of California, the *Phase I Environmental Site Assessment Report*, Draft Biological Resources Study, the United States Geological Survey (USGS), subsurface soils, groundwater depth, soils permeability and drainage were obtained from the *Geologic and Seismic Report* and hydrology and surface streams information from the Federal Emergency Management Agency (FEMA) composed FIS Report. Existing groundwater was evaluated using the California Department of Water *California's Groundwater Bulletin*. Biotic and aquatic habitat locations specific to the EWC Project were obtained from the Biologic Resource Study that was prepared for the EWC Project.

3.3 General Water Resources Setting

The EWC Project is bounded by Mission Boulevard on the northwest, the Quarry Lakes Park on the east, Decoto Road on the west, and I-880 on the southwest. Approximately 3.0 mi of the EWC Project, dominated by the City of Fremont and City of Union City streets, is surrounded by residential, commercial, industrial, open space, civic, public, and vacant land. The EWC Project has four receiving water bodies including the following: 1) the ACFCC; 2) Old Alameda Creek; and 3) Line M Channel . There are also two indirect receiving water bodes that are not within the EWC Project limits but are near the EWC Project, (Crandall Creek and Dry Creek).

3.3.1 Topography

The soil within the City of Fremont is primarily formed from alluvial coast strata. The City of Fremont consists mainly of grass-covered hills on the north and east side of the city. Elevations range from sea level to 2,517 ft at Mission Peak (FEMA, 2000). The City of Union City is located on sensitive wetlands on the west, and on a hilly area on the east. This area is limited for development because of the sensitive wetlands and hilly area (Ecological Subregions of California, 2008).

3.3.2 Soils, Geology, and Depth to Water Table

A *Geologic and Seismic Report* was prepared for the EWC Project by Parikh Consultants, Inc. (August, 2008). Based on the Geologic Map presented in the Report, subsoils of the EWC Project site consists mainly of Basin Deposits [Geologic Unit (GU) Qhb; Holocene], Natural Levee Deposits (GU Qhl; Holocene), and Alluvial and Fluvial Fan Deposits (GU Qhaf; Holocene). Specifically, north of the alignment the EWC Project subsurface subsoils are predominantly clay underlain by sand and gravel material.

South of the EWC alignment, i.e., towards the south of Decoto road, the subsoils are Alluvial Terrace Deposits (GU Qhfp; Holocene). These soils are composed of clayey silt to sandy/silty clay material.

Along the banks of Old Alameda Creek and the ACFCC, the subsoils are Natural Levee deposits (GU Qhl; Holocene). These soils have high porosity and permeability; therefore, these soils have high infiltration capacity.

The descriptions of the soils mentioned above are listed in the *Geologic and Seismic Report*.

A water table is defined as the upper surface of groundwater where the water is at atmospheric pressure. More specifically, “water table” refers to a saturated zone in the soil that occurs during a certain month. Estimates of the upper limit of the water table are based on observations of the water table at select sites and on the evidence of a saturated zone, such as grayish colors (or redoximorphic features) in the soil.

A saturated zone that lasts less than a month is not considered a water table (NRCS Web Soil Survey, June 2008). The *Geologic and Seismic Report* provided the groundwater information for this report. According to the *Geologic and Seismic Report*, groundwater was encountered at Elevation +12.0 to +27.0 ft (Depth of 23.0 ft to 34.0 ft). However, the report also stated that groundwater levels may have varied over the course of time, because of the following reasons: groundwater fluctuates each season, surface and subsurface flows may vary, groundwater run-off may vary, and the water level from nearby creeks may change.

3.3.3 Erosion Potential

The *Geologic and Seismic Report*, prepared by Parikh Consultants, Inc. for the EWC Project, provided erosion and sedimentation information (August 2008). Erosion potential at the Project site was evaluated based on soil group classifications obtained from the USDA NRCS and Web Soil Survey. The soils in the Project vicinity are mainly silt to silt clay loam, with moderately low to moderately high permeability; they are classified as poorly drained to well drained. The EWC Project area native soils, and their impact from drainage and permeability standpoint, are listed in the following table.

Table 1. Drainage and Permeability Impacts for underlying Native Soils

Soil Unit	Map Unit Name	Surface Texture	Permeability	Slope (%)	Drainage
DaB	Danville Loam	Silty Clay Loam	Moderately low to moderately high	10	Well Drained
107	Clear Lake	Clay	Moderately low to moderately high	0-2	Poorly Drained
111	Danville Loam	Silty Clay Loam	Moderately low to moderately high	0-2	Well Drained
131	Omni Loam	Silty Clay Loam	Moderately low to moderately high	-	Poorly Drained
135	Pits	Gravel	-	-	-
143	Sycamore Loam	Silt	Moderately high to high	-	Poorly drained
161	Yolo Loam	Silt	Moderately high to high	0-2	Well Drained

Source: Parikh Consultants, Inc.

3.3.4 Climate and Precipitation

The City of Fremont's climate is oceanic; the mean annual temperature is 59ºF with a maximum annual average of 68ºF and a minimum of 47ºF (FEMA, 2000).
The City of Union City has a mean high annual temperature of 79.6 ºF, and a mean low annual temperature of 43.6 ºF (Fizber, 2008). The average rainfall in California is variable and inconsistent from region to region. The rainy season for the Project is October 15th through April 15th (Caltrans, 2003).

3.3.5 Regional Hydrology

The Project is located within the San Francisco Bay Hydrologic Region, which is divided into seven hydrologic units. The Project falls within the South Bay Hydrologic Unit which is further divided into four sub regions or Hydrologic Areas. Specifically, the Project falls within the Alameda Creek Hydrologic Area (California Watershed Portal, Access Website Date: May 2008). The Alameda Creek Hydrologic Area has a watershed

size of 404,764 ac and an annual average annual rainfall of 20.4 in. (California State University Sacramento, Access Website Date: May 2008).

3.3.6 Population and Land Use

The Project is located in Alameda County, within the City of Fremont and the City of Union City. According to the 2003 United States Census Bureau, the City of Fremont has an estimated population of 204,525 people, while the City of Union City has an estimated population 69,309 people.

The City of Fremont land use consists of retail, office, commercial mixed-use (retail and office), industrial, residential multi-family and single-family, open space, civic/public use, and vacant areas. Union City has land use designations that consist of residential, commercial (station mixed use and retail commercial), visitor and thoroughfare commercial, office commercial, and industrial.

3.4 Existing Surface Water Resources Environment

Surface water resources near and along the EWC Project limits include creeks, lakes, and the San Francisco Bay.

3.4.1 Surface Streams

The major receiving water bodies for the EWC Project are the ACFCC, Old Alameda Creek, and Line M Channel that ultimately flows into the San Francisco Bay.

The proposed EWC Project alignment would cross Old Alameda Creek at two separate locations (shown as Bridge Crossing 1 and Bridge Crossing 2 in Figure 2). The alignment 300 of the EWC Project also crosses the ACFCC (Line A) east of the Paseo Padre Parkway (see Figure 2). The creek crossings would be constructed as three separate concrete bridges supported by abutments and/or intermediate piers. The new alignment would also pass over the Line M Channel. Approximately 1,100 ft of the Line M Channel would be replaced by double 10 ft by 5 ft box culverts.

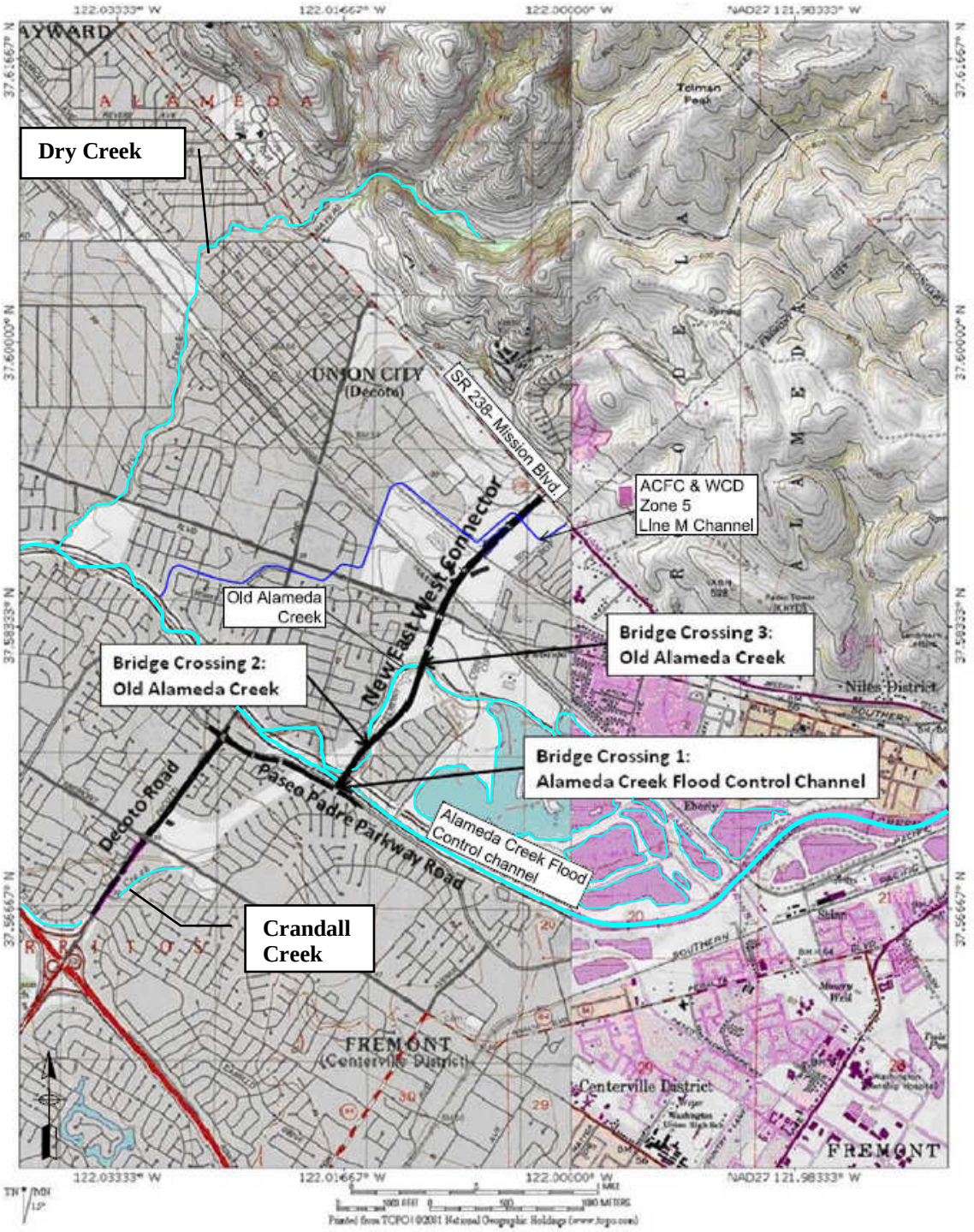


Figure 2. Creek and Channel Crossings Map

Source: USGS

3.4.2 Beneficial Uses of Receiving Water Bodies

Beneficial uses of receiving water bodies are critical to water quality management in California. According to the San Francisco Bay Regional Water Quality Control Board's (SFBRWQCB) Basin Plan, the State's water policy is directed towards achieving the highest water quality while maximizing the benefit of the people of California. Aquatic ecosystems and underground aquifers offer various benefits to the people of California. Beneficial uses characterize the resources, services, and qualities of these aquatic systems. Beneficial uses are the ultimate goals of protecting and achieving high water quality. The SFBRWQCB is responsible for protecting these uses from pollution and nuisances that may occur as a result of waste discharge in the region. Beneficial uses are the basis for creating water quality objectives and discharge prohibitions for groundwater, marshes, and mudflats.

According to the SFBRWQCB's Basin Plan, Alameda Creek Quarry Ponds and Alameda Creek and its tributaries have the following existing beneficial uses:

Alameda Creek Quarry Ponds:

- Groundwater Recharge (GWR): an existing beneficial use for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers

- Cold Freshwater Habitat (COLD): an existing beneficial use that supports cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates

- Warm Freshwater Habitat (WARM): an existing beneficial use that supports warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates

- Water Contact Recreation (REC-1): an existing beneficial use of water for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, and uses of natural hot springs

- Noncontact Water Recreation (REC-2): an existing beneficial use for recreational activities involving their proximity to water, but not normally involving contact with water where water ingestion is reasonably possible. Uses include, but not limited to, picnicking, sunbathing, hiking,

beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities

Alameda Creek and its tributaries:

- Agricultural Supply (AGR): existing beneficial use for inland surface waters that support or could support most of the present and potential beneficial uses

- Fish Migration (MIGR): existing beneficial use that supports habitats necessary for migration, acclimatization between fresh water and salt water, and protection of aquatic organisms that are temporary inhabitants of waters within the region

- Fish Spawning (SPWN): existing beneficial use that supports high quality aquatic habitats suitable for reproduction and early development of fish

- Wildlife Habitat (WILD): existing beneficial use of waters that support wildlife habitats, including but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl

- REC-1, REC-2; GWR, COLD, and WARM

3.4.3 Water Quality Objectives

The SFBRWQCB's Basin Plan lists water quality objectives for surface waters of the region. These Surface Water Quality Objectives consists of the following:
Bacteria (bacterial water quality objectives); Bioaccumulation; Biostimulatory Substances; Color; Dissolved Oxygen; Floating Material; Oil and Grease; Population and Community Ecology; pH; Radioactivity; Salinity; Sediment; Settable Matter; Suspended Material; Sulfide; Tastes and Odors; Temperature; Toxicity; Turbidity; and Unionized Ammonia.

The SFBRWQCB's Basin Plan list water quality objectives for the region in Chapter 3 of the Plan (see Appendix A).

Table 2. Surface Water Quality Objectives for the Project

Surface Water Quality Objectives (Alameda Creek and Tributaries)	
TDS*:	250 mg/l (90 day-arithmetic mean)
	360 mg/l (90 day-90th percentile)
	500 mg/l (daily maximum)
Chlorides:	60 mg/l (90 day-arithmetic mean
	100 mg/l (90 day-90th percentile)
	250 mg/l (daily maximum)

Source: SFBRWQCB

* TDS: Total Dissolved Solids

3.4.4 Existing Surface Water Quality and Sensitivity

Section 303(d) of the CWA mandates to all states to develop a list of water bodies that do not meet the water quality standards after technology-based limits were implemented to these specific water bodies. These water bodies that are found in the *CWA Section 303(d) List of Water Quality Limited Segments,* also known as the CWA Section 303(d) List, and are classified as impaired water bodies. The states with impaired water bodies are required to develop TMDLs to address these impairments.

Alameda Creek and its tributaries are listed in the CWA Section 303(d) List as impaired for Diazinon. According to the CWA Section 303(d) List, the potential sources of pollution are urban runoff and storm sewers. The list was approved by the US EPA on June 28, 2007. The impaired water bodies requiring TMDLs on this list are being addressed by the US EPA and are also approved or are being addressed by actions other than TMDLs. Alameda Creek and its tributaries are impaired water bodies being addressed by non-TMDLs actions.

The SFBRWQCB Surface Water Ambient Monitoring Program (SWAMP) has a Regional Monitoring and Assessment Strategy (RMAS) to deliver information for all water bodies in the region for the report. Every state is required to submit a similar report to the US EPA according to the CWA Sections 305(b) and 303(d). At this time, the SWAMP is a relatively new program, and field monitoring activities began in FY 2001-2002. SWAMP focuses on primarily site-specific monitoring because of budget limitations.

3.5 Existing Groundwater Resources Environment

The following sections present information about the existing groundwater within the EWC Project limits. Figure 3 is an excerpted groundwater map of the San Francisco Bay Hydrologic Region.

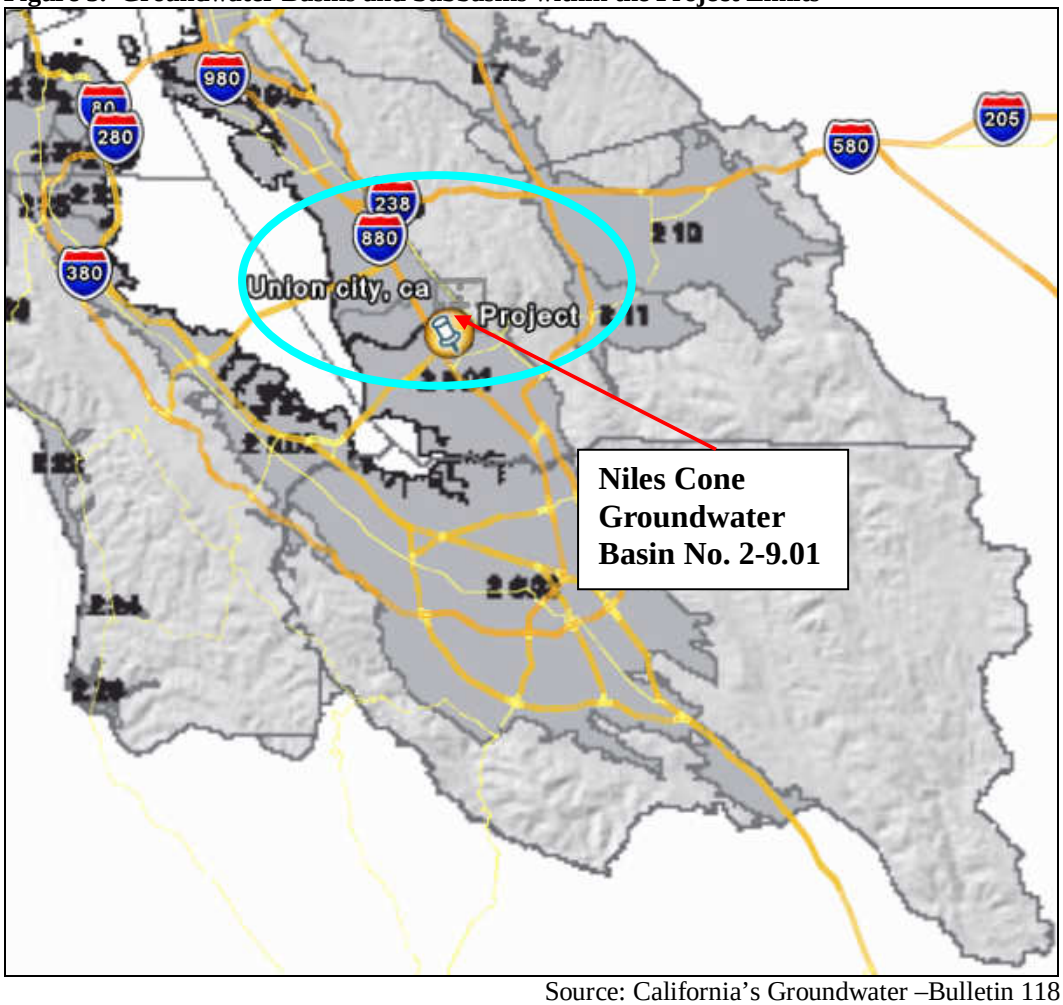
3.5.1 Study Area and Recharge Areas

The EWC Project is within the San Francisco Bay Hydrologic Region, which covers approximately 2.88 million ac (4,500 mi²). Groundwater is an important water supply and

the San Francisco Bay Hydrologic Region has 28 recognized groundwater basins that lie behind approximately 896,000 ac, or about 30 percent, of the entire hydrologic region. Freshwater-bearing aquifers are moderately thick in the more greatly utilized basins; however, the EWC Project is not located in a moderately thick groundwater basin.

The Project lies on the Niles Cone groundwater subbasin. See Figure 3 for a depiction of the location of the Project relative to the groundwater basins.

Figure 3. Groundwater Basins and Subbasins within the Project Limits



Source: California's Groundwater –Bulletin 118

3.5.2 Objectives for Groundwater Quality and Local Groundwater Constituents

Groundwater Quality Objectives for the Alameda Creek and its tributaries above Niles Cone Basin are listed in Table 3-7 of the Basin Plan, entitled "Water Quality Objectives for the Alameda Creek Above Niles**," which is included in Table 3 of this report.

Table 3. Groundwater Quality Objectives for the Project

Groundwater Quality Objectives for the Alameda Creek Above Niles (Concentration not to exceed more than 10 percent of the time during one year.)**	
Central Basin	
TDS:	Ambient or 500 mg/l, whichever is lower
Nitrate (NO3):	45 mg/l
Fringe Subbasins	
TDS:	Ambient or 1000 mg/l, whichever is lower
Nitrate (NO3):	45 mg/l
Upland and Highland Areas	
NOTE: California domestic water quality standards set forth in California Code of Regulations, Title 22, and current county standards	
*Ambient water quality conditions at proposed project area will be determined by Zone 7 of the Alameda County Flood Control and Water Conservation District at the time the project is proposed, with the cost borne by the project proponents. Ambient conditions apply to the water-bearing zone with the highest quality water. Waters designated for use as domestic or municipal water supply shall not contain concentrations of chemicals in excess of natural concentrations or the limits specified in California Code of Regulations, Title 22, Chapter 15, particularly Tables 64431-A and 64431-B of Section 64431, Table 64444-A of Section 64444, and Table 4 of Section 64443. ** As stated in the SFBRWQCB Basin Plan, there is no reference as to what is "Niles"	

Source: SFBRWQCB

3.5.3 Existing Groundwater Quality and Sensitivity

A *Phase I Environmental Site Assessment Report*, prepared by Fugro West, Inc. for the EWC Project included information on subsurface soil and groundwater. The EWC Project would involve soil disturbance within the street right-of-ways and encounter subsurface groundwater. Therefore, a Soil and Groundwater Management Plan was recommended for the EWC Project team to address potential impacts during construction.

3.5.4 Niles Cone Groundwater Basin

The ACWD has jurisdiction over the Niles Cone Groundwater Basin recharge water. The ACWD accounts for 15 percent of the total water supply, which is used to recharge the aquifers of the Niles Cone Groundwater Basin. This basin supplies water from the South Bay Aqueduct, through Alameda Creek and its tributaries, and into the ACFCC. More specifically, the water is supplied to this basin by percolation from the diverted water to the Quarry Lakes. The ACWD extracts water from the groundwater basin via 16 wells and produces 47.5 million gallons per day (MGD).

The Niles Cone Groundwater Basin is protected through the ACWD groundwater management protection programs.

The Niles Cone Groundwater Basin consists of an alluvial aquifer system that is made up of unconsolidated gravel, sand, silt, and clay. Gravel and sand deposits have high permeability where silt and clay layers have low permeability and form aquitards. The Niles Cone Groundwater Basin is located on the Hayward Fault, an active fault with low permeability that impedes the lateral flow of groundwater (ACWD, January 29, 2008).

The EWC Project lies on a non-permeable sediments aquifer. The aquifer is composed of a series of relatively flat lying aquifers separated by extensive clay aquitards. According to the Groundwater Monitoring Report, the shallowest regional aquifer in the Below Hayward Fault (BHF) subbasin is the Newark Aquifer, which is an extensive permeable gravel and sand layer between 40 ft and 140 ft below the ground surface (see Figure 4).

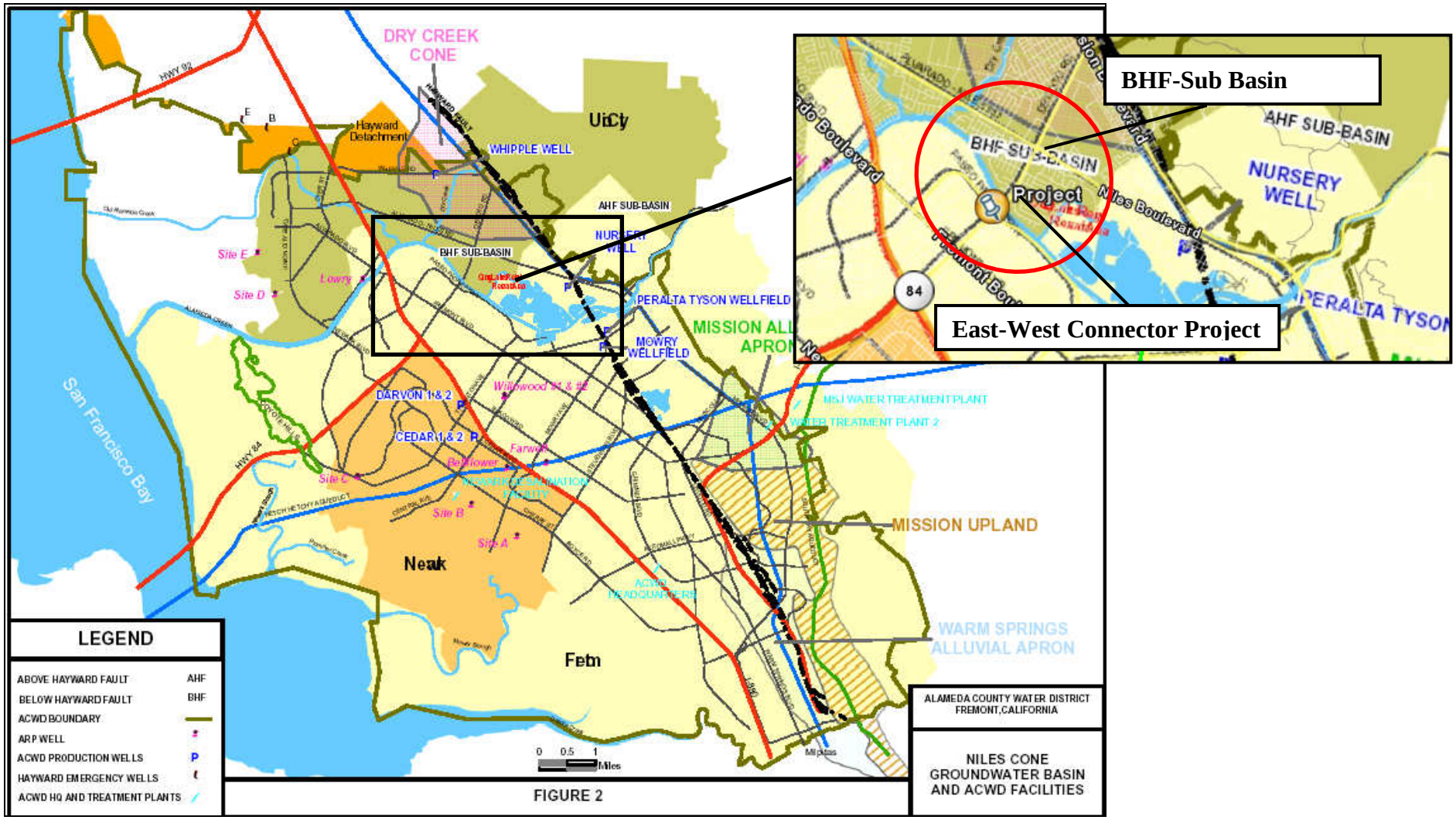


Figure 4. Niles Cone Groundwater Basin and ACWD Facilities

Source: ACWD

3.6 Biotic/Aquatic Considerations

A *Draft Biological Resources Study* was prepared for the EWC Project (ICF Jones & Stokes, July 2008). The study included information on biological resources and habitats that may support special-status species along the EWC Project limits, and on portions of ACFCC and Old Alameda Creek that are not directly within the alignment footprint. The majority of the sensitive biological resources that may be affected by the EWC Project are located within the Historic Parkway Alignment from Mission Boulevard, at the northeast end of the alignment, to the southeast at the Paseo Padre Parkway. According to the *Draft Biological Study Report*, since the vegetation is diverse and moderately developed, the riparian forest/vegetation offers high-value habitat for wildlife. The riparian forest/vegetation habitat offers food, water, migration and dispersal corridors, escape, nesting, and thermal cover for wildlife. The Study also names existing wetlands that are present within the Biological Study Area. Herbaceous Wetlands (also known as freshwater emergent wetlands or marsh) are present in the historic Old Alameda Creek, ACFCC, and the Line M Channel. These Herbaceous Wetlands are subjugated by emergent hydrophytes, but ruderal species are also present. Various wildlife species depend on Herbaceous Wetlands and aquatic channels for valuable food, water nesting, escape, thermal cover, and migration and dispersal corridors.

4 ENVIRONMENTAL CONSEQUENCES AND PROJECT IMPACTS

The following sections present potential temporary and permanent water quality impacts anticipated from the proposed EWC Project activities, and the following discussion includes the ACCWP procedures for identifying potential impacts.

4.1 Temporary Impacts to Water Resources

During construction, the EWC Project has the potential to temporarily impact the water quality of jurisdictional biotic/aquatic (wetland) areas of the Waters of the US and the State. Potential temporary impacts can occur to the USACE, and California Department of Fish and Game biotic/aquatic (wetland) areas. These impacts may change the Waters' chemical and biological compositions. Temporary impacts to water resources can be created from stream and streambed diversions.

These temporary impacts can be a result of temporary stream diversion installation and removal, streambed disturbance during culvert removal, and bridge construction and replacement, vegetation removal, and road construction. Temporary water quality impacts due to grading activities would be addressed with temporary BMPs.

According to the *Draft Biological Resources Study* prepared for the Project by ICF Jones & Stokes, temporary impacts due to the encroachment on jurisdictional wetlands and waters during construction are a result of construction and access (July 2008).These temporary impacts calculations are currently being estimated and will be included in this report when they become available.

4.2 Temporary Impacts to Groundwater

The proposed EWC Project improvements include creating a major depressed roadway requiring excavation to approximately 28 ft below the existing ground surface. New footings are proposed for the widening or reconstruction of bridges.

Dewatering may not be needed for the EWC Project improvements since there will be retaining walls near the underpass structure, which would require excavations of a depth of 30 ft below ground. However, the groundwater conditions for the EWC Project may be impacted since the ACWD requires that a minimum amount of soil cover over the aquifer zone. According to the *Geologic and Seismic Report*, the geotechnical information and groundwater data present a construction option to build a system of concrete structural mat and retaining walls known as a "boat slab" (Parikh Consultants, Inc., August 2008).. Such a boat slab would require a pile foundation system. Another design option for the EWC Project may be the use of a Deep Soil Mix (DSM) type of wall system around the perimeter of the excavation that would restrict the groundwater flow across the excavation foot print. The DSM system is below ground soil-cement wall, which reduces water in-flow into the excavation.

4.3 Temporary Impacts to Storm Water

During construction, the EWC Project Build Alternative would have a potential for temporary water quality impacts due to grading activities and removal of existing vegetation, which can cause increased erosion. Storm water runoff from the EWC Project site may transport pollutants to nearby creeks and storm drains if temporary BMPs are not properly implemented. Storm water runoff draining into the receiving water bodies will eventually discharge to the San Francisco Bay. Generally, as the Disturbed Soil Area (DSA) increases, the potential for temporary water quality impacts also increases. The EWC Project has an estimate of 55.69 ac of DSA. Based on these preliminary calculated areas, the EWC Project would have potential water quality impacts during construction.

Fueling or maintenance of construction vehicles may occur within the EWC Project site during construction so there is risk of accidental spills or release of fuels, oils, or other potentially toxic materials. An accidental release of these materials may pose a threat to water quality if contaminants enter storm drains, open channels, or surface water receiving bodies. The magnitude of the impact from an accidental release depends on the amount and type of material spilled.

4.4 Permanent Impacts to Water Resources

The EWC Project would have permanent impacts on jurisdictional wetlands and Waters of the US due to proposed permanent filling within existing water resources. In addition, the removal of riparian vegetation and stream bank modification can lead to increased erosion. The EWC has the potential to cause permanent impacts to the jurisdictional areas of the USACE, California Department of Fish & Game, and the SFBRWQCB. The permanent impacts include: loss of biotic/aquatic (wetland) areas serving important water quality or water resources functions, changes to the stream bank configurations, and loss of riparian habitat of the existing waterways. These potential permanent impacts are from the results of road widening, bridge construction, miscellaneous construction, realignment of existing roadways, construction of new road sections, and/or additional discharge of storm water.

Permanent impacts due to dredging or fill in Waters of the State or US shall be mitigated and referenced in the Draft Biological Resources Study, prepared for the Project, by ICF Jones & Stokes (July 2008).

The *Draft Biological Resources Study* had estimates, in acres, of permanent jurisdictional wetlands and waters impacts. The total acreage of permanent loss of wetlands and other waters of the United States was found to be 1.47 acres, and the total acreage of potential waters of the State was 2.85 acres. Detailed information for the specific locations, names of waters and wetlands can be found in the *Draft Biological Resources Study*.

4.5 Permanent Impacts to Groundwater

Minimal permanent impacts to groundwater are anticipated since the EWC Project is not proposing to excavate deeper than 40 ft. Therefore, the EWC Project would not affect the

shallowest aquifer in the Niles Cone aquifer. Excavation work would mostly consist of construction of the roadbed and the depressed section. The depressed section would be lined to protect it from the water table. The existing groundwater recharge areas may be affected by the EWC Project due to the increase in impervious area, thus reducing the amount of areas available for infiltration. A pump is proposed that will collect all the proposed EWC Project surface roadway area runoff, from the depressed roadway. This runoff will receive storm water treatment to the MEP. Therefore, there are no permanent impacts anticipated from the proposed EWC Project.

4.6 Permanent Impacts to Storm Water

The FHWA performed studies showing that runoff from streets and highways have the potential to affect receiving water quality. The nature of these impacts would depend on the uses and flow rate or volume of the receiving water, rainfall characteristics, and street or highway characteristics. Heavy metals associated with vehicle tire and brake wear, oil and grease, and exhaust emissions, are the primary pollutants associated with transportation corridors.

The EWC Project would increase impervious areas and would potentially increase the volume and velocity of the storm water runoff to downstream receiving water bodies. The additional runoff generated by this development could cause storm runoff to flow at a faster rate (due to a higher runoff coefficients), which may result in erosion of creek beds, siltation, and/or flooding or loss of aquatic habitat. If appropriate water pollution control measures are not implemented, pollutant loading and erosion potential may increase, causing permanent impacts to storm water quality.

The ACCWP, under its NPDES Permit, requires the following:

- Projects that create or replace 10,000 sq ft or more of impervious surface area should include storm water treatment measures

- Projects that create or replace 1 ac or more of impervious surface area in hydromodification susceptible areas (See Appendix F, ACCWP's Hydromodification Susceptibility Map) should include hydrograph modification measures

Approximately 19.10 ac for Union City, 6.55 for City of Fremont, and 0.17 ac for Caltrans which equates to a total of 25.82 ac of impervious area would be added from the Project: thus both treatment and hydromodification measures would be necessary. The objective of the Project is to implement integrated best management practices (IMPs) that would serve both the hydromodification management and storm water treatment qualifications needed to address the EWC Project's impacts. In addition, the EWC Project's design goal is to maintain pre-construction storm water discharge flows by metering or detaining these flows to pre-construction rates prior to discharge to a receiving water body or to an MS4 system. By meeting this design goal, permanent water quality impacts are expected to be less than significant.

5 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The EWC Project team has evaluated a number of alternatives and is focused on an alternative that considers avoiding and/or minimizing environmental impacts, while maintaining the EWC Project's need and purpose. This EWC Project would have less than significant impacts to water quality with the following avoidance, minimization, and proposed mitigation measures incorporated.

5.1 Avoidance and/or Minimization Measures for Water Resources

Avoidance measures for the EWC Project would be evaluated through consultation with local and regulatory agencies. There are wetlands and Waters of the US and State within the EWC Project limits that are anticipated to be impacted. Measures to minimize impacts to these wetlands and waters will be implemented upon consultation with regulatory partners and subsequent design modifications. The EWC Project would maximize the avoidance of Environmentally Sensitive Areas (ESAs) that exist within or adjacent to the Project limits. Delineation of these areas can be achieved through field verification. Once verified, these locations would be delineated on all EWC Project contract plans.

In addition, all proposed construction work in jurisdictional areas will be scheduled per regulatory construction windows to minimize impacts.

5.2 Avoidance and/or Minimization Measures for Storm Water and Groundwater

The overall design features for water quality impacts is a condition of the ACCWP with the SWRCB. Implementation of details for these design features or BMPs will be developed and incorporated into the EWC Project design and operations, prior to the EWC Project startup. With proper implementation of these design features or BMPs, short-term construction-related water quality and permanent water quality impacts would be avoided or minimized.

5.2.1 Project Construction

Since the EWC Project will involve a potential soil disturbance of more than 1 ac, a Notification of Intent under the Alameda County NPDES Permit will need to be filed with the SFBRWQCB. The ACCWP requires its contractors to implement a Storm Water Pollution Prevention Plan (SWPPP) to comply with the conditions of the Permit, and to address the temporary water quality impacts resulting from the construction activities associated with this Project.

The SWPPP should be submitted by the contractor and approved by the ACCWP prior to the start of construction. It is intended to address construction-phase impacts. The SWPPP required for this Project would include a list of proposed temporary construction site BMPs.

5.2.2 List of Proposed Temporary Construction Site BMPs

The ACCWP has a list of construction storm water controls for active construction sites. These construction BMPs are sediment and erosion control and other construction-phase BMPs, which prevent erosion and can keep sediments and other pollutants out of the storm drain system and local creeks.

Temporary Erosion and Sediment Control Measures are listed as follows:

- Jute Netting/Fiber Blankets
- Mulch
- Hydroseed/Soil Binders/Compost Blankets
- Earth Dikes/Drainage Swales
- Check Dams
- Stabilized Construction Entrance
- Dust Control
- Street Sweeping
- Dewatering System
- Fiber Rolls/Wattles/Compost Socks
- Silt Fences/Compost Berms
- Sedimentation Basin
- Inlet Filters (bags, sand, and gravel)

Site Materials Handling and Storage or construction BMPs include the following:

- Construction Materials (wood, cement, etc.)
- Petroleum Products (oil, fuel)
- Hazardous Materials (paint, solvents)
- Concrete Washout Area
- Waste Systems
- Soil Stockpiles
- Vehicle Servicing
- Sampling, if required

Preservation of Existing Vegetation used under construction BMPs are:

- Mark Areas to be Preserved
- Tree Protection Fencing

5.2.3 Post Construction Storm Water Controls (BMPs/IMPs)

Post-construction storm water controls would be proposed for the EWC Project. These measures would consist of BMPs for storm water treatment or integrated management practices (IMPs) that are dual-use measures to address storm water treatment and hydromodification management measures. They consist of the following four groups: 1) site design measures; 2) source control measures; 3) storm water treatment measures; and, 4) hydromodification management measures. Storm water treatment measures, which also may be used as hydromodification management measures for the Project, include infiltration basins and Tree Well Filters. Tree Well Filters were considered in areas with limited space to incorporate the preferred vegetated based storm water treatments. The design of the Tree Wells is being discussed with the cities to address the water quality criteria. The basins and Tree Well Filters would be designed so that runoff discharge rates and durations matched the pre-project discharge rates and durations; from 10 percent of the pre-project 2-year peak flow, up to the pre-project 10-year peak flow. Potential proposed locations for the post-construction storm water controls for the EWC Project are attached in Appendix D of this study.

5.2.3.1 Infiltration Basins

Infiltration devices are basins or trenches that store runoff and allow it to infiltrate into the ground. Infiltration devices prevent pollutants from reaching surface waters. Preliminary soil data from the NRCS shows that soil at the proposed infiltration basin locations may be within the HSG B classification, which has medium to high infiltration rates. Other design criteria for the infiltration basins, such as having separation of at least 10 ft between the groundwater elevation and basin invert and 100 ft distance from water supply wells, were also met at these sites.

It is important to note, that it would be necessary for the Project Team to perform in situ soil tests in order to obtain more accurate hydrologic soil group data at the proposed IMP locations.

5.2.3.2 Tree Well Filters

Tree Well Filters are pre-cast concrete boxes with a small tree or shrub planted in a filter media. Storm water runoff flows into the box with the filter media and treated water would then be discharged to an underdrain system. A minimum of four Tree Well Filters would be used for hydromodification management along the new roadway alignment and 15 Tree Well Filters for storm water treatment along Decoto and the Paseo Padre Parkway.

5.3 Water Quality Assessment Checklist

This Water Quality Assessment Checklist is a summary of the storm water quality evaluation process, which is presented here in the State of California Environmental Quality Act (CEQA) Environmental Checklist Form.

The following is a list of questions from the Hydrology and Water Quality Checklist, which can be found in Section 8 of the California CEQA Checklist Form. The variety of possible answers include: "Potentially Significant Impact," "Less than Significant with Mitigation Incorporated," "Less than Significant Impact," and "No Impact."

Would the Project:

a) *Violate any water quality standards or waste discharge requirements?*

Less than Significant Impact

The potential primary impacts to water quality are eroded soil or suspended solids being introduced into the waterways. The EWC Project shall be regulated under ACCWP's NPDES Permit and Caltrans' General NPDES Permit.

Per these NPDES permits, water quality pollution minimization measures would include items such as: requiring the contractor to submit a SWPPP prior to start of construction and implementing site design measures, source control measures, storm water treatment measures, and hydromodification management measures. The proposed EWC Project would comply with all water quality standards and waste discharge requirements, thus the impact to water quality would be less than significant.

b) *Substantially deplete groundwater supplies or interfere substantially with ground water recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?*

Less than Significant Impact

Groundwater recharge is reduced when the ground is compacted, or when it is covered with impervious material, so that less water can seep into the soil. The additional impervious area from the EWC Project is small relative to the groundwater basin drainage size located within the EWC Project limits; therefore, groundwater recharge impacts would be insignificant for the EWC Project. In addition, implementing permanent Treatment BMPs to the MEP, such as infiltration basins, would also promote infiltration within the EWC Project limits.

c) *Substantially alter the existing drainage pattern of the site area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?*

Less Than Significant Impact

New drainage systems with three new outfalls into Old Alameda Creek would be proposed for the EWC Project, in order to accommodate the proposed new roadway alignment. The three new outfalls, which are for the hydromodification basins, are proposed to discharge above the 100-year water level. Bank armoring will be provided at the new outfall locations to address erosion potential, with rock slope protection. The RSP would be approximately 6 feet wide, 12 feet long and 2.6 feet deep.

In addition, a new Line M Bifurcation Pipe is proposed to help relieve the existing capacity issues that the existing Line M Channel is experiencing. These modifications would change the local drainage pattern within the vicinity of the Project limits. However, these diversions are proposed to enhance and restore the herbaceous wetlands and habitats within Old Alameda Creek. In addition, infiltration basins are proposed upstream of the new outfalls for the new roadway alignment. Therefore, the proposed diversions would not result in substantial erosion or siltation. The objective of the drainage design is to limit the design water surface elevations and velocities to no greater than the existing conditions, or to what can be handled by the existing conditions, at the boundary of the EWC Project.

The following permits would be required for impacts to drainages within jurisdictional areas: a USACE 404 Permit, 401 Water Quality Certification from the SFBRWQCB, and a Streambed Alteration Agreement from California Department of Fish and Game. All permit requirements would ensure a less than significant impact to drainage patterns on-site. Long term erosion and sediment controls would be addressed with storm water treatment measures and hydromodification management measures. Short term erosion and sediment controls would be addressed with the site design measures and source control measures, or the Construction Site BMPs. These BMPs and IMPs would be implemented to ensure that erosive potential would not increase.

d) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*

Less Than Significant with Mitigation Incorporated

The new Line M Bifurcation Pipe is proposed to help relieve the existing capacity issues that the existing Line M Channel is experiencing. Although this would alter the existing drainage pattern within the vicinity of the Project, this new Line M Bifurcation Pipe would relieve existing upstream flooding issues. Per a Memorandum of Understanding between the City of Union City and the ACFC &WCD, mitigation for impact to Old Alameda Creek is per Section 3.3 of the EIR.

The objective of the drainage design is to limit the design water surface elevations and velocities to no greater than the existing conditions, or to what can be handled by the

existing conditions at the boundary of the Project. In addition, the EWC Project's design goal is to maintain pre-construction storm water discharge flows by metering or detaining these flows to pre-construction rates, prior to discharging to a receiving water body or to an MS4 system. Therefore, there would not be a substantial increase in the rate or amount of surface runoff in a manner where it would result in flooding on- or off-site.

e) *Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?*

Less than Significant Impact

The EWC Project would increase the total impervious surface within the EWC Project limits and, therefore, would increase the volume of storm water runoff. Potential sources of pollutants from the roadway include: TSSs, nutrients, pesticides, particulate metals, dissolved metals, pathogens, litter, biochemical oxygen demand, and TDSs. Existing drainage facilities throughout the EWC Project limits, however, would be extended, replaced, repaired, and/or improved as necessary to provide proper off-site and highway drainage. In compliance with the ACCWP and Caltrans' NPDES requirements, water quality treatment BMPs/IMPs would be included where practicable. These include infiltration basins and Tree Well Filters at various locations throughout the EWC Project area, to address the potential for additional pollutants to be introduced in the storm water runoff from new or widened roadways.

f) *Otherwise substantially degrade water quality?*

Less than Significant Impact

The primary potential for impacts to water quality is eroded soil or suspended solids being introduced into the waterways. The proposed EWC Project is a major reconstruction project and therefore, shall be regulated under the ACCWP and the Caltrans' General NPDES Permits. The ACCWP Storm water treatment and hydromodification measures are required to be sized hydraulically in accordance with the C.3 Provisions. Therefore, it is anticipated that the EWC Project would not substantially degrade water quality.

6 PERMITS COORDINATION

Permits for the following listed agencies are anticipated for the EWC Project:

- Department of Fish and Game, 1600-1607 Permit (Streambed Alteration Agreement)–required for all work in streams

- SFBRWQCB, 401 Permit (Water Quality Certification)–Impacts to Waters of the State. A Dewatering Permit from the SFBRWQCB would also be required for areas that are excavated and are at or near a dewatering area. In this case, groundwater testing may be required. Monitoring wells will be considered at any specific locations where excavation is proposed with anticipated high groundwater depths or at locations where treatment BMPs are proposed, to verify whether monitoring wells are feasible.

- USACE, 404 Permit–required for all projects impacting the Waters of the US below the ordinary high water line.

- Caltrans–Notice of Construction

- ACCWP–Notice of Construction
- A Temporary Permit from Union Sanitation may be needed for dewatering contaminated ground water during construction

7 REFERENCES

Alameda Countywide Clean Water Program. (August 31, 2006). *C.3 Stormwater Technical Guidance (A Handbook for Developers, Builders and Project Applicants)*. <http://cleanwaterprogram.org/publications_home.htm> Last date accessed: June 4, 2008. Version 1.0.

Alameda Countywide Clean Water Program. (March 14, 2007). *HMP Susceptibility Map. (Revised Hydrograph Modification Management Provisions March 14, 2007).* <http://www.cleanwaterprogram.org/publications_libraryResources.htm#reportspubs (Reports and Publications Link)> Last date accessed: August 19, 2008.

Alameda County Water District, Engineering Department of Groundwater Resources Division. (2007). *Groundwater Monitoring Report 2007*. <http://www.acwd.org/engineering/groundwater.php5> Last date accessed: January 29, 2008.

California Department of Transportation. (March 1, 2003). *Caltrans Storm Water Quality Handbooks, Construction Site Best Management Practices Manual.* Figure 2-1. *Designation of Rainy Seasons*.

California State University Sacramento, Office of Water Programs. *Water Quality Planning Tool*. < http://stormwater.water-programs.com/wqpt> Last date accessed: May 19, 2008.

California Water Quality Condition Assessment Report. (2006). *Clean Water Act Section 305b Report 2006.* <www.waterboards.ca.gov/swamp> Last date accessed: August 20, 2008.

California Department of Water Resources. (2003). *California's Groundwater-Bulletin 118, Update 2003.* <http://www.groundwater.water.ca.gov/bulletin118/update2003/index.cfm> Last date accessed: May 22, 2008.

California Watershed Portal-Watershed Search Tools. *Alameda Creek (ha)*. <http://cwp.resources.ca.gov> Last date accessed: May 19, 2008.

City of Union City. (February 2002). *Land Use Element*.

City of Fremont. (November 2002). *Land Use Map*.

Federal Emergency Management Agency. (2000). *Flood Insurance Study, City of Fremont, California, Alameda County.*. Community Number-065028. Revised: February 9, 2000.

Fizber.com. (2008). *Union City Climate*. <http://climate.fizber.com/california-city-union-city-climate.html> Last date accessed: June 18, 2008.

Fugro West, Inc. (May 2008). *Phase I Environmental Assessment Proposed I-880 to 238 East-West Connector Alameda County, California.* Prepared for T.Y. LIN INTERNATIONAL. Fugro Project No. 3303.003.

ICF Jones and Stokes. (May 2008). *Delineation of Wetlands and Other Waters for the East-West Connector Project.*.

ICF Jones and Stokes. (July 2008). *Draft East West Connector Project Biological Resource Study.*

Parikh Consultants, Inc. (August 2008). *Geologic & Seismic Report, East West Connector between Route 880 and Mission Blvd., Alameda County, California.* Prepared for T.Y. LIN INTERNATIONAL. Job No. 208104.PGR.

San Francisco Bay Regional Water Quality Control Board. (2007). *Water Quality Control Plan* (*Basin Plan) for the San Francisco Bay Basin. Incorporating all amendments approved by the Office of Administrative Law as of January 18, 2007.* < http://www.swrcb.ca.gov/sanfranciscobay/basinplan.shtml> Last date accessed: August 20, 2008.

San Francisco Bay Regional Water Quality Control Board. (2006). *2006 CWA Section 303(d) List of Water Quality Limited Segments, USEPA.* Approval date: June 28, 2007.

United States Department of Agriculture, Natural Resources Conservation Service. *Web Soil Survey*. < http://websoilsurvey.nrcs.usda.gov> Last date accessed: June 17, 2008.

United States Census Bureau. *Keyword Search: Fremont; Union Cities*. <http://www.census.gov/> Last date accessed: June 2, 2008.

United States Geological Survey. (1997). *Newark, California Map.* Version 1997, Map Current as of: 1997. Contour Interval of 20 ft. Elevation Data of USGS 1 arc-second NED, 1 meter vertical precision.

Appendix A Water Quality Objectives; Surface and Groundwater

Appendix B Descriptions of Beneficial Uses

Appendix C Alameda Countywide Clean Water Program Tree Well Filters

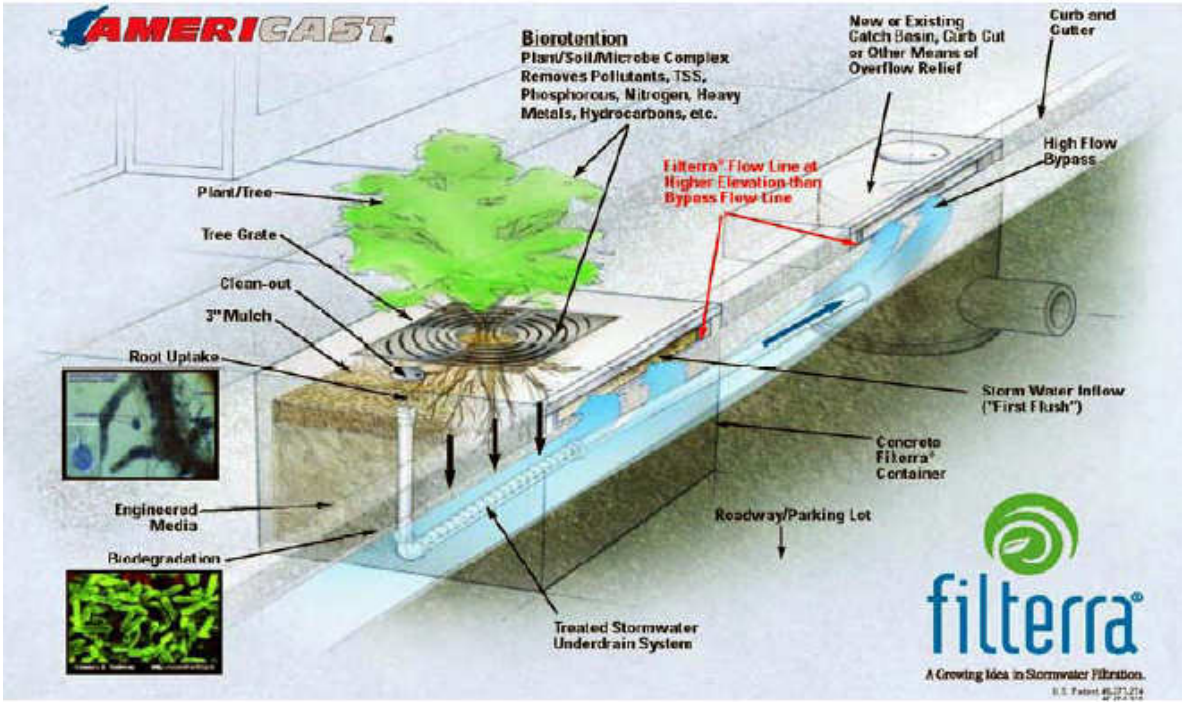
Alameda Countywide Clean Water Program Tree Well Filters

Best Uses
- Limited space
- Parallel to roadways

Advantages
- Aesthetic
- Small surface land use
- Blends with the landscape

Limitations
- Can clog without maintenance
- High installation cost
- Surface planting soils require replacement twice a year

Source: Alameda Countywide Clean Water Program C.3 Technical Guidance



Source: Alameda Countywide Clean Water Program C.3 Technical Guidance

Appendix D Post-construction Stormwater Controls for the East West Connector Project (Potential BMPs Locations Exhibit)

Appendix E 2006 CWA Section 303(d) List of Water Quality Limited Segments

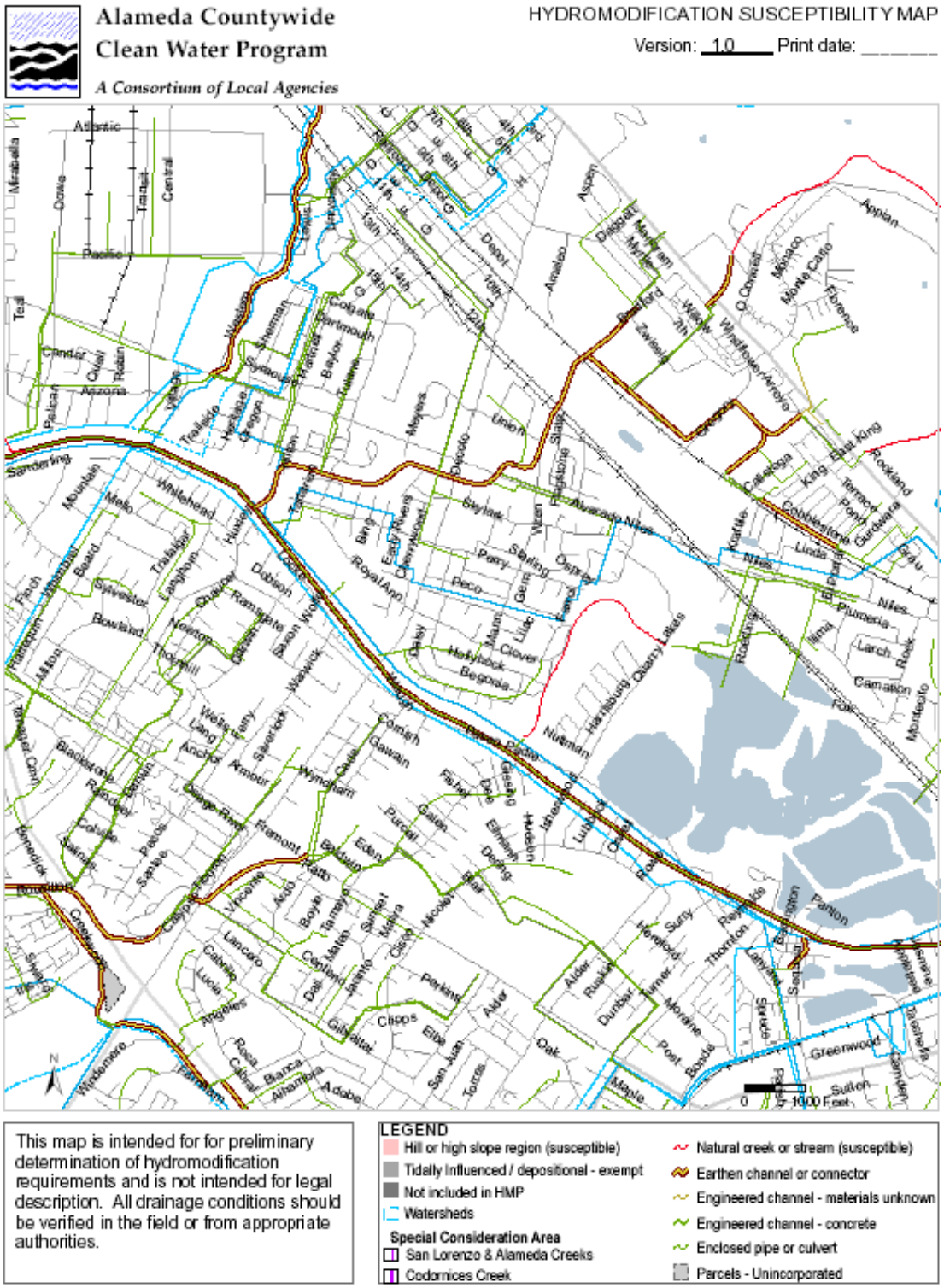
2006 CWA SECTION 303(d) LIST OF WATER QUALITY LIMITED SEGMENTS

(Those requiring TMDLS (A), being addressed by USEPA approved TMDLS (B), and being addressed by actions other than TMDLs (C))*

USEPA APPROVAL DATE: JUNE 28, 2007

REGION	TYPE	NAME	CALWATER WATERSHED	POLLUTANT/STRESSOR	POTENTIAL SOURCES	TMDL REQUIREMENT STATUS*	ESTIMATED SIZE AFFECTED	PROPOSED OR USEPA APPROVED TMDL COMPLETION
				Sedimentation/Siltation		B	92 Miles	2004
				The Trinity River HU, Upper HA, Trinity River, East Fork includes the following Calwater Super Planning Watersheds (SPWs): Mumbo Creek SPW 106.40030 and Blue Ridge SPW 106.40040.				
					Channel Erosion			
					Dam Construction			
					Erosion/Siltation			
					Flow Regulation/Modification			
					Habitat Modification			
					Harvesting, Restoration, Residue Management			
					Hydromodification			
					Logging Road Construction/Maintenance			
					Mine Tailings			
					Natural Sources			
					Nonpoint Source			
					Placer Mining			
					Removal of Riparian Vegetation			
					Resource Extraction			
					Silviculture			
					Streambank Modification/Destabilization			
					Surface Mining			
2	R	Alameda Creek	20430051					
				Diazinon		B	51 Miles	2007
				This listing was made by USEPA for the 1998 303(d) list. For 2006, diazinon was moved by USEPA from the 303(d) list to this being addressed list because of a completed USEPA approved TMDL.				
					Urban Runoff/Storm Sewers			
2	R	Alamitos Creek	20540041					
				Mercury		A	7.1 Miles	2006
				TMDL will be developed as part of the Santa Clara Basin Watershed Management Initiative. Additional monitoring and assessment is needed.				
					Mine Tailings			
2	L	Anderson Reservoir	20530050					
				Mercury		A	1613 Acres	2019
					Source Unknown			

Appendix F ACCWP's Hydromodification Susceptibility Map


Alameda Countywide
Clean Water Program
A Consortium of Local Agencies
HYDROMODIFICATION SUSCEPTIBILITY MAP
Version: 1.0 Print date: _____
This map is intended for for preliminary determination of hydromodification requirements and is not intended for legal description. All drainage conditions should be verified in the field or from appropriate authorities.
LEGEND
Hill or high slope region (susceptible)
Tidally influenced / depositional - exempt
Not included in HMP
Watersheds
Special Consideration Area
San Lorenzo & Alameda Creeks
Codornices Creek
Natural creek or stream (susceptible)
Earthen channel or connector
Engineered channel - materials unknown
Engineered channel - concrete
Enclosed pipe or culvert
Parcels - Unincorporated
0 1000 Feet