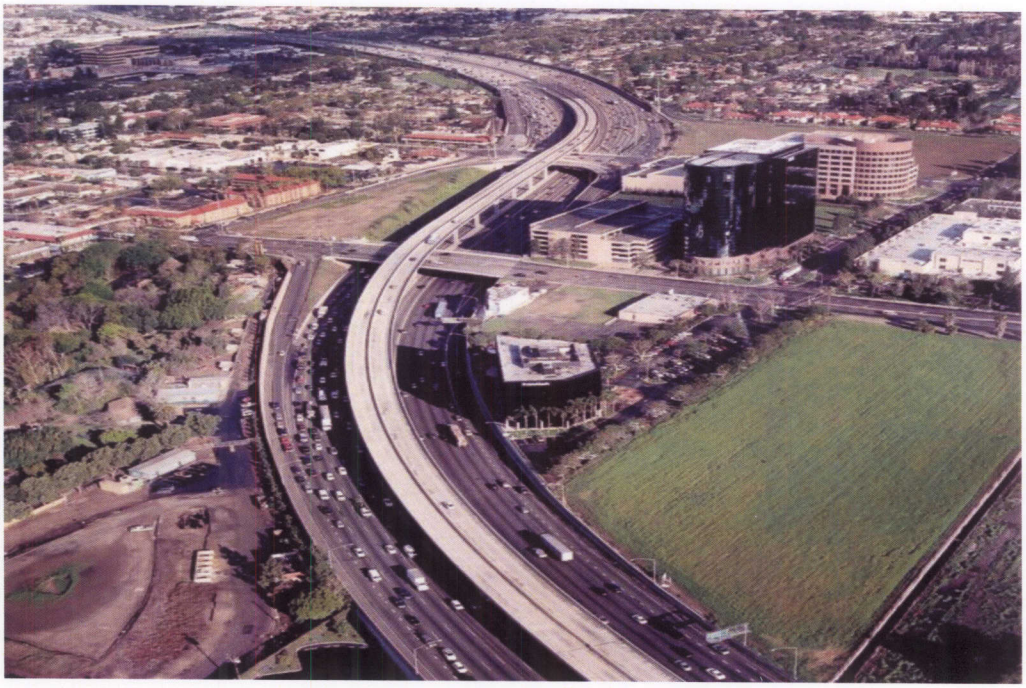
Water Quality Assessment Report for the OCTA I-5 HOV Lane Project



OCTA I-5 HOV Lane Project
Orange County, California

12-ORA-5-30.26/34.00
12-0C8900

March 2013

Caltrans

Water Quality Assessment Report

OCTA I-5 HOV Lane Project
Orange County, California

12-ORA-5-30.26/34.00
12-0C8900

March 2013

STATE OF CALIFORNIA
Department of Transportation

Prepared By: _____ Date: March 25, 2013
Yvana Kuhn, P.E
Associate Engineer
(619) 233-1454
AECOM
1420 Kettner Boulevard, Suite 500, San Diego, CA 92101

Approved By: _____ Date: March 25, 2013
Gary Sjelin, P.E., QSD (#23576)
Technical Leader
(714) 567-2510
AECOM
999 Town & Country Road, Orange, CA 92868

Approved By: _____ Date: March 25, 2013
Dennis Mak
Project Manager
(714) 560-~~6282~~ 5826
Orange County Transit Authority
550 S. Main Street, Orange, CA 92863-1584

Water Quality Assessment Report

OCTA I-5 HOV Lane Project
Orange County, California

12-ORA-5 PM 30.26/34.00
12-0C8900

March 2013

STATE OF CALIFORNIA
Department of Transportation

Approved By: _____ Date: 3/25/13

Grace Piña-Garrett, Senior T.E.
(949) 724-2625
Caltrans District 12
Division of Environmental Analysis
NPDES/ Storm Water Unit

The environmental review, certification, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by the California Department of Transportation (Caltrans) under its assumption of responsibility pursuant to 23 U.S. Code 327.

EXECUTIVE SUMMARY

The primary purpose of this Water Quality Assessment Report (WQAR) is to fulfill the requirements of the National Environmental Policy Act and the California Environmental Quality Act, and provide information, to the extent possible, for the National Pollutant Discharge Elimination System (NPDES) permitting by analyzing the potential impacts of the proposed project on water quality.

This WQAR discusses the proposed project, the environmental setting of the project area, and the regulatory framework with respect to water quality. It also provides data on surface water and groundwater resources within the project area and their water quality health, describes water quality impairments and beneficial uses, identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

This project proposes to decrease congestion along Interstate 5 between State Route 55 and State Route 57 by adding an additional high-occupancy vehicle lane in both directions. The project is located in the cities of Santa Ana, Orange, and Tustin in the County of Orange. Four project alternatives with two options can be applied to any alternative.

The project is within the Santa Ana Region (Region 8) and discharges to the Santa Ana River and San Diego Creek. The Santa Ana River is listed as being impaired for indicator bacteria under Section 303(d) of the Clean Water Act (CWA) and has State of California water quality objectives (WQO) for total dissolved solids (TDS) and nitrates.

The short-term impacts of construction would include an estimated disturbed soil area of 2.15 acres to 8.76 acres (see Table 1), depending on the alternative selected, and would generate pollutants of concern such as sediment/turbidity, nutrients, organic compounds, trash and debris, oxygen-demanding substances, oil and grease, pesticides, and metals. A Stormwater Pollution Prevention Plan (SWPPP), which is prepared for projects greater than 1 acre, will be prepared and implemented during construction of the proposed project. The SWPPP identifies specific best management practices (BMPs) that will be implemented during project construction. Furthermore, BMPs implemented as a part of the project would meet the technology requirements as stipulated in the (NPDES Construction General Permit and the California Department of Transportation's (Caltrans) NPDES Permit.

Among all alternatives, the maximum net addition of impervious surface is 1.45 acres. Compared to the total project footprint of more than 200 acres, the potential increase in runoff flow and resultant impact from this flow would be minor. However, the project will evaluate Caltrans-approved treatment BMPs to the maximum extent practicable (MEP) per the requirements of the Caltrans NPDES permit. Since Reach 2 of the Santa Ana River is CWA §303(d) listed for indicator bacteria, the treatment BMPs should target indicator bacteria as the design constituent. The proposed project should also meet the WQO described in Section 3.2.2 for TDS and nitrates.

Measures that the project must comply with include:

- WQ-1 (Compliance with Caltrans Statewide NPDES Permit)
- WQ-2 (Compliance with the Construction General Permit)
- WQ-3 (Implement Treatment BMPs)
- WQ-4 (Implement Design Pollution Prevention BMPs)

With implementation of the identified measures, the project construction, design, and facility operation will comply with the requirements of Caltrans' NPDES permit, Stormwater Management Plan, and applicable general NPDES permits.

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

1.1 Project Description

The Orange County Transportation Authority (OCTA), in cooperation with the California Department of Transportation – District 12 (Caltrans), is proposing improvements to Interstate 5 (I-5) between State Route 55 (SR-55) and State Route 57 (SR-57) within the cities of Tustin, Santa Ana, and Orange in Orange County. Figures 1 and 2 show the project location and vicinity, respectively.

The primary purpose of the proposed project is to improve traffic operations and reduce congestion on I-5 from north of SR-55 to south of SR-57 to improve the safe and efficient local and regional movement of people and goods, while minimizing environmental and community impacts. The project is intended to address the following issues:

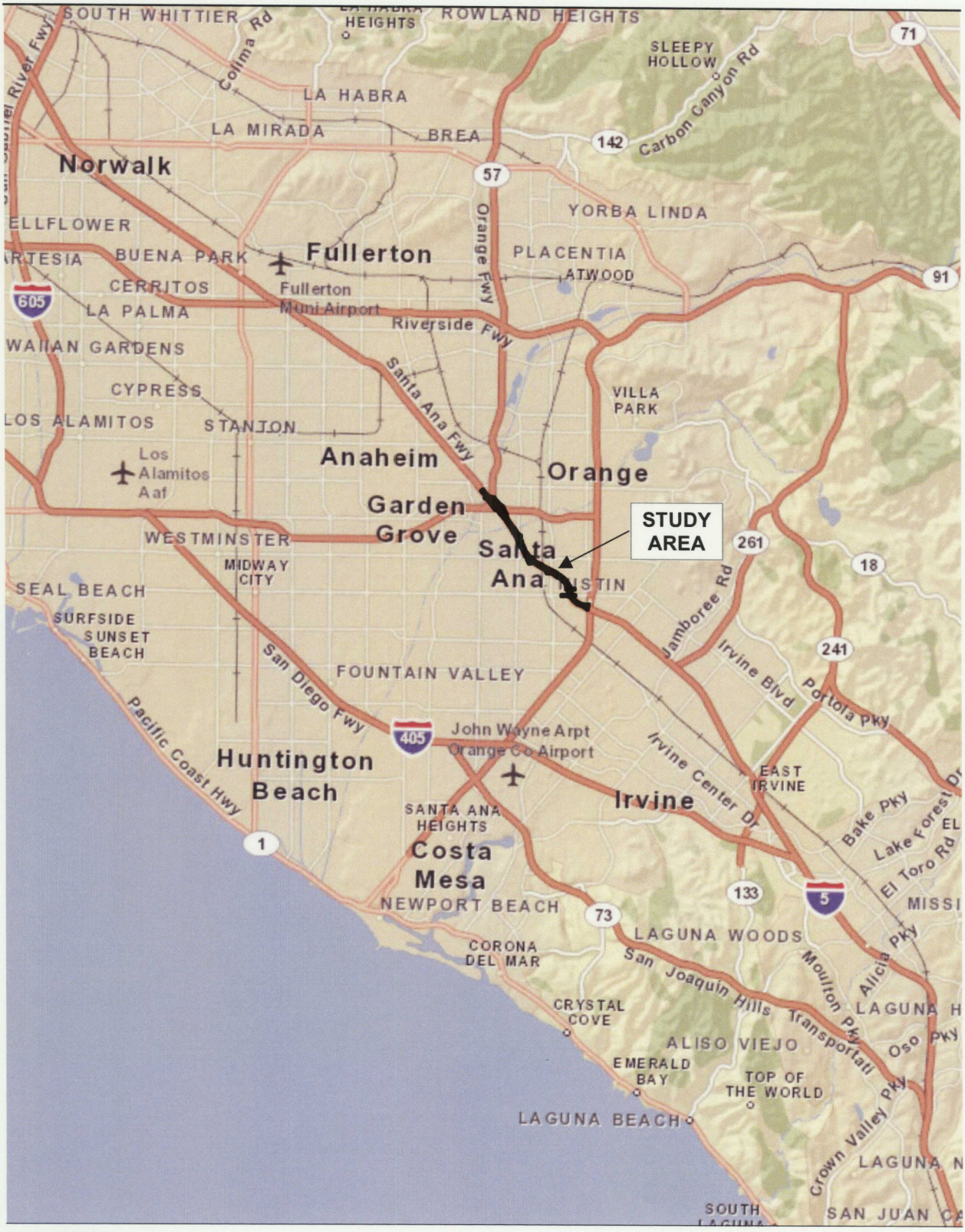
- Congestion and travel delay in the high-occupancy vehicle (HOV) lanes within the project limits.
- Congestion in the southbound (SB) general purpose (GP) lanes between Fourth Street and SR-55.

The project proposes to add a second HOV lane in each direction of I-5 from SR-55 (Post Mile [PM] 30.26) to SR-57 (PM 34.00). There are currently four alternatives, which are discussed below.

1.1.1 No Project Alternative

Under the No Build Alternative, the proposed project improvements would not be incorporated. The addition of HOV lanes, removal of the Main Street HOV drop ramps, modifications to the 1st and 4th Street on and off-ramps would not be implemented, and the project objective of reducing congestion would not be achieved under this alternative.

Although the No Build Alternative would avoid temporary operational impacts associated with construction of the proposed project, the No Build Alternative would not achieve any of the defined objectives. The No Build Alternative would not improve the traffic operations on I-5 between SR-55 and SR-57. The existing congestion within the project limits would not be reduced to improve the safe and efficient local and regional movement of people and goods, while minimizing environmental and community impacts. Future environmental conditions would be unchanged from those that currently exist. Currently, storm water runoff does not pass through any best management practices (BMPs) prior to concentrating flows into the drainage system. In addition, the existing congestion and travel delay in the HOV lanes would remain and continue to degrade. The existing congestion in the SB GP lanes between Fourth Street and SR-55 would also remain and continue to degrade.



Source: ESRI 2011

4 2 0 4 Miles

Scale: 1:250,000; 1 inch = 4 miles

Figure 1
Regional Map

Path: P:\2011\60220190\06GIS\6.3_Layout\OCTA_I-5\regional_map.mxd, 5/23/2012, augellop

I-5 (SR-55 to SR-57) HOV Lanes Improvement Project Water Quality Report

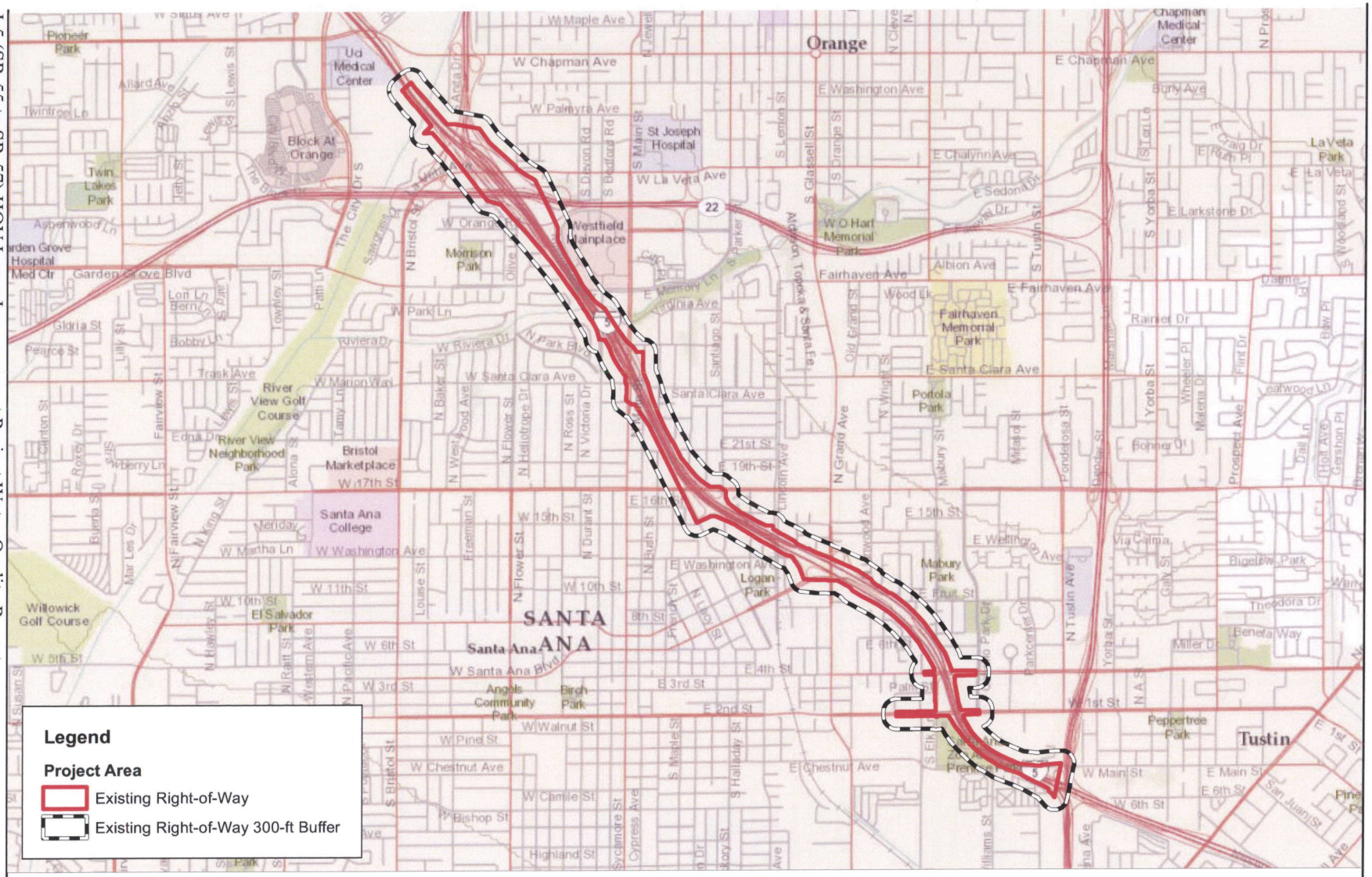


Figure 2
Vicinity Map

Path: P:\2011\60220190\06GIS\6.3_Layout\OCTA_I-5vicinity_map.mxd, 5/23/2012, augellop

1.1.2 Alternative 2A

Alternative 2A would build a second HOV lane in the general purpose (GP) area. This alternative would retain the existing HOV corridors inside the existing separated concrete barriers. It proposes to use the GP area and add a second continuous-ingress/egress HOV lane. The HOV-2 lane and adjacent GP lanes would consist of a modified left shoulder, the HOV-2 lane, four GP lanes, and a modified right shoulder. The HOV-1 lane would feature a modified left shoulder, the HOV-1 lane, and a modified right shoulder. This alternative would require construction of a tie-back retaining wall on the northbound (NB) and southbound (SB) sides of I-5 at the Lincoln Avenue overcrossing, and at NB I-5 at the SR-22 freeway abutment to accommodate the widening. Another retaining wall would be added along NB I-5 south of the exit ramp to Main Street/Broadway Boulevard. All improvement would be within the state's right-of-way. The estimated total disturbed soil area (DSA) for Alternative 2A is 8.18 acres.

1.1.3 Alternative 2B

Alternative 2B is similar to Alternative 2A, with the exception that the Main Street HOV drop-ramp would be removed. The estimated total DSA for Alternative 2B is 8.76 acres.

1.1.4 Alternative 5A

Alternative 5A proposes to add a second HOV lane inside the existing HOV facilities separated by concrete barriers. The concrete barrier between the HOV lanes and the GP lane would be removed and replaced with continuous ingress/egress striping. The concrete barrier separating the NB and SB lanes would be relocated closer to the centerline. The two contiguous HOV lanes would be 12 feet wide, with non-standard shoulders varying from 1 to 4 feet throughout the project limits. Five GP lanes would remain with modified shoulders. CHP Enforcement Areas would be constructed between 17th Street and Main Street in the SB direction and between the Broadway overcrossing and SR-22 EB Connector overcrossing in the NB direction. This alternative would require the construction of a tie-back retaining wall on the SB side of I-5 at Lincoln Avenue overcrossing. Relocation of two overhead sign structures and installation of overhead sign structures for the new HOV-1 and HOV-2 lane configurations would be required. The Main Street drop-ramp would remain in place. All improvements would be within the existing freeway/roadway right-of-way boundaries. The estimated total DSA for Alternative 5A is 3.19 acres.

1.1.5 Alternative 5B

This alternative is the same as Alternative 5A, with the exception that the Main Street drop-ramp would be removed. The estimated total DSA for Alternative 5B is 3.77 acres.

1.1.6 Ramp Alternative A

The project also proposes to improve operation by removing the choke point at the SB I-5/First Street on-ramp, Ramp Alternative A, and Ramp Alternative B. These two design options could be combined with any of the alternatives discussed above.

The Ramp Alternative A design option proposes to remove the existing SB I-5 on-ramp from First Street and construct a new SB I-5 on-ramp from Fourth Street. The existing NB I-5 off-ramp structure to First Street (U-shaped bridge) would be closed. A second left-turn lane on the NB I-5 exit ramp to westbound (WB) Fourth Street would be added and a portion of the NB exist ramp at this location would be restriped. A portion of the existing slope would be removed and a new retaining wall would be constructed in front of the west abutment of the First Street overcrossing and adjacent to the pump station. The estimated total DSA for the SB I-5 on-ramp at Fourth Street for Alternative A is 2.79 acres.

1.1.7 Ramp Alternative B

The project proposes to remove the existing SB I-5 on-ramp from First Street and construct a new loop on-ramp for Ramp Alternative B. The existing NB I-5 off-ramp structure to First Street (U-shaped bridge) would remain in place. Two retaining walls would be constructed to support the exterior curve of the loop ramp. A portion of the existing slope would be removed and a new retaining wall would be constructed in front of the west abutment of the First Street overcrossing and adjacent to the pump station. The estimated total DSA for the SB I-5 on-ramp at Fourth Street for Alternative B is 2.15 acres.

1.2 Approach to Water Quality Assessment

The purpose of the Water Quality Assessment Report (WQAR) is to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information, to the extent possible, for National Pollutant Discharge Elimination System (NPDES) permitting. The WQAR includes a discussion of the proposed project, the physical setting of the project area, and the regulatory framework with respect to water quality. It also provides data on surface water and groundwater resources within the project area and the water quality of these waters, describes water quality impairments and beneficial uses, identifies potential water quality impacts/benefits associated with the proposed project, and recommends avoidance and/or minimization measures for potentially adverse impacts.

This page intentionally left blank.

2. REGULATORY SETTING

2.1 Federal Laws and Requirements

Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to waters of the United States (U.S.) from any point-source unlawful unless the discharge is in compliance with an NPDES permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point-sources to comply with the NPDES permit scheme. Relevant CWA sections are as follows:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the CWA. (Most frequently required in tandem with a Section 404 permit request. See below.)

- Section 402 establishes the NPDES, a permitting system for the discharge (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and Municipal Separate Storm Sewer Systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters."

USACE issues two types of 404 permits: Standard and General Permits. There are two types of General Permits: Regional Permits and Nationwide Permits. Regional Permits are issued for a general category of activities when they are similar will and cause minimal environmental effect. Nationwide Permits are issued to authorize a variety of minor project activities with no more than minimal effects.

There are also two types of Standard Permits: Individual Permits and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard Permits. For Standard Permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency's (USEPA) Section 404 (b)(1) Guidelines (USEPA Code of Federal Regulations [CFR] 40 Part 230), and whether permit approval is in the public interest. The 404(b)(1) Guidelines were developed by USEPA in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic

system (waters of the U.S.) only if there is no practicable alternative that would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have less effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures have been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from USACE, even if not subject to the 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4.

National Flood Insurance Act

The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP). The NFIP is a federal program administered by the Flood Insurance Administration of the Federal Emergency Management Agency (FEMA). It enables individuals who have property within the 100-year floodplain to purchase insurance against flood losses. Community participation and eligibility, flood hazard identification, mapping, and floodplain management aspects are administered by state and local programs, and support directorate within FEMA. FEMA works with the states and local communities to identify flood hazard areas, and publishes a flood hazard boundary map of those areas. Floodplain mapping is an ongoing process, and maps are regularly updated for major rivers and tributaries as land uses and development patterns change.

Executive Order 11988 — Floodplain Management

Executive Order (EO) 11988 directs federal agencies to avoid, to the extent practicable and feasible, short- and long-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Further, EO 11988 requires the prevention of uneconomic, hazardous, or incompatible use of floodplains; protection and preservation of the natural and beneficial floodplain values; and consistency with the standards and criteria of the NFIP.

The basic tools for regulating construction in potentially hazardous floodplain areas are local zoning techniques and FEMA floodplain mapping. The Federal Insurance Rate Map (FIRM) is the official map created and distributed by FEMA and NFIP that delineates Special Flood Hazard Areas (SFHAs)—areas that are subject to inundation by a base flood—for every county and community that participates in the NFIP. FIRMs contain flood risk information based on historic, meteorological, hydrologic, and hydraulic data, as well as open-space conditions, flood control works, and development.

For projects that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source, and, thus, result in the modification of the existing regulatory floodway, effective Base Flood Elevations (BFEs), or SFHA, a conditional letter of map revision (CLOMR) would need to be prepared and approved by Caltrans, Orange County and FEMA prior to any work occurring.

Figure 3 shows the 100-year and 500-year flood zones in the project vicinity. Most of the project site has been determined to be outside of the 100-year and 500-year flood zones. The northwestern one-third of the project site is in the 500-year flood zone, and 100-year flood zones surround the Santa Ana and Santiago Rivers.

California Fish and Game Code

Under Sections 1601–1603 of the Fish and Game Code, agencies are required to notify the California Department of Fish and Game (CDFG) prior to implementing any project that would divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake.

2.2 State Laws and Requirements

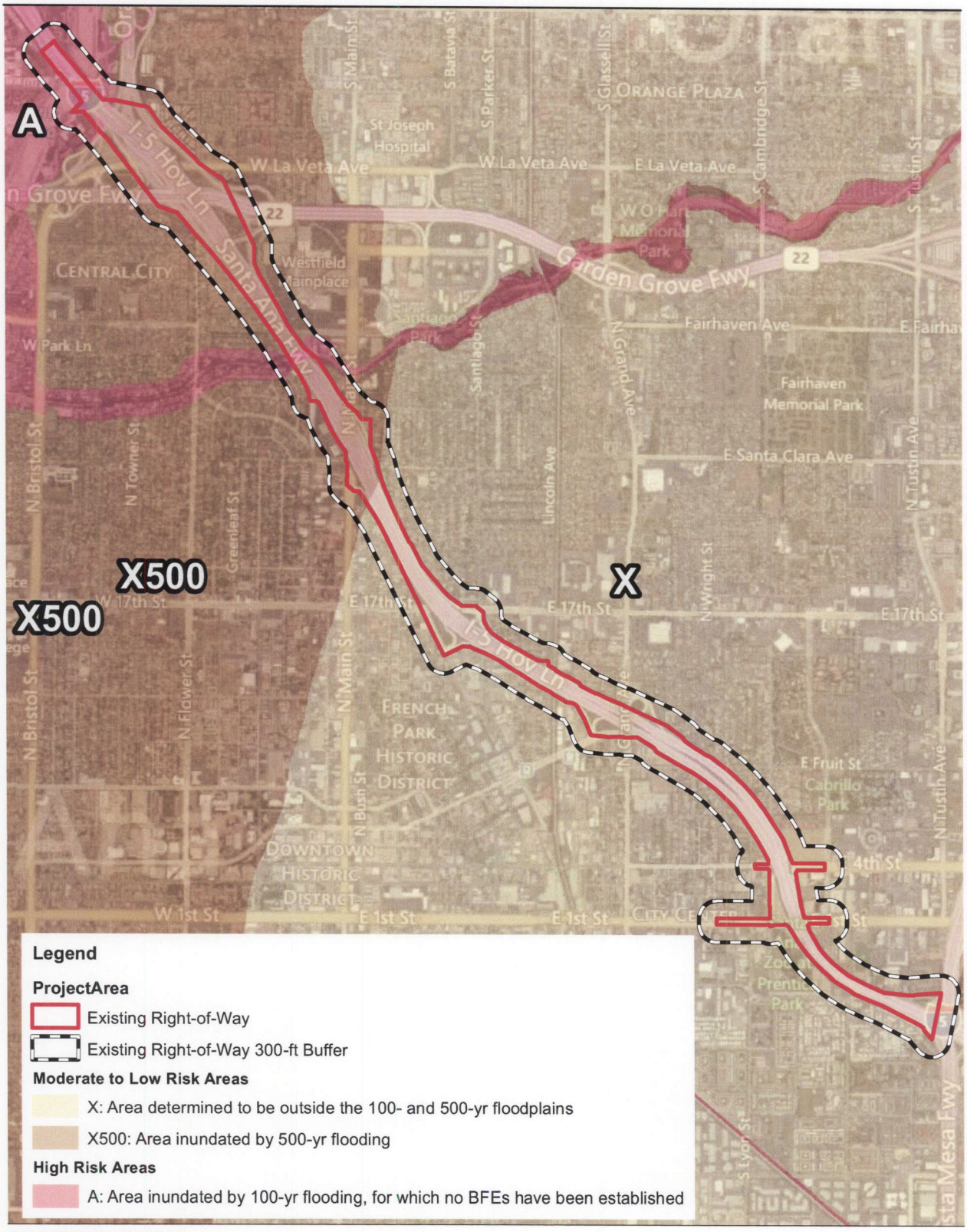
Porter-Cologne Water Quality Control Act

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 gaseous) to land or surface waters that may impair beneficial uses of surface and/or groundwaters of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., and consist of groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste," as defined; this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs), and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions, 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, the SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If the state determines that waters are impaired for one or more constituents and the standards cannot be met through point-source or non-source-point controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify 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 adjudicates water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.



Source: ESRI 2012; FEMA 2007

2,500 1,250 0 2,500 Feet

Scale: 1:30,000; 1 inch = 2,500 feet

Figure 3
FEMA Flood Zones

Path: P:\2011\60220190\06GIS\6.3_Layout\OCTA_I-5\WaterQualityReport\FEMA_floodzones.mxd, 5/23/2012, augellop

National Pollution Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water dischargers, including MS4s. USEPA defines an 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, county, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water." The SWRCB has identified Caltrans as an owner/operator of an MS4 pursuant to federal regulations.

In 1999, Caltrans was issued a statewide NPDES permit (Order 99-06-DWQ, NPDES No. CAS00003), which requires Caltrans to regulate non-point-source discharges from its properties, facilities, and activities. The newly adopted Caltrans Statewide NPDES Permit (Order No. 2012-0011-DWQ, NPDES No. CAS000003) becomes effective July 1, 2013. The NPDES permit requires development of a program for communication with local agencies and coordination with other MS4 storm sewer system programs where those programs overlap geographically with Caltrans' facilities. Caltrans' MS4 Permit contains three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below).

2. Caltrans must implement a year-round program in all parts of the state to effectively control storm water and non-storm water discharges.

3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) best management practices (BMPs) to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed and annually updates 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 assigns responsibilities within Caltrans for implementing storm water management procedures and practices, training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices that Caltrans 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 BMPs. The proposed project would follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ), adopted on November 16, 2010, became effective on February 14, 2011. The permit regulates storm water discharges from construction sites that would result in a DSA of 1 acre or greater and/or are smaller sites that are part of a larger common plan of development. For all projects subject to the Construction General Permit, applicants are required to develop and implement a

Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Standard Specifications for Caltrans, a Water Pollution Control Plan (WPCP) is necessary for projects with a DSA of less than 1 acre.

By law, all storm water discharges associated with clearing, grading, and excavation for construction and results in soil disturbance of at least 1 acre must comply with the provisions of the Construction General Permit. Construction activities that result in soil disturbances of less than 1 acre are subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity, as determined by the RWQCB. Operators of regulated construction sites are required to develop SWPPPs; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Level 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the risk level. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff, pH, and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns about discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as inclusion of specific features, effluent limitations, monitoring, and plan submittals, that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges.

2.3 Regional and Local Requirements

Santa Ana Regional Water Quality Control Board

The SWRCB carries out its water quality protection authority through the adoption of Basin Plans. These plans establish water quality standards for particular bodies of water. California water quality standards are composed of three parts: the designation of beneficial uses of water, water quality objectives to protect those uses, and implementation programs designed to achieve and maintain compliance with water quality objectives. The RWQCB, Santa Ana Region, is responsible for the Basin Plan for the Santa Ana Basin, where the proposed project lies. The

RWQCB implements management plans to modify and adopt standards under provisions set forth in Section 303(c) of the CWA and the California Water Code (Division 7, Section 13240).

The SWRCB adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California in 2000. This policy provides implementation measures for criteria contained in the California Toxics Rule, promulgated in May 2000 by USEPA. When combined with the beneficial use designations in the Basin Plan, these documents establish statewide water quality standards for toxic constituents in surface waters.

Basin Plan

The Basin Plan for the Santa Ana River Basin (RWQCB Region 8), most recently amended in June 2011, establishes water quality objectives for constituents that could potentially cause an adverse effect or impact on the beneficial uses of water. Specifically, Basin Plans are designed to accomplish the following:

1. Designate beneficial uses for surface and ground waters.
2. Set the narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to California's anti-degradation policy.
3. Describe implementation programs to protect the beneficial uses of all water in the region.
4. Describe surveillance and monitoring activities to evaluate the effectiveness of the Basin Plans.

Basin Plans incorporate by reference all applicable SWRCB and RWQCB plans and policies.

In addition to Basin Plan requirements, the RWQCB has water quality control authority under Section 401 of the CWA if a city were to apply for a Nationwide Permit under Section 404 of the CWA.

Total Maximum Daily Load

TMDL refers to the amount of a specific pollutant a river, stream, or lake can assimilate and still meet federal water quality standards as provided in the CWA. TMDL accounts for all sources of pollution, including point sources, non-point sources, and natural background sources. Section 303(d) requires that regulatory agencies determine TMDLs for all water bodies that do not meet water quality standards. The Section 303(d) list of impaired water bodies provides a prioritization and schedule for development of TMDLs for the state.

The SWRCB, in compliance with the Section 303(d) of the CWA (33 U.S. Code [USC] Section 1313[d]), prepared, and USEPA approved, a 2010 list of impaired water bodies in California. The list includes a priority schedule for the development of TMDLs for each contaminant or "stressor" impacting the water body.

The proposed project area crosses the Santa Ana River, Reach 2, at the northern limit and the Santiago Creek at North Broadway. The Santa Ana River Reach 2 is impaired for indicator bacteria from unknown sources (RWQCB 2011a). The Santiago Creek is not included in this 303(d) list.

Orange County NPDES Permit

Though the proposed project is subject to the Caltrans Statewide NPDES permit, the storm water drainage system within the Caltrans right-of-way connects to the Orange County flood control system. As a result, the proposed project is also subject to the RWQCB's Orange County MS4 Permit, Order R8-2009-0030 (amended by Order R8-2010-0062). The proposed project design would have to comply with requirements and measures outlined in this municipal permit to minimize impacts to water quality and runoff hydrology for the construction and operational phases of the proposed project.

Drainage Area Management Program

The Drainage Area Management Plan (DAMP) was implemented and created by the County of Orange, the Orange County Flood Control District, and its incorporated cities (permittees) in 1993. It was revised in 2003. The DAMP is the principle policy and guidance document for the NPDES program. It is the foundation for model programs, local implementation plans, and watershed implementation plans. Section 7 of the DAMP discusses issues relating to new development and significant redevelopment. Section 8 discusses issues relating to pollution prevention during construction. Section 11 describes the water quality monitoring programs being undertaken by the permittees.

3. AFFECTED ENVIRONMENT

3.1 General Setting

The proposed project is located in central Orange County within the cities of Tustin, Santa Ana, and Orange. The surrounding area is highly urbanized with a high proportion of impervious surfaces. The general topology is fairly flat with the grade sloping to the south toward Peters Canyon Wash and to the southwest along the Santa Ana River. Some embankments would be impacted by the proposed project widening of some alternatives. The alignment also passes over the banks of the Santa Ana River and Santiago Creek. The region is generally characterized by short, mild winters and dry summers. The mean temperature range for the months of November through April is 8°C (46.4°F) to 21°C (53.6°F). The mean temperature range for the months of May through October is 15°C (59°F) and 31°C (87.8°F). The average annual precipitation for the Orange County area is approximately 330 millimeters (13 inches).

3.1.1 Population and Land Use

The areas on both sides of I-5 and within the project limits are fully developed. Land uses include single-family homes, medium-density residential, commercial, and business buildings. Some noticeable landmarks are the Santa Ana Zoo near First Street, Discovery Science Center at North Main Street, Rancho Santiago Community College on North Main Street, and West Field Main Place Santa Ana Shopping Center on North Broadway.

3.1.2 Topography

Topography of the area is generally flat. Elevations near the center of the project site peak at 160 feet above mean sea level (msl) near the intersection of 17th Street and I-5. Elevations gradually decrease along the alignment to the northwest and southwest to about 125 feet above msl.

3.1.3 Hydrology

The following discussion addresses the existing surface and groundwater hydrology, drainage, water quality, and potential flooding conditions that characterize the proposed project site and surrounding area.

3.1.3.1 Regional Hydrology

Orange County lies within the Santa Ana Region (Region 8). In very broad terms, the Santa Ana Region is a group of connected inland basins and open coastal basins drained by surface streams flowing generally southwest to the Pacific Ocean.

The boundaries between California's nine regions are usually hydrologic divides that separate watersheds, but the boundary between the Los Angeles and Santa Ana Regions is the Los Angeles County Line. Since that county line only approximates the hydrologic divide, part of the Pomona area drains into the Santa Ana Region, and, in Orange County, part of the La Habra area drains into the Los Angeles Region.

The east/west alignment of the crest of the San Gabriel and San Bernardino Mountains separates the Santa Ana River basin from the Mojave Desert, which is part of the Lahontan Basin (Region 6).

In the south, the regional boundary divides the Santa Margarita River drainage area from the San Jacinto River, which normally terminates in Lake Elsinore. Near Corona, the Santa Ana River cuts through the Santa Ana Mountains and flows down into the Orange County coastal plain. The Pacific Ocean coast of the Santa Ana Region extends from just north of Laguna Beach up to Seal Beach and the Los Angeles County line. Aquatic features on the coast include Newport Bay, Anaheim Bay-Huntington Harbor, and the major coastal wetlands areas associated with those bays.

3.1.3.2 Local Hydrology

The proposed project site lies in the Lower Santa Ana River Hydrologic Area and, more specifically, in the East Coastal Plain Hydrologic Subarea. Any drainage off of the project site will eventually drain into the Santa Ana River and the Pacific Ocean. Figure 4 shows the hydrologic features in the vicinity of the project.

3.1.3.2.1 Precipitation and Climate

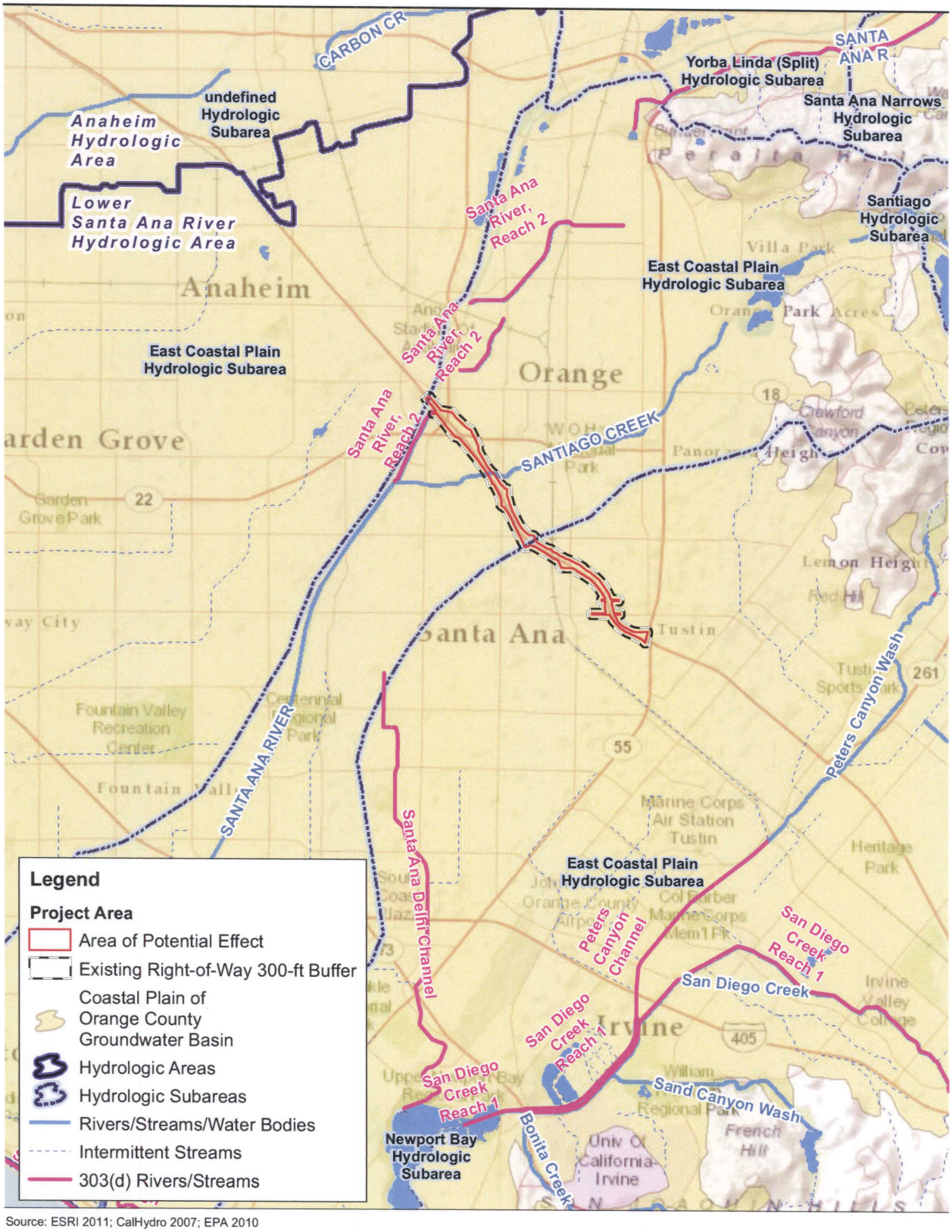
Precipitation in Orange County is derived from frontal low-pressure systems that originate over the Pacific Ocean and travel generally west into California. The proposed project site is situated in the Los Angeles Basin. The weather is characterized by mild, wet winters and dry, warm summers. The mean annual precipitation is 14 inches. The majority of the annual precipitation falls as rain from November through April. The 10-year, 24-hour average precipitation amount is 3.0 inches, and the 100-year, 24-hour average precipitation amount is 5.6 inches for the proposed project area (County of Orange 1986).

3.1.3.2.2 Surface Streams

Local surface waters near the proposed project area are the Santa Ana River, Santiago Creek, Peters Canyon Wash, and San Diego Creek (Figure 4). The Santa Ana River crosses the proposed project area on the northwestern end. It is the largest river in Southern California, with the headwaters in the San Bernardino Mountains; it drains into the Pacific Ocean after passing by the City of Santa Ana. The ecosystems vary widely along the river, and many different types of wildlife depend on it for survival. However, for flood control purposes, much of the river has been channelized and dammed. The Santiago Creek is a major tributary of the Santa Ana River.

3.1.3.2.3 Floodplains

The Santa Ana River and Santiago Creek are most significant to the project because of their proximity to the proposed project site and their history of flooding, which has been aggravated by upstream urban runoff.



Source: ESRI 2011; CalHydro 2007; EPA 2010

1.9 0.95 0 1.9 Miles

Scale: 1:120,000; 1 inch equals 1.9 miles

Figure 4
Hydrology

Path: P:\2011\60220190\06GIS\6.3_Layout\OCTA_I-5\WaterQualityReport\Hydrology_fig.mxd, 5/23/2012, augellop

FEMA provides information on flood hazards and frequency on its FIRMs for cities and counties, and identifies designated zones of flood hazard potential. The proposed project site is within various FEMA flood zones, including A (areas inundated by 100-year flooding, for which no BFEs have been established), X500 (areas inundated by the 500-year flood), and X (areas determined to be outside of the 100- and 500-year floodplains), as defined by FEMA geographic information systems (GIS) data.

3.1.3.2.4 Municipal Supply

There is no drinking water reservoir and/or recharge facility within the project limits.

3.1.3.3 Groundwater Hydrology

The proposed project site is entirely underlain by the Orange County Groundwater Basin (Figure 4). The basin is a vast underground aquifer that supplies more than 20 cities and water agencies and has a surface area of 224,000 acres. The basin underlies a coastal alluvial plain and is bounded by consolidated rocks exposed on the north in the Puente and Chino Hills, on the east in the Santa Ana Mountains, and on the south in the San Joaquin Hills. The basin has a thick accumulation of fresh-water-bearing interbedded marine and continental sand, silt, and clay deposits. Most surface waters recharge the basin through the coarser, more interconnected, and permeable deposits nearer to the coast. The sediments containing easily recoverable fresh water extend to about 2,000 feet in depth. Groundwater is about 27 meters (88 feet) below ground.

3.1.4 Geology/Soils

3.1.4.1 Soil Erosion Potential

The Natural Resources Conservation Service (NRCS) Soil Survey for Orange County, California, describes surface soils across the site as Hueneme Fine Sandy Loam Drained, Metz Loamy Sand Moderately Fine Substratum, Mocho Sandy Loam 0 to 2% Slopes, Mocho Loam 0 to 2% Slopes, Riverwash, and San Emigdio Fine Sandy Loam 0 to 2% Slopes (Figure 5). The majority of the proposed project site is underlain by Mocho Loam (USDA 1978).

Hueneme Fine Sandy Loam Drained is nearly level soil, generally occurring on large alluvial fans or floodplains. Drainage has been altered by the lowering of the water table to below 60 inches at all times. On bare soil, runoff is slow and erosion hazard is slight. Available water capacity is 7 to 9 inches (USDA 1978).

Metz Loamy Sand is also nearly level soil, generally occurring on alluvial fans or floodplains. On bare soil, runoff is slow and the erosion hazard is slight. The available water capacity is 5 to 6 inches. After periods of above-average rainfall, the water table is intermittently less than 40 to 60 inches (USDA 1978).

Mocho Sandy Loam, 0 to 2 % slopes, is also nearly level soil, generally occurring on alluvial fans or floodplains. Surface layer of the soil is 10 to 14 inches thick. On bare soil, runoff is slow and the erosion hazard is slight. The available water capacity is 9.5 to 12.0 inches (USDA 1969).

Figure 5
Soils

Path: P:\2011\60220190\06GIS\6.3_Layout\OCTA_I-5\WaterQualityReport\soils.mxd, 5/23/2012, augellop

Mocho Loam, 0 to 2 % slopes, is also nearly level soil, generally occurring on alluvial fans or floodplains. On bare soil, runoff is slow and the erosion hazard is slight. The available water capacity is 9.5 to 12.0 inches (USDA 1978).

Riverwash consists of unconsolidated alluvium, generally stratified and varying widely in texture. These are sandy, gravelly, cobbly, and bouldery deposits that support little to no vegetation. It is also subject to frequent changes due to stream overflow. The erosion hazard is high, as runoff is generally rapid. The alluvium is in constant flux (USDA 1978).

Metz Loamy Sand is also nearly level soil, generally occurring on alluvial fans on floodplains and along stream channels. On bare soil, runoff is slow and the erosion hazard is slight. The available water capacity is 7 to 9 inches (USDA 1978).

According to the NRCS Web Soil Survey, the project area contains soils mostly of Hydrologic Group B, with a moderate infiltration rate when thoroughly wet.

The erosivity index for the project area is 119.6, based USEPA's Storm Water Phase II Final Rule, Construction Rainfall Erosivity Waiver. The soil-erodibility K factor is 0.32, based on values provided by the NRCS Web Soil Survey. The Length-Slope topography effect factor is 6.8. Based on the above information, the project site was calculated as Risk Level 2, and would need to comply with Construction General Permit requirements.

3.1.5 Biological Communities

3.1.5.1 Aquatic Habitat

3.1.5.1.1 Special-Status Species

According to the Draft Natural Environment Study for the project (AECOM 2012), none of the special-status species that are known in the vicinity of the project are expected to occur on the project site due to the lack of suitable habitat.

3.1.5.1.2 Stream/Riparian Habitats

The Santa Ana River and the Santiago Creek pass through the project footprint. Both the Santa Ana River and Santiago Creek are channelized in the vicinity the project footprint. As a result, no riparian habitat exists within the project footprint. The nearest non-channelized portion of Santiago Creek is more than 1 mile downstream and 1.3 miles upstream.

3.1.5.1.3 Wetlands

As a result of the channelization of the Santa Ana River and Santiago Creek, no wetland habitat is found within the project footprint.

3.1.5.1.4 Fish Passage

As the Santa Ana River and Santiago Creek would not be impacted by the proposed project, the potential for fish passage would also not be impacted.

3.2 Water Quality Objectives/Standards and Beneficial Uses

3.2.1 Surface Water Quality Objectives/Standards and Beneficial Uses

The proposed project footprint intersects Reach 2 of the Lower Santa Ana River and Reach 1 of the Santiago Creek, a tributary of the Santa Ana River. The total dissolved solids (TDS) water quality objective for Reach 2 of the Lower Santa Ana River is 650 milligrams per liter (mg/L). The TDS water quality objective for Reach 1 of the Santiago Creek is 600 mg/L. The project could indirectly impact Reach 1 of the San Diego Creek through its tributary, Peters Canyon Wash. The water quality objectives for Reach 1 of the San Diego Creek are 1,500 mg/L of TDS, 13 mg/L of total inorganic nitrogen, and 90 mg/L of chemical oxygen demand. Peters Canyon Wash does not have any quantitative water quality objectives.

Beneficial uses and their Basin Plan designations for water bodies in the vicinity of the proposed project site are as follows (RWQCB 2011b):

Santa Ana River Reach 2

- AGR: Agricultural Supply
- GWR: Groundwater Recharge
- REC-1: Water Contact Recreation
- REC-2: Noncontact Water Recreation
- WARM: Warm Freshwater Habitat
- RARE: Preservation of Rare and Endangered Species
- WILD: Wildlife Habitat

Santiago Creek Reach 1

- MUN: Municipal and Domestic Supply
- GWR
- REC-1
- REC-2
- WARM
- WILD

San Diego Creek Reach 1

- REC-1
- REC-2
- WARM
- WILD

Peters Canyon Wash (Intermittent Beneficial Uses)

- GWR
- REC-1
- REC-2

- WARM
- WILD

3.2.2 Groundwater Quality Objectives/Standards and Beneficial Uses

The proposed project site is entirely underlain by the Orange County Groundwater Basin (Figure 4). The beneficial uses of the basin include municipal supply, agricultural supply, industrial service supply, and industrial process supply. All groundwaters are subject to the narrative water quality objectives described to the Santa Ana Basin Plan (RWQCB 2011b) and the following quantitative objectives:

- 580 mg/L TDS
- 3.4 mg/L Nitrate as Nitrogen

3.3 Existing Water Quality

3.3.1 Regional Water Quality

As previously discussed, the proposed project lies within the Santa Ana Region. According to the Watershed Management Initiative (WMI), the major issues facing the region in terms of water quality include nitrogen/TDS management in the Santa Ana River, water quality problems associated with dairies, and coastal beaches (RWQCB 2004). TDS in the Santa Ana River results from multiple use cycles of its water increasing TDS with each use. Groundwater desalting plants are adding the desalted water to water supplies. Excess nitrogen in the Santa Ana River is primarily a result of historical agricultural practices (RWQCB 2004).

As a part of the National Water Quality Assessment Program, the United States Geologic Survey (USGS) intensively monitored the water quality of the Santa Ana River Basin from 1999–2001 (USGS 2004). The study determined that, as a result of urbanization, the primary source of base flow for the Santa Ana River is treated wastewater effluent. Secondary sources include mountain runoff, urban runoff, and groundwater influx. Water quality is affected by these sources of flow. This study found high levels of nitrates and widespread presence of volatile organic compounds, pesticides, organochlorine compounds, and semivolatile organic compounds (SVOCs) in the Santa Ana River Basin. Also, aquatic invertebrate and algal communities were degraded in the Santa Ana River. Since chemicals like pesticides and SVOCs can persist for long periods of time, several banned chemicals are still detected in stream bed sediment. However, sediment bore samples have shown that concentrations of these chemicals are higher in older sediments and lower in younger sediments. Some chemicals fluctuate with climate as a result of higher runoff rates during wet periods and greater pollutant transport (USGS 2004).

The Orange County Coastkeeper monitored water quality in the Santa Ana River Basin from 2002–2004. They monitored 18 sites in four streams in Orange County: Santa Ana River, Santiago Creek, Silverado Canyon Creek, and San Diego Creek (Orange County Coastkeeper 2004). The Santa Ana River had high levels of total coliform, E. coli, and orthophosphate. During this study, levels of TDS, ammonia, and nitrate nitrogen were within acceptable levels. Bioassessment study of the Santa Ana River showed it to be in poor to fair condition. The San Diego Creek had high levels of total coliform, E. coli, orthophosphate, and TDS. Levels of

ammonia and nitrate nitrogen in the creek were also within acceptable levels. Bioassessment study of the San Diego Creek showed it to be in poor condition. Santiago Creek monitoring showed mixed results for total coliform and E. coli. Orthophosphate levels were high. Bioassessment surveys showed that the creek was in fair to excellent condition (Orange County Coastkeeper 2004).

3.3.2 List of Impaired Waters

The Santa Ana River Reach 2 is impaired for indicator bacteria from unknown sources (RWQCB 2011a).

This page intentionally left blank.

4. ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

The proposed project would include pipes, culverts, ditches, dikes, and swales. The flow would be directed to the existing storm water drainage system. Localized scour would be mitigated with rock slope protection and flared end sections. There are no off-site drainages areas that contribute to the runoff that would be generated by this project.

Among all alternatives, the maximum net addition of impervious surface is 1.45 acres. Compared to the total project footprint of more than 200 acres, the potential increase in runoff flow and resultant impact from this flow would be minor. However, the project will evaluate Caltrans-approved treatment BMPs to the maximum extent practicable (MEP) per the requirements of the Caltrans NPDES permit. Since Reach 2 of the Santa Ana River is 303(d) listed for indicator bacteria, the treatment BMPs should target indicator bacteria as the design constituent. The proposed project should also strive to meet the WQO described in Section 3.2.2 for TDS and nitrate.

4.2 Potential Impacts to Water Quality

4.2.1 Temporary Impacts to Water Quality

4.2.1.1 No Build Alternative

Under the No Build Alternative, no improvements other than routine roadway and bridge maintenance would be made. Therefore, this alternative would result in no short-term water quality impacts from construction-related activities.

4.2.1.2 Build Alternatives 2A, 2B, 5A, 5B, Option A, and Option B

As discussed in Section 1.1.2, Alternative 2A would have a DSA of 8.18 acres and would include outside shoulder widening, maintenance vehicle pullout (MVP) area reconstruction, median barrier guard rail (MBGR) reconstruction, concrete barrier reconstruction, and sound wall/retaining wall construction/reconstruction.

Alternative 2B is similar to Alternative 2A, with the exception that the Main Street drop-ramp would be removed. The estimated total DSA is 7.55 acres.

Alternative 5A has a DSA of 3.19 acres and would involve outside shoulder widening at some locations, reconstruction of portions of the concrete barrier, partial pavement replacement, and construction of a new retaining wall at Lincoln Avenue.

Alternative 5B is similar to Alternative 5A, with the exception that the Main Street drop-ramp would be removed. The estimated total DSA is 3.77 acres.

The estimated total DSA for the SB I-5 on-ramp at Fourth Street Ramp Alternative A is 2.79 acres. This includes removal of existing SB I-5 on-ramp from First Street and construction of a new SB I-5 diagonal on-ramp from Fourth Street.

The estimated total DSA for the SB I-5 on-ramp at Fourth Street Ramp Alternative B is 2.15 acres. This includes removal of the existing SB I-5 on-ramp from First Street and construction of a new SB I-5 loop on-ramp from First Street.

The estimated DSA during construction for each of the alternatives of the proposed project is summarized in Table 1.

Table 1: Estimated Disturbed Soil Area for Build Alternatives

Alternative	Estimated Disturbed Soil Area (acres)
2A	8.18
2B	8.76
5A	3.19
5B	3.77
Ramp A	2.79
Ramp B	2.15

Without implementation of construction BMPs, construction of the proposed project has the potential to impact water quality. The types of activities described above for the different alternatives have the potential to release pollutants such as sediment, paints, herbicides, pesticides, landscaping, soil stabilization residues, detergents, wood preservatives, equipment fuels, lubricants, coolants, hydraulic fluids, cleaning solvents, trash, metals, etc. Any type of soil disturbance would expose soil to erosion from wind and water. Erosion can result in sedimentation that would ultimately flow into surface waters. However, with the implementation of minimization measure WQ-1, the potential for pollutant transport would be minimized.

Each of these alternatives will be accompanied by modernization of the existing storm drain infrastructure. Inlets and pipes will be relocated to accommodate the different roadway configurations and sized per regulatory requirements.

Though excavation would occur in several of the alternatives, dewatering is not expected to be needed since groundwater is 88 feet below ground level. Additionally, the modifications to the pump stations are not such that groundwater dewatering would be required.

Per the Construction General Permit, the proposed project's risk for sedimentation has been determined to be Level 2. Sediment yield is expected to be minor. Additionally, the receiving waters are not impaired for sediment.

The proposed project has the potential to impact flood control, as the project site is within various FEMA flood zones, including A (areas inundated by 100-year flooding, for which no BFEs have been established), X500 (areas inundated by the 500-year flood), and X (areas determined to be outside of the 100- and 500-year floodplains). The increase in impervious surface for the project would be minimal, and all runoff would be properly conveyed through pipes and ditches, and attenuated through bioretention swales.

To comply with the Construction General Permit, as stated in Measure WQ-1, the project would be required to do the following:

- Submit Permit Registration Documents, including submitting an electronic Notice of Intent and fee.
- Enroll the project for coverage under the Construction General Permit at least 14 days prior to the start of construction.
- Prepare a SWPPP that would include the following:
    - Implementing minimum erosion and sediment control BMPs.
    - Conducting routine inspections.
    - Conducting as-needed effluent and receiving-water monitoring commensurate with its project risk level.
    - Submitting an annual report to the SWRCB.
- Submit an electronic Notice of Termination.

If construction BMPs are properly designed, implemented, and maintained, as presented in minimization measure WQ-1, no adverse water quality impacts would be expected to occur during construction of the proposed project.

4.2.2 Long Term Impacts During Operation and Maintenance

4.2.2.1 No Build Alternative

Under the No Build Alternative, no increase in impervious area or change in land use would occur. Therefore, this alternative would not result in an increase in long-term pollutant loading; however, existing runoff would remain untreated.

4.2.2.2 Build Alternatives 2A, 2B, 5A, 5B, Option A, and Option B

As discussed in Section 1.1.2, Alternative 2A would result in a net increase of 1.45 acres of impervious area and would include outside shoulder widening, MVP area reconstruction, MBGR reconstruction, concrete barrier reconstruction, and sound wall/retaining wall construction/reconstruction.

Alternative 2B would be similar to Alternative 2A, with the exception that the Main Street drop-ramp would be removed. The estimated net increase of impervious area would be 1.45 acres.

Alternative 5A would result in a net increase of 0.65 acre of impervious area and would involve outside shoulder widening at some locations, reconstruction of portions of the concrete barrier, partial pavement replacement, and construction of a new retaining wall at Lincoln Avenue.

Alternative 5B would be similar to Alternative 5A, with the exception that the Main Street drop-ramp would be removed. The estimated net increase of impervious area would be 0.32 acre.

The Fourth Street Ramp Alternative A would decrease impervious area by 0.53 acre. This includes removal of the existing SB I-5 on-ramp from First Street and construction of a new SB I-5 diagonal on-ramp from Fourth Street.

The Fourth Street Ramp Alternative A would increase impervious area by 0.25 acre. This includes removal of the existing SB I-5 on-ramp from First Street and construction of a new SB I-5 loop on-ramp from First Street.

The net change in impervious area for each project alternative is shown in Table 2.

Table 2: Estimated New Impervious Area for Build Alternatives

Alternative	Estimated Net Impervious Area Increase (acres)
2A	1.45
2B	1.45
5A	0.65
5B	0.32
Ramp A	-0.53
Ramp B	0.25

The largest increase in impervious area caused by the project for any alternative is relatively small (less than 2%) compared to the urbanized area within the watershed.

Figure 6 shows the existing storm water drainage facilities, the direction of flow, and the dividing line for the two main receiving waters. The portion of the project north of the intersection of I-5 and 17th Street flows to the Santa Ana River and the areas south ultimately discharge to the San Diego Creek. These areas in the southern portion of the proposed project site discharge to Peters Canyon Wash via the Southwest Tustin Channel and the Santa Ana–Santa Fe Channel. Peters Canyon Wash discharges to the San Diego Creek. Furthermore, one pump station each is located at 1st Street, Lincoln Avenue, and Main Street (for a total of three) that lift storm water for continued conveyance through the existing drainage system. The receiving water for the Main Street pump station is the Santa Ana River. The 1st Street and Lincoln Avenue pump stations contribute to the San Diego Creek.

These pump stations were designed for the 50-year storm event and have sufficient storage capacity; effluent flow rates are determined by the pump rate and are not impacted by the amount of influent runoff. In other areas of the project site, existing storm water drainage systems are designed for 25-year storm events. The flow rates are summarized in Table 3. Options A and B are not included in Table 3 since runoff from the area drains into the pump station on 1st Street. The flow rates to the other areas were combined to show the collective flow into the receiving waters. There is no increase in runoff flow rates from the pumps, and only a slight increase in the flow rates discharging into the Santa Ana River from the other areas in Alternatives 2A, 5A, and 5B. However, this increase is relatively small and not expected to increase erosivity or sediment contribution to the Santa Ana River.

This page intentionally left blank.

Table 3: Estimated Flow Rates for Build Alternatives

Area of Project Site	Flow Rates for Alternatives (cfs)				
Santa Ana River	**Existing**	**2A**	**2B**	**5A**	**5B**
Main Street Pump (50-yr)	41.5	41.5	41.5	41.5	41.5
Other (25-yr)	161.3	162.4	162.3	161.4	161.4
San Diego Creek					
Lincoln Ave Pump (50-yr)	13.2	13.2	13.2	13.2	13.2
1st Street Pump (50-yr)	42.5	42.5	42.5	42.5	42.5
Other (25-yr)	33.1	33.1	33.1	33.1	33.1

Existing drainage systems will need to be modified for each of the design alternatives as follows:

- Relocate existing inlets/pipes to meet the new edge of shoulder when widening.
- Relocate existing inlets/pipes along median barrier in the event existing barriers are relocated.
- Install additional inlets/pipes along new median barriers, as necessary, if the new barrier impedes flow to the shoulder.
- Remove existing inlets/pipes along median barriers that are to be removed. Additional inlets will be installed at the edge of the shoulder to maintain water spread at the edge of shoulder to acceptable levels.
- Install new drainage system for the new ramps.

Operation of the project is subject to the requirements of Caltrans' NPDES permit. As part of these requirements, Caltrans must do the following:

- Consider approved design pollution prevention (DPP) and treatment control BMPs for the project site.
- Construct DPPs and treatment BMPs where feasible.

DPPs are permanent pollutant source control BMPs that should target the pollutants of concern (POCs). Also, treatment BMPs must be implemented to target the POCs in the storm water runoff from the project area.

POCs typically generated during the operation of a transportation project are sediment/turbidity, nutrients, organic compounds, trash and debris, oxygen-demanding substances, oil and grease, pesticides, and metals. In addition, the Santa Ana River is 303(d) listed for indicator bacteria and has WQO for TDS and nitrates. The DPP and treatment BMPs should focus on these pollutants to decrease the potential for further impairment.

There are currently no existing BMPs in the project area. A bioswale is proposed as the potential treatment BMP for the proposed project. Potentially, a bioswale could be located along I-5 between North Broadway and SR-22, near the northern limit of the project. Since the maximum added impervious area would be 1.45 acres, preliminary design indicates that a bioswale would be feasible for water quality treatment. Preliminary bioswale design dimensions suggest a 5-foot

bottom width, side slope of 4:1 (horizontal:vertical), a longitudinal slope of about 0.5%, and a length of approximately 110 to 200 feet. Several areas have been identified as potential sites for bioswales to treat a total of 4.02 acres.

Detailed design of this BMP and its location would be determined in the Plans, Specifications, and Estimates (PS&E) phase. Existing vegetation would not be disturbed whenever possible, and any mature trees to be saved would be identified on final plans. The final siting and design of treatment BMPs would be decided consistent with Caltrans' Stormwater Quality Project Planning and Design Guide during the PS&E phase of the proposed project.

Through complying with Caltrans' NPDES permit and the Statewide SWMP (minimization measure WQ-1), and implementing minimization measures WQ-2 through WQ-4 to the maximum extent practicable, designing and operating the project's facility would not be expected to cause adverse impacts to water quality.

4.3 Cumulative Impacts

The cumulative study area for water quality and storm water runoff is the Lower Santa Ana River Hydrologic Area and, more specifically, the East Coastal Plain Hydrologic Subarea within the Santa Ana River Watershed. Any drainage off of the project site would eventually drain into the Santa Ana River and the Pacific Ocean. The areas on both sides of I-5 within the project limits and the hydrologic area and subarea are fully developed. Land uses include single-family homes, medium-density residential, commercial, and business buildings.

The existing trend of urbanization in the Santa Ana River Watershed is projected to continue. Conversion of undeveloped land to transportation, commercial/industrial, retail, and residential uses results in hydromodification and increased loading of pollutants into surface waters and, indirectly, into groundwater. Urbanization also introduces new sources of pollutants associated with the new land uses. To counteract the impacts associated with increased development, each project proposed in this watershed must undergo review by the applicable lead agency for compliance with NPDES permits for construction activities, groundwater dewatering, and project operations, as well as compliance with local urban runoff ordinances. BMPs must be employed in site designs to reduce sources of pollutants and to treat storm water runoff. For projects within Caltrans jurisdiction, this includes compliance with the Caltrans SWMP and the local requirements of the Santa Ana RWQCB, as outlined in Section 2.3.

As discussed in Sections 2.2 and 2.3, the purpose of the NPDES permit program and, by extension, the TMDL program, is to restore the beneficial uses of receiving waters. NPDES permits are updated every 5 years by the Santa Ana RWQCB based on the conditions of the watershed. Compliance with the NPDES program is considered sufficient to mitigate impacts to water quality. Because the build alternatives include treatment measures that currently do not exist, and because the project would employ minimization measures WQ-1 through WQ-4 as outlined in Section 5, the project would improve runoff water quality in the project area and, therefore, would not contribute to cumulative water-quality impacts.

5. AVOIDANCE AND MINIMIZATION MEASURES

Caltrans' SWMP is the guidance for compliance with the NPDES permit requirement for discharge. As part of project delivery, described in the SWMP, selected construction site, design pollution prevention, and treatment control BMPs would be incorporated into the final design of the proposed project. Compliance with the standard requirements of the SWMP for potential short-term (during construction) and long-term (post-construction/maintenance) impacts (listed below in minimization measures WQ-1, WQ-2, WQ-3, and WQ-4) would be required.

WQ-1: The project shall comply with the Provisions of the Caltrans Statewide NPDES Permit (Order No. 2012-0011-DWQ, NPDES No. CAS000003), which becomes effective July 1, 2013, and the Construction General Permit (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ).

WQ-2: In accordance with the Construction General Permit, a SWPPP shall be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP shall identify the sources of pollutants that may affect the quality of storm water and include construction site BMPs to control pollutants and sediment and provide for catch basin inlet protection, construction materials management, and non-storm-water BMPs. All construction site BMPs shall follow the latest edition of the Storm Water Quality Handbooks: Construction Site Best Management Practices (BMPs) Manual to control and minimize the impacts of construction-related activities, materials, and pollutants on the watershed. These include temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-storm-water BMPs.

WQ-3: Caltrans-approved treatment BMPs shall be implemented to the maximum extent practicable, consistent with the requirements of the NPDES permit, Statewide Storm Water Permit, and WDRs for Caltrans' properties, facilities, and activities (Order No. 2012-0011-DWQ) and the Orange County MS4 Permit, Order R8-2009-0030 (amended by Order R8-2010-0062).

WQ-4: Design pollution prevention BMPs shall be implemented, such as preservation of existing vegetation; slope/surface protection systems (permanent soil stabilization); concentrated flow conveyance systems such as ditches, berms, dikes, and swales; overside drains; flared end sections; and outlet protection/velocity dissipation devices.

This page intentionally left blank.

6. REFERENCES

6.1 Works Cited

AECOM

2012 Draft Natural Environment Study, I-5 HOV Lanes Improvement Project (SR-55 and SR-57). District 12-OC-I-5-[KP] PM 29.1 to 34.

California Department of Transportation (Caltrans)

2003 Statewide Storm Water Management Plan (SWMP). CTSW-RT-02-008. May.

County of Orange

1986 Hydrology Manual. October. Available at http://www.ocflood.com/Docs_Online_Manuals.aspx. Accessed August 28, 2011.

2003 Drainage Area Management Plan. July 1. Available at http://www.ocwatersheds.com/DAMP_MapPlan.aspx. Accessed August 23, 2011.

2011 Checklist for Categorizing Development and Significant Redevelopment Projects As "Priority" or "Non-Priority." Available at http://www.ocplanning.net/Documents/pdf/Checklist_for_Categorizing_Priority_or_Non_Priority_FINAL_May_19_2011.pdf. Accessed August 24, 2011.

Orange County Coastkeeper

2004. Santa Ana River Citizens Water Monitoring Project-Final Report. November 2. Available at http://www.iewaterkeeper.org/backend/PDF/FinalReport1003.pdf Accessed July 26, 2012.

Santa Ana Regional Water Quality Control Board (RWQCB)

2004 Watershed Management Initiative Chapter. November. Available at http://www.swrcb.ca.gov/rwqcb8/water_issues/programs/wmi/docs/2004_wmi_rb8_2.pdf. Accessed July 26, 2012.

2011a Board Approved of 2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed July 25 2012.

2011b Water Quality Control Plan Santa Ana River Basin (8). June.

U.S. Department of Agriculture Soils Conservation Service and Forest Service (USDA)

1978 Soil Survey of Orange County and Western Part of Riverside County, California.

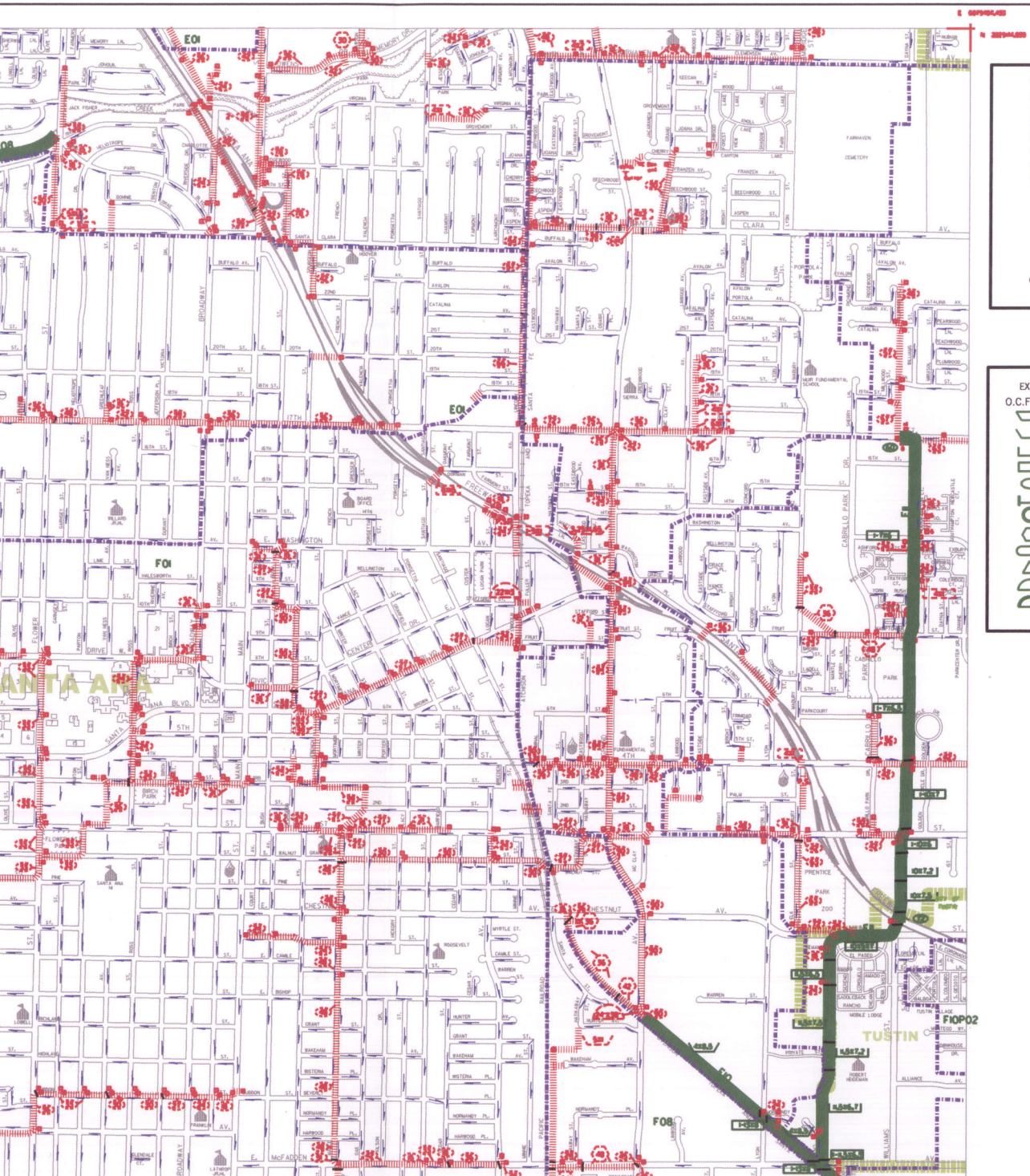
U.S. Geologic Survey (USGS)

2004 Water Quality in the Santa Ana Basin, California, 1999–2001. Available at http://pubs.usgs.gov/circ/2004/1238/pdf/circular1238.pdf. Accessed July 26, 2012.

6.2 Preparer(s) Qualifications

Yvana Kuhn, P.E., is a civil and environmental engineer with 8 years of professional experience. Ms. Kuhn received her Bachelor's in Science and Engineering from the University of Michigan, Ann Arbor in 2002. Ms. Kuhn then received her Master's in Environmental Science and Management from the Donald Bren School of Environmental Science and Management at the University of California, Santa Barbara in 2006. She has Professional Engineer licenses in both California and Michigan.

Ms. Kuhn's experience includes environmental analyses and project management pertaining to hydrology and water quality studies, storm and sanitary sewer and water distribution layout and design, and storm water management. Ms. Kuhn has prepared documents such as environmental impact reports, permit applications, erosion control manuals, water quality technical reports, Caltrans Water Quality Assessments and Storm Water Data Reports, and SWPPPs.



- Channel Drainage Area Boundary
- Major Sub–Area Drainage Boundary
- Minor Sub–Area Drainage Boundary
- Existing O.C.F.C.D. Facility
- Existing Local Facility
- Existing Retarding Basin or Reservoir
- Natural Watercourse
- City Limits
- G G — Greenbelt
- P.S. P.S. — Pump Station
- Catch Basin (length in feet)
- Drop Inlet or Other Entry
- OCFCD Basins or Reservoirs

Ownership (If other than City or County): Private = P State = S Federal = F

EXISTING FACILITIES

O.C.F.C.D.	LOCAL	
		Earth Trapezoidal Channel (base width by height in feet)
		Reinforced Concrete Trapezoidal Channel (base width by height in feet)
		Reinforced Concrete Rectangular Channel (base width by height in feet)
		Reinforced Concrete Box (RCB) (number of barrels–span by height in feet)
		Reinforced Concrete Pipe (RCP) (diameter in inches)
		Metal Sheet Channel (MSC) (Base width by pile height in feet/Sheet pile total length)
		Corrugated Metal Pipe (CMP) (diameter in inches)
		Concrete Pipe (diameter in inches)
		Concrete Oval Pipe (width by height in inches)
		Steel Pipe (diameter in inches)
		Reinforced Concrete Arch (base span by height in inches)
		Corrugated Metal Arch (base span by height in inches)