

BOULDER AVENUE BRIDGE REPLACEMENT



WATER QUALITY ASSESSMENT REPORT

CITY OF HIGHLAND

SAN BERNARDINO COUNTY, CALIFORNIA

**08-SBd-0-HLD
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LIST OF ACRONYMS AND ABBREVIATIONS

AGR	Agricultural Supply
Basin Plan	Santa Ana RWQCB Water Quality Control Plan
BAT	Best Available Technology
BCT	Best Control Technology
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
City	City of Highland
COD	Chemical Oxygen Demand
COLD	Cold Freshwater Habitat
Corps	United States Army Corps of Engineers
CWA	Clean Water Act
DBCP	dibromochloropropane
Department	California Department of Transportation District 8
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
GWR	Groundwater Recharge
IND	Industrial Supply
LOS	level of service
MEP	maximum extent practicable
mg/l	milligrams per liter
MS4	Municipal Separate Storm Sewer System
MUN	Municipal and Domestic Supply
N	nitrogen
NAWQA	National Water Quality Assessment
NO ₃	nitrate
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NWP	Nationwide Permit
PCE	tetrachloroethylene
PCN	Pre-construction Notification
PR	Project Report
PROC	Industrial Process Supply
Ps	Psammets and Fluvents
PS&E	Plans, Specifications, and Estimates
PSR	Project Study Report
RARE	Rare, Threatened, or Endangered Species
REC-1	Water Contact Recreation
REC-2	Non-contact Water Recreation

RTIP	Regional Transportation Improvement Program
RWQCB	Regional Water Quality Control Board
SER	Standard Environmental Reference
SoC	Soboba Gravelly Loamy Sand, 0 to 9 percent slopes
SpC	Soboba Stony Loamy Sand, 2 to 9 percent slopes
SPWN	Spawning, Reproduction, and Development
SWMP	Storm Water Management Plan (Caltrans)
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCE	trichloroethylene
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TvC	Tujunga Gravelly Loamy Sand, 0 to 9 percent slopes
µg/l	micrograms per liter
USGS	United States Geological Survey
WDR	Waste Discharge Requirements
WILD	Wildlife Habitat

EXECUTIVE SUMMARY

The proposed project consists of the reconstruction of the Boulder Avenue Bridge located within the City of Highland over the City Creek Wash and the widening of Boulder Avenue from 190 feet north to 1,430 feet south of the Boulder Avenue Bridge from two lanes to four lanes for the purpose of enhancing traffic operations, reducing existing traffic congestion, and the remediation of the bridge's integrity from existing scouring conditions. The California Department of Transportation, District 8 (Department) is required to incorporate water quality controls into a project during the Project Study Report (PSR); Project Report (PR); and Plans, Specifications, and Estimates (PS&E) phases of project development. The Storm Water Management Plan (SWMP) provides the framework for management of storm water discharges and water quality controls. Storm water quality controls that are applied are either temporary (during construction) or permanent (after construction and part of operation of the project).

The construction Storm Water Pollution Prevention Plan (SWPPP) identifies the specific best management practices (BMPs) to be implemented during project construction so as not to cause or contribute to an exceedance of any applicable water quality standard contained in a Statewide Water Quality Control Plan and/or the applicable Santa Ana Regional Water Quality Control Board's (RWQCB) Basin Plan. These BMPs are designed to meet the technology requirement as stipulated in the Caltrans National Pollution Discharge Elimination System (NPDES) permit.

As part of the Caltrans Maintenance Storm Water Management Program, BMPs will be implemented to minimize potential storm water pollution from accidental spills, illicit connections, and illegal discharges and dumping. As appropriate, illegal discharges and dumping are reported to local enforcement agencies when discovered.

The replacement of the existing bridge and the street widening associated with the proposed project are anticipated to increase impervious areas at the project site, increasing the amount of runoff from Boulder Avenue. It is anticipated that the proposed project's effect on the velocity or volume of downstream flow will be negligible. There will be no change in existing land use with implementation of the project, and no new sources of pollutants are anticipated.

As part of the project approval process, selected Design Pollution Prevention and Treatment BMPs will be incorporated into the design of the reconstruction of the Boulder Avenue Bridge, where feasible. Applicable construction site BMPs are required during construction activities, and maintenance BMPs will be implemented during operation of the reconstructed bridge and widened roadway. These BMPs will be implemented so as to meet or exceed the requirements of the Statewide NPDES permit.

1.0 INTRODUCTION

This chapter provides a description of the proposed project and alternatives as well as the approach to the Water Quality Assessment in evaluating the potential impacts related to project implementation.

1.1 PURPOSE AND NEED

The City of Highland (City), in cooperation with the Department and the Federal Highway Administration (FHWA), proposes to improve the Boulder Avenue crossing over City Creek. The purpose of the project is to improve the operation of the existing bridge and local circulation, enhance safety, alleviate existing level of service (LOS) deficiencies, accommodate projected future traffic volumes within the project vicinity, remediate the bridge's integrity from existing scouring conditions, and to update the bridge's Sufficiency Rating (SR) of 47.8, which has a designation of structurally deficient, to a sufficiency rating that is structurally efficient. The primary geometric constraint at the project site is the transition from a four-lane roadway to a two-lane roadway on the existing Boulder Avenue Bridge. The reduction of the roadway to two (2) lanes through this portion of Boulder Avenue results in a bottlenecking of traffic and contributes to roadway congestion in the project area. Implementation of the proposed replacement of the Boulder Avenue Bridge and widening of Boulder Avenue is necessary to maintain the City of Highland's LOS standard.

1.2 PROJECT DESCRIPTION

The proposed project's regional location and vicinity are shown in Figure 1 and the conceptual improvement plan for the project is provided in Appendix A. The proposed project would replace the existing two-lane Boulder Avenue Bridge with a four-lane structure and widen both the northern and southern approaches to match the existing configuration of Boulder Avenue north and south of the project limits. The proposed project would also include the construction of street improvements (e.g., curbs, gutters, sidewalks, and decorative lighting); the extension, relocation, and/or modification of drainage features; and the relocation (as necessary) of utility features. In addition to the bridge replacement, an extension of an existing multi-function trail (pedestrian, bicycle, and equestrian use) will be incorporated into the project design for possible future connection with the Santa Ana River Trail. The project limits on Boulder Avenue are limited to approximately 0.14 mile south of Baseline Street at the City Creek crossing.

The project objectives are to (1) implement roadway improvements consistent with the Circulation Element of the City of Highland General Plan; (2) implement improvements that will enhance traffic operations and reduce existing traffic congestion on Boulder Avenue by improving the LOS, especially at the Boulder Avenue Bridge; (3) improve the design speed of the Boulder Avenue Bridge overcrossing; and (4) replace a structurally deficient bridge. According to the City of Highland's General Plan Circulation Element, Boulder Avenue is identified as a modified primary arterial north of Greenspot Road. This modified primary arterial is designated as a four-lane divided roadway plus a Class I bike lane, with a typical right-of-way width of 135 feet and a curb-to-curb pavement width of approximately 98 feet with a raised median.

Figure 1: Project Vicinity Map

Boulder Avenue has previously been widened to four (4) lanes with the exception of the existing Boulder Avenue Bridge and the roadway approaches from 190 feet north and to 1,430 feet south of the existing bridge. The transition from a four-lane roadway to a two-lane roadway on the existing Boulder Avenue Bridge results in a bottlenecking of traffic and contributes to roadway congestion in the project area. To resolve the existing condition, the replacement of the existing two-lane bridge with a four-lane bridge, along with the proposed improvements, would tie into existing improvements on both ends of the project limits. As currently proposed, the project will require the acquisition of additional right-of-way that would be for temporary construction easements and/or utility relocations.

The project is included in the Final Adopted 2004 Regional Transportation Improvement Program (RTIP) for engineering and reconstruction of Boulder Avenue Bridge across City Creek south of Baseline from two to four lanes along with the widening of Boulder Avenue from 190 feet north to 1,430 feet south of the existing bridge from two to four lanes (Project ID No. 200018). Construction is scheduled for early 2009 through 2010. The project will be constructed in accordance with the Caltrans Standard Construction Specifications, which include measures to reduce noise and air pollution emissions during construction.

1.3 APPROACH TO WATER QUALITY ASSESSMENT

The purpose of this Water Quality Assessment Report is to determine whether reconstruction of the Boulder Avenue Bridge and widening of Boulder Avenue would have an adverse impact on water quality based on the proposed build alternatives. The determination of impacts is based on the anticipated change in pollutant sources due to changes in land use, and changes in the impervious area percentage between the existing condition and the post-project condition. The analysis includes consideration of BMPs to be implemented as part of the project. This assessment also discusses existing water quality regulations and Department methods of complying with those regulations. The report has been prepared in accordance with the Department's Standard Environmental Reference (SER) for Water Quality Reports. The SER applies to all transportation projects developed under the auspices of the Department and to all local agency highway or local streets and roads projects with funding or approval by the FHWA.

The purpose of the SER is to provide a single, standard reference on compliance with related Federal laws, executive orders, regulations, and policies. The reference is intended for Statewide use by local agencies, Caltrans, and FHWA staff. In accordance with the SER "Content and Recommended Format" for technical water quality studies, this report addressed the following:

- *Affected Environment* includes overview of geography, topography, surface and ground waters;
- *Regulatory Setting* includes overview of existing water quality and regional water quality objectives;
- *Environmental Consequences* addresses potential construction and long-term operational effects of the proposed project on area water quality including an assessment of site-specific and cumulative impacts; and
- *Avoidance, Minimization and/or Mitigation Measures* recommends mitigation measures for potentially significant water quality impacts and provides determination of significance subsequent to implementation of recommended measures.

2.0 AFFECTED ENVIRONMENT

2.1 SURFACE WATER RESOURCES

In the City, drainage flows from north to south and from east to west. The proposed project would include activities in two drainage features, City Creek and Bledsoe Creek. City Creek flows from the northeast and crosses beneath the existing bridge before continuing in a southwest direction. Bledsoe Creek flows from the northwest and crosses the southernmost boundary of the project before continuing in a southwest direction. Based on the Environmental Site Assessment¹ conducted for the proposed project, the drainage pattern of the project site consists of surface flow from the existing Boulder Avenue and Boulder Avenue Bridge flowing into City Creek and Bledsoe Creek via existing stormwater conveyance features. Bledsoe Creek flows to City Creek and City Creek flows converge with Plunge Creek before joining the Reach 5 of the Santa Ana River in the City of San Bernardino, approximately 3.37 kilometers (2.0 miles) southwest from the project site. The Santa Ana River flows west through Riverside County and Orange County and ultimately drains to the Pacific Ocean.

City Creek flows through the project area in a northwest to southwest direction and acts as a major natural drainage facility for the City of Highland. Bledsoe Creek flows through the project area's southernmost boundary and acts as a natural drainage feature for the City of Highland. Flows along City Creek fluctuate from year to year between wet and dry periods. Flows within Bledsoe Creek are intermittent and also fluctuate between wet and dry periods. Elevations at the project site range from approximately 367 to 396 meters (1,205 to 1,300 feet) above sea level. The topography is relatively flat around the existing bridge and the primary features are the slope embankments for the overcrossing.

2.1.1 Floodplains

Most of the annual rainfall in the region occurs in the winter. Flooding in the City of Highland could result from intense storms resulting in rapid runoff or through the failure of the Seven Oaks Dam along the Santa Ana River. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) identify areas subject to flooding during the 100-year storm.² Based on these FIRMs, the project site is within a 100-year flood zone.³

2.2 GROUNDWATER RESOURCES

The project site is located in the Bunker Hill II Groundwater Basin within the larger Upper Santa River Groundwater Basin. Groundwater in the project area can be found at a depth of approximately

¹ *Environmental Site Assessment Boulder Avenue Bridge at City Creek, Highland California, EA No. 08-924830*, Diaz-Yourman & Associates, March 23, 2006.

² The term "100-year" is a measure of the size of the flood, not how often it occurs. The "100-year flood" is a flooding event that has a one percent chance of occurring in any given year.

³ FEMA Q3 Flood Data, 1996.

150 to 200 feet below the ground surface and flows in a west-southwest direction.¹ Parched groundwater conditions occur when there is flow in City Creek. The project site, located in the City of Highland, within San Bernardino County is not located in or near any of the existing or proposed sole-source aquifers in the State, which are located in Fresno, Santa Cruz, Butte, and Imperial Counties.

2.3 SOILS/EROSION POTENTIAL

As summarized in Table A, soils are classified by the United States Natural Resource Conservation Service into four (4) Hydrologic Soils Groups based on the soil’s runoff potential. Hydrologic Soil Group is a term that represents a group of soils having similar runoff potential under similar storm and cover conditions. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonally high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate.²

Table A: Hydrologic Soil Group Characteristics

Hydrologic Soil Group	Soil Type	Soil Characteristics
Group A	Sand, Loamy Sand, Sandy Loam	Low runoff potential and high infiltration rates even when thoroughly wetted. Consists of deep, well to excessively drained sands or gravels and have a high rate of water transmission.
Group B	Silt Loam, Loam	Moderate infiltration rate when thoroughly wetted. Consists of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures.
Group C	Sandy Clay Loam	Low infiltration rates when thoroughly wetted. Consists of soils that contain a layer that impedes downward movement of water and soils with moderately fine to fine textures.
Group D	Clay Loam, Silty Clay Loam, Sandy Clay, Silty Clay, Clay	Very low infiltration rates when thoroughly wetted. Consists of clay soils with high swelling potential, soils with a permanent high water table, soils with a clay layer at or near the surface and shallow soils over nearly impervious material.

Source: Natural Resources Conservation Service, 2007.

The project site contains four different types of soils: Psammments and Fluvents (Ps), Soboba Gravelly Loamy Sand, 0 to 9 percent slopes (SoC), Soboba Stony Loamy Sand, 2 to 9 percent slopes (SpC), and Tujunga Gravelly Loamy Sand, 0 to 9 percent slopes (TvC). As indicated in Table A, soils belonging to Hydrologic Soil Group A have a low runoff potential and high infiltration rate when thoroughly wetted. All soils found on-site are considered to be part of Hydrologic Soil Group A and are considered to have a low runoff or erosion potential.

¹ *Environmental Site Assessment Boulder Avenue Bridge at City Creek, Highland California, EA No. 08-924830*, Diaz-Yourman & Associates, March 23, 2006.

² Natural Resources Conservation Service, United States Department of Agriculture, <http://www.nrcs.usda.gov/>, website accessed February 28, 2007.

2.4 REGULATORY SETTING

Discharges into waters of the U.S. are subject to the regulatory authority of the U.S. Army Corps of Engineers (Corps) under Section 404 of the Federal Clean Water Act (CWA); the State Water Resources Control Board (SWRCB) and the applicable RWQCB under Sections 303, 401, and 402 of the CWA and the California Porter-Cologne Water Quality Act; and by the California Department of Fish and Game (CDFG) under Sections 1601–1603 of the California Fish and Game Code.

2.4.1 Federal Requirements of the Clean Water Act

Section 303. Section 303 of the CWA requires that the State adopt water quality objectives for surface waters. The Santa Ana RWQCB Water Quality Control Plan (Basin Plan) contains water quality objectives that are considered necessary to protect the specific beneficial uses it identifies. Section 303(d) specifically requires the State to develop a list of impaired water bodies and subsequent numeric Total Maximum Daily Load (TMDLs)¹ for any constituents that impair a particular water body. These constituents include inorganic and organic chemical compounds, metals, sediment, and biological agents.

City Creek and Bledsoe Creek are not listed as impaired² pursuant to Section 303 of the CWA.

Section 401. Section 401 of the CWA specifies that any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities that may result in any discharge into navigable waters, shall provide the Federal licensing or permitting agency a certification from the State in which the discharge originates or will originate from the State agency with jurisdiction over those waters (Santa Ana RWQCB) that the project will comply with water quality standards, including beneficial uses, water quality objectives, and the state anti-degradation policy.

The proposed project would require construction activities within City Creek, which is identified as an active stream channel. Because City Creek is subject to the Corps jurisdiction under Section 404 of the CWA, a Section 401 water quality certification is required. The proposed project would also include the extension of a concrete box culvert in Bledsoe Creek. Because this includes construction activity that could result in a discharge to receiving waters, a Section 401 water certification is required.

Section 402. Direct discharges of pollutants into waters of the U.S. are not allowed, except in accordance with the NPDES program established in Section 402 of the CWA. The main goal of the NPDES program is to protect human health and the environment. Pursuant to the NPDES program,

¹ The TMDL is the total amount of a constituent that can be discharged while meeting water quality objectives and protecting beneficial uses. It is the sum of the individual load allocations for point source inputs (e.g., an industrial plant); load allocations for nonpoint source inputs (e.g., runoff from urban areas); and natural background, with a margin of safety.

² *Proposed 2006 CWA Section 303(d) List of Water Quality Limited Segments*, California State Water Board, http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/final/state_final303dlist.pdf, website accessed February 28, 2007.

permits that apply to storm water discharges from municipal storm drain systems, specific industrial activities, and construction activities (1 acre or more) have been issued. NPDES permits establish enforceable effluent limitations on discharges, require monitoring of discharges, designate reporting requirements, and require the permittee to perform BMPs. Industrial (point-source) storm water permits are required to meet effluent limitations; municipal permits are governed by the maximum extent practicable (MEP) or the Best Available Technology (BAT)/Best Control Technology (BCT) application of BMPs.

Section 404. The Corps regulates discharges or fills into waters of the U.S. under Section 404 of the CWA via the Nationwide Permit (NWP) or Individual Permit program. There are several categories of NWPs, which can be utilized for projects that fall under specific categories. A Pre-construction Notification (PCN) to the Corps district engineer is required for most activities that result in the loss of greater than 0.1 acre of waters of the U.S. The Corps reviews the PCN on a case-by-case basis to determine whether the adverse effects of the proposed work on the aquatic environment are minimal. The Corps will also determine whether a particular drainage is considered waters of the U.S. and subject to regulation under Section 404.

As identified by the City of Highland, City Creek is considered to be a “Water of the U.S.”¹ Because the Corps regulates discharges of dredged or fill material into waters of the U.S., a Section 404 permit is required for any filling or dredging within waters of the U.S. The proposed project includes construction activities that would result in a discharge of materials into a water of the U.S. and would require the issuance of a Section 404 permit by the Corps.

2.4.2 State Water Quality Regulations

Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code). The Porter-Cologne Act establishes a regulatory program to protect water quality and to protect beneficial uses of State waters. It requires that any person proposing to discharge wastes that could affect the quality of “waters of the State” file a Report of Waste Discharge to the appropriate RWQCB. The RWQCB then either issues Waste Discharge Requirements (WDRs) or a waiver for WDRs. Unlike the CWA, “waters of the State” are defined in the California Water Code as including both ground waters and surface waters located within the boundaries of the State. In March 2003, the SWRCB began requiring NPDES permit compliance for discharge from construction activities that disturb 1 or more acres of soil. In the proposed project area, permits that govern and restrict the amount of pollutants that can be discharged into ground or surface waters are issued by the Santa Ana RWQCB.

The Porter-Cologne Water Quality Control Act also requires each RWQCB to adopt a Water Quality Control Plan or Basin Plan. The Basin Plan designates beneficial uses in the basin, established water quality objectives, contains programs of implementation needed for achieving water quality objectives, and references the plans and policies adopted by the SWRCB. Each RWQCB establishes water quality objectives that will ensure the reasonable protection of beneficial uses and the

¹ “Jurisdictional Waters and Wetlands,” Chapter 5.4 Biological Resources, *City of Highland General Plan Update Draft Environmental Impact Report*, <http://www.ci.highland.ca.us/EIR/Ch%2005-04%20BIO.pdf>, website accessed February 28, 2007.

prevention of nuisances. The Water Code provides flexibility for some change in water quality, provided that beneficial uses are not adversely affected.

California Fish and Game Code Sections 1601–1603. CDFG, through provisions of the California Fish and Game Code (Sections 1601–1603), is empowered to issue agreements for any alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. Streams and rivers are defined by the presence of a channel bed and banks and at least an intermittent flow of water. CDFG typically extends the limits of its jurisdiction laterally beyond the channel banks for streams that support riparian vegetation. In these situations, the outer edge of the riparian vegetation is generally used as the lateral extent of the stream and CDFG jurisdiction.

The California Fish and Game Code Section 1602 requires any person, State or local governmental agency, or public utility to notify the CDFG before beginning any activity that will result in one or more of the following: (1) substantially obstruct or divert the natural flow of a river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. The Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State.¹

The proposed project includes the construction of improvements within the City Creek channel to protect new bridge abutments; therefore, a Section 1602 Streambed Alteration Agreement will be required for impact to the City Creek Channel. Additional concrete surfaces would be added to Bledsoe Creek as a result of the extension of the box culvert. Because the addition of concrete surfaces is a change of material within the channel of Bledsoe Creek and because construction activities would be required to extend the box culvert, a Section 1602 Streambed Alteration Agreement would also be required for Bledsoe Creek.

2.4.3 Regional and Local Water Quality Regulations

NPDES permits for construction activities and the Municipal Separate Storm Sewer System (MS4) are enforced at the regional level by the RWQCBs. Permits relevant to the proposed project include the Statewide Construction Activity General Permit (NPDES Permit No. CAS000002) and the San Bernardino County MS4 Permit (NPDES Permit No. CAS618036), of which the City of Highland is a permittee. It is anticipated that the City of Highland will file a Notice of Intent (NOI) to comply with the Construction Activity General Permit and not the Caltrans Permit (NPDES No. CAS000003) because the Boulder Avenue Bridge is a City facility.

Statewide Construction Activity General NPDES Permit Requirements. The Construction General Permit requires all discharges where construction activity disturbs 1 acre or more to:

¹ *Lake and Streambed Alteration Program, Questions and Answers*, <http://www.dfg.ca.gov/1600/qa.html>, website accessed February 27, 2007.

- Develop and implement an SWPPP that specifies BMPs to prevent construction pollutants from making contact with storm water and with the intent of keeping all products of erosion from moving off-site into receiving waters;
- Eliminate or reduce non-storm water discharges to MS4s and other waters; and
- Perform inspections of all BMPs.

The discharger (the City of Highland) must submit an NOI to the Santa Ana RWQCB, and obtain Construction General Permit coverage prior to any soil disturbance. Coverage under this permit would not commence until the discharger develops an adequate SWPPP for the project. The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The SWPPP's major objectives are to:

- Identify all pollutant sources, including sources of sediment, from the construction site;
- Identify non-storm water discharges;
- Construct and implement BMPs to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges; and
- Develop a maintenance schedule for all post-construction BMPs designed to reduce or eliminate pollutants.

The Construction General Permit requires development and implementation of a monitoring program. The program must be implemented at the start of construction activity and must include inspections that:

- Identify areas contributing to storm water discharge;
- Evaluate whether BMPs identified in the SWPPP are adequate and functioning properly; and
- Evaluate whether additional control practices or corrective maintenance activities are needed.

San Bernardino County MS4 NPDES Permit Requirements. San Bernardino County's Municipal Storm Water permit requirements fall under NPDES Permit No. CAS618036. The primary objectives of the local storm water program requirements are to (1) effectively prohibit non-storm water discharges, and (2) reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard). The primary goal of the MS4 permit is to stop polluted discharges from entering the storm drain system and local receiving waters.

Statewide Caltrans NPDES Permit Requirements. In 1996, Caltrans requested that the SWRCB consider adopting a single NPDES for all activities, properties, and facilities that would cover both the MS4 requirements and the Statewide Construction General Permit requirements. The permit is intended to cover all Caltrans activities that require a current MS4 permit and construction activities that require a Federal permit.

In its request for a single NPDES permit, Caltrans created a Storm Water Management Program (SWMP). The intent of the SWMP was to reduce or prevent pollutants in storm water discharge and authorized non-storm water discharges through the development and implementation of BMPs. The SWMP must also comply with the local MS4 Storm Water Permit for the region in which the project is located. The BMPs chosen must comply with either MEP or BAT/BCT standards, whichever is applicable. The intent of the combined permit is to ensure consistency with State construction-related requirements and MS4 requirements. Because Boulder Avenue Bridge is a City-owned facility, it is anticipated that the City will file notices of intent to comply with the Construction Activity General Permit and the San Bernardino County MS4 Permit, and not the Caltrans Permit (NPDES No. CAS000003).

Drainage and Flood Control Improvements. Drainage and flood control structure and improvements in the County of San Bernardino are subject to review and approval by the County of San Bernardino Flood Control District, while structures and improvements in the City of Highland are subject to review and approval by the City of Highland Department of Public Works. In general, the County maintains the large regional channels and smaller storm drains are maintained by the City. Both agencies utilize design standards to provide a specified level of protection against flooding for different types of land use and regulate drainage-related improvements through plan approvals and permits. The City requires project proponents to design storm water collection and conveyance systems using specifications and procedures set forth in their respective storm drain design manuals. Methods for reducing impacts to the storm drain/flood system can include controlling peak and total discharge through storm water detention or by increasing site perviousness.

2.5 BENEFICIAL USES

Beneficial uses of water are defined in the Santa Ana RWQCB's Basin Plan as those necessary for the survival or well being of humans, plants, and wildlife. Examples of beneficial uses include drinking water supplies, swimming, industrial and agricultural water supply, and the support of freshwater and marine habitats and their organisms.

2.5.1 Beneficial Uses for Surface Waters

Beneficial uses of water are defined in the Basin Plan as those necessary for the survival or well being of humans, plants, and wildlife. Examples of beneficial uses include drinking water supplies, swimming, industrial and agricultural water supply, and the support of freshwater and marine habitats and their organisms. Drainage from the site is currently and would continue to be discharged into City Creek and Bledsoe Creek. Santa Ana RWQCB-designated beneficial uses for these water features are summarized in Table B.

Table B: Designated Beneficial Uses for Project Receiving Waters

Beneficial Use Description	City Creek	Bledsoe Creek
Agricultural Supply (AGR): Waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.	X	NA
Cold Freshwater Habitat (COLD): Waters that support cold water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.	X	I
Groundwater Recharge (GWR): Waters used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality, or halting of saltwater intrusion into freshwater aquifers.	X	I
Non-contact Water Recreation (REC-2): Waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. Uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.	X	I
Municipal and Domestic Supply (MUN): Waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.	X	I
Rare, Threatened or Endangered Species (RARE): Waters that support habitats necessary for the survival and successful maintenance of plant or animal species designated under State or Federal law as rare, threatened or endangered.	X	NA
Spawning, Reproduction, and Development (SPWN): Waters that support high quality aquatic habitats necessary for reproduction and early development of fish and wildlife.	X	NA
Water Contact Recreation (REC-1): Waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. Uses include, but are not limited to, swimming, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.	X	I
Wildlife Habitat (WILD): Water that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.	X	I

X: Present or Potential Beneficial Use I: Intermittent Beneficial Use NA: Not Applicable
Source: *Water Quality Control Plan, Santa Ana River Basin (8)*, Santa Ana Regional Water Quality Control Board, 1995.

2.5.2 Beneficial Uses for Groundwater

The project site is located in the Bunker Hill II Groundwater Basin within the larger Upper Santa River Groundwater Basin. Beneficial uses for groundwater in the Bunker Hill II Groundwater Basin are summarized in Table C.

Table C: Designated Beneficial Uses for the Bunker Hill II Groundwater Basin

Beneficial Use	Description
Agricultural Supply (AGR)	Waters used for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, and support of vegetation for range grazing.

Table C: Designated Beneficial Uses for the Bunker Hill II Groundwater Basin

Beneficial Use	Description
Industrial Process Supply (PROC)	Waters used for industrial activities that depend primarily on water quality, which include process water supply and all uses of water related to product manufacture or food preparation.
Industrial Service Supply (IND)	Waters used for industrial activities that do not depend primarily on water quality such as mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well re-pressurization.
Municipal and Domestic Supply (MUN)	Waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Source: *Water Quality Control Plan, Santa Ana River Basin (8)*, Santa Ana Regional Water Quality Control Board, 1995.

2.6 WATER QUALITY OBJECTIVES

As required by the Porter-Cologne Act, the Santa Ana RWQCB has developed water quality objectives for waters within its jurisdiction to protect the beneficial uses of those waters and has published them in the Basin Plan. The Basin Plan also establishes implementation programs to achieve these water quality objectives and requires monitoring to evaluate the effectiveness of these programs. Water quality objectives must comply with the State anti-degradation policy (State Board Resolution No. 68-16), which is designed to maintain high-quality waters while allowing some flexibility if beneficial uses are not unreasonably affected.

2.6.1 Surface Water Quality Objectives

Surface water quality objectives for City Creek and Bledsoe Creek are listed in Table D.

Table D: Surface Water Quality Objectives for Project Receiving Waters

Constituent	Concentration
Algae	Shall not contribute to excessive algal growth in inland surface receiving waters.
Ammonia (Un-ionized)	Shall not exceed 4-day average concentration standards listed in Table 4-2 of Basin Plan for COLD beneficial use designation.
Boron	Shall not exceed 0.75 mg/l as a result of controllable water quality factors.
Cadmium	Shall not exceed 4 µg/l as a result of controllable water quality factors.
Chemical Oxygen Demand (COD)	Shall not exceed 5 mg/l as a result of controllable water quality factors.
Chloride	Shall not exceed 10 mg/l as a result of controllable water quality factors.
Chlorine (Residual)	Shall not exceed 0.1 mg/l as a result of controllable water quality factors.
Coliform (Total)	Shall not exceed 100 organisms/100 ml for MUN beneficial use designation.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses.
Copper	Shall not exceed 37 µg/l as a result of controllable water quality factors.

Table D: Surface Water Quality Objectives for Project Receiving Waters

Constituent	Concentration
Dissolved solids (Total)	Shall not exceed 200 mg/l as a result of controllable water quality factors.
Floatables	Shall not contain floating materials, including solids, liquids, foam, or scum, which cause a nuisance or adversely affect beneficial uses.
Fluoride	Shall not exceed 0.7 to 1.2 mg/l as a result of controllable water quality factors depending on air temperature (refer to Basin Plan) for MUN beneficial use designation.
Hardness (as Calcium Carbonate)	Shall not exceed 115 mg/l in City Creek and 110 mg/l in Bledsoe Creek as a result of controllable water quality factors.
Lead	Shall not exceed 28 µg/l as a result of controllable water quality factors.
Methylene blue-activated substances	Shall not exceed 0.05 mg/l for MUN beneficial use designation.
Nitrate-Nitrogen	Shall not exceed 45 mg/l (as nitrate [NO ₃]) or 10 mg/l (as nitrogen [N]) in inland surface water designated MUN as a result of controllable water quality factors.
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that cause a nuisance or adversely affect beneficial uses.
Oxygen (Dissolved)	Shall not be depressed below 6 mg/l for waters designated COLD, as a result of controllable oxygen concentrations.
pH	The pH of inland surface waters shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.
Radioactivity	Radioactive materials shall not be present in the waters of the region in concentrations which are deleterious to human, plant, or animal life. Waters designated MUN shall not be in excess of limits specified on page 4-10 and in Title 22 California Code of Regulations (CCR).
Sodium	Shall not exceed 30 mg/l as a result of controllable water quality factors.
Solids (Suspended and settable)	Shall not contain suspended or settable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.
Sulfate	Shall not exceed 20 mg/l as a result of controllable water quality factors.
Sulfide	Dissolved sulfide content of inland surface waters shall not be increased as a result of controllable water quality factors.
Taste and odor	Shall not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses.
Temperature	Shall not be increased by more than 5 degrees Fahrenheit as a result of controllable water quality factors.
Toxic substances	All waters shall be maintained free of substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Turbidity	All inland surface waters of the region shall be free of changes in turbidity that adversely affect beneficial uses.

mg/l: milligrams per liter

µg/l: micrograms per liter

Source: *Water Quality Control Plan, Santa Ana River Basin (8)*, Santa Ana Regional Water Quality Control Board, 1995.

2.6.2 Groundwater Quality Objectives

The groundwater quality objectives for Santa Ana Region groundwater and those specific to the Bunker Hill II Groundwater Basin as designated in the Basin Plan are provided in Table E. These objectives are for constituents that are limiting factors of the designated beneficial uses of groundwater in the Basin (e.g., municipal, agricultural, and industrial uses).

Table E: Groundwater Quality Objectives for the Bunker Hill II Groundwater Basin

Constituent	Concentration	Area
Arsenic	Shall not exceed 0.05 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Barium	Shall not exceed 1.0 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Boron	Shall not exceed 0.75 mg/l as a result of controllable water quality factors.	Santa Ana Region
Chloride	Shall not exceed 20 mg/l as a result of controllable water quality factors.	Bunker Hill II Basin
Coliform (total)	Shall not exceed 2.2 organisms/100 ml median over any seven-day period as a result of controllable water quality factors.	MUN beneficial use designation
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses.	Santa Ana Region
Cyanide	Shall not exceed 0.2 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Dissolved solids (Total)	Shall not exceed 290 mg/l as a result of controllable water quality factors.	Bunker Hill II Basin
Fluoride	Shall not exceed 1.0 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Hardness (as Calcium Carbonate)	Shall not exceed 190 mg/l as a result of controllable water quality factors.	Bunker Hill II Basin
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that cause a nuisance or adversely affect beneficial uses.	Santa Ana Region
Metals		
Cadmium	Shall not exceed 0.01 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Chromium	Shall not exceed 0.05 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Cobalt	Shall not exceed 0.2 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Copper	Shall not exceed 1.0 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Iron	Shall not exceed 0.3 mg/l as a result of controllable water quality factors.	MUN beneficial use designation

Table E: Groundwater Quality Objectives for the Bunker Hill II Groundwater Basin

Constituent	Concentration	Area
Lead	Shall not exceed 0.05 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Manganese	Shall not exceed 0.05 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Mercury	Shall not exceed 0.002 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Selenium	Shall not exceed 0.01 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Silver	Shall not exceed 0.05 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Methylene blue-activated substances	Shall not exceed 0.05 mg/l as a result of controllable water quality factors.	MUN beneficial use designation
Nitrate as Nitrogen	Shall not exceed 5 mg/l as a result of controllable water quality factors.	Bunker Hill II Basin
pH	The pH of groundwater shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.	Santa Ana Region
Radioactivity	Groundwater designated MUN shall not be in excess of limits specified on page 4-14 and in Title 22 California Code of Regulations, Chapter 15, Section 64443, Table 4.	MUN beneficial use designation
Sodium	Shall not exceed 30 mg/l as a result of controllable water quality factors.	Bunker Hill II Basin
Sulfate	Shall not exceed 62 mg/l as a result of controllable water quality factors.	Bunker Hill II Basin
Taste and odor	Groundwater shall not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses.	Santa Ana Region
Toxic substances	All waters shall be maintained free of substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life.	Santa Ana Region

mg/l: milligrams per liter

Source: *Water Quality Control Plan, Santa Ana River Basin (8)*, Santa Ana Regional Water Quality Control Board, 1995.

2.7 EXISTING WATER QUALITY

2.7.1 Surface Water Quality

The United States Geological Survey (USGS) monitors water resources throughout the U.S. Most of the data from individual sites distributed in the National Water Information System are related to stream flow; however, some water quality data are available for a few select sites. In addition, USGS launched the National Water Quality Assessment (NAWQA) Program in 1991 and has been collecting water quality information on watersheds throughout the country. Constituents tested reflect limiting parameters for aquatic life but do not necessarily include typical urban runoff pollutants. The sampling location nearest the project site is City Creek (USGS Site No. 11055800). However, this sampling location only measures the depth and flow of City Creek. The nearest location to the project

site that does sample existing water quality is the Santa Ana River near Mentone (USGS No. 11051502).¹ Surface water quality data for this sampling location is summarized in Table F.

Table F: Water Quality Data for USGS Sampling Location No. 11051502

Constituent	Average concentration
Temperature	48.2°F
Dissolved Oxygen	7.5 mg/l
Total Phosphorus	10.5 mg/l
pH	8.0 mg/l
Ammonia	0.04 mg/l
Nitrate-Nitrite	0.58 mg/l
Chloride	2.44 mg/l
Sulfate	4.0 mg/l
Suspended Sediment	114 mg/l

Source: U.S. Geological Survey, 2007.

In general, the quality of surface water and groundwater in the Santa Ana Basin becomes progressively poorer as water moves along hydraulic flow-paths. The highest quality water is typically associated with tributaries flowing from surrounding mountains and groundwater recharged by these streams. Water quality is altered by a number of factors including consumptive use, importation of water high in dissolved solids, runoff from urban and agricultural areas, and the recycling of water within the basin.²

2.7.2 Groundwater Quality

Groundwater in Bunker Hill Subbasin is predominately calcium-bicarbonate with a Total Dissolved Solid (TDS) range of 150 mg/l to 550 mg/l. According the California Department of Health Services, the TDS concentration from public supply water wells indicate an average TDS content of 324 mg/l and a range of 155 to 1,140 mg/l.³ The most serious problems in the Bunker Hill Subbasin continue to be several trichloroethylene (TCE), tetrachloroethylene (PCE), and dibromochloropropane (DBCP) contamination plumes, including the Redlands, Norton Air Force Base, Newark, Muscoy, and Santa Fe Plume.

¹ Water Quality Samples for the Nation, USGS 11051502 SAR Supp Gage NR MENTONE,CA, www.usgs.gov, website accessed February 28, 2007.

² National Water-Quality Assessment Program, Santa Ana Basin, http://ca.water.usgs.gov/sana_nawqa/index.html, website accessed February 27, 2007.

³ Bulletin 118: Upper Santa Ana Valley Groundwater Basin, Bunker Hill Subbasin, California Department of Water Resources, last update February 27, 2004.

3.0 ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

Section 3.0 discusses the potential environmental effects with implementation of the project, as well as the procedures and practices that will be applied to reduce those effects.

3.2 CALTRANS STANDARD PROCEDURES AND PRACTICES

This report is consistent with the Caltrans storm water management approach outlined in the (SWMP). The impact analysis included completing an analysis of existing water quality utilizing the Caltrans Water Quality Tool.

The project currently comprises a bridge structure and paved street, with curbs, gutters, storm drain inlets and storm drain pipelines that eventually lead into City Creek and Bledsoe Creek. The proposed project is not anticipated to substantially increase the impervious surfaces area at the project site. Rainwater would be collected and conveyed to the existing storm drain system.

3.2.1 Project Planning and Design

This report identifies key water quality concerns and potential project impacts. As the project progresses into more refined design and engineering, an increased level of detail for BMPs and specific locations will be addressed.

Project planning personnel should assess the need for and opportunities to incorporate temporary and permanent BMPs during the initial planning phases of the project. Pollution prevention BMPs should also be considered as this project progresses. Construction BMPs must meet BCT/BAT requirements for construction projects and be consistent with the practices required under the Statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity and the San Bernardino County MS4 NPDES permit.

The BMPs that must be considered during the planning and design phase include Design Pollution Prevention BMPs, Treatment, and Construction Site BMPs. Design Pollution Prevention and Construction Site BMPs must be considered for every project. These BMPs are required to be incorporated, as appropriate, into the design of new facilities and reconstruction or expansion of existing facilities.

Pollutants of concern for roadway projects and applicable Caltrans-approved treatment BMPs, that physically remove pollutants, are summarized in Table G. Caltrans lists several construction site BMPs, which are temporary pollution prevention activities to be utilized during the construction phase. These BMPs are selected for their applicability to a specific project and are incorporated into the SWPPP.

Table G: Pollutants of Concern and Applicable Treatment BMPs

	Biofiltration Systems	Infiltration Basin	Detention Devices	Dry Weather Flow Diversions¹	Gross Solids Removal Devices	Multi-Chambered Treatment Train	Media Filters	Wet Basins	Traction Sand Traps
Total suspended solids	X	X	X	X		X	X	X	X
Nutrients		X		X				X ²	
Pesticides		X		X					
Particulate metals	X	X	X	X		X	X	X	
Dissolved metals		X		X			X		
Pathogens		X		X				X	
Litter	X	X	X	X	X	X	X	X	
Biochemical oxygen demand		X		X				X	
Total dissolved solids		X		X					

1 Dry weather flow diversions address non-storm water flows only.

2 Reductions observed for dry weather flow only.

Source: Storm Water Quality Handbooks, Project Planning and Design Guide, September 2002.

3.2.2 Project Construction

BMPs that would be considered during the construction of this project are temporary control practices that are consistent with the BMPs and control practices required in the Statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity and the Caltrans SWMP. Temporary control practices include soil stabilization, sediment control, erosion control, tracking control, non-storm water control, waste management, and materials pollution control.

Construction scheduling would consider the amount and duration of soil exposed to erosion by wind, rainfall, runoff, and vehicle tracking and seek to minimize disturbed soil area during the rainy season. A schedule would be prepared that outlines the sequencing of construction activities with the installation of erosion and sediment control BMPs. The diversion of storm water runoff and conveyance of concentrated flows must be considered in determining the appropriateness of the BMPs chosen. BMPs to divert or manage concentrated flows in a non-erodible fashion may be required on a project-by-project basis to divert off-site drainage through or around the construction site or to properly manage construction site storm water runoff.

3.2.3 Project Operation and Maintenance

As an operating bridge facility, the Boulder Avenue Bridge Replacement Project must consider the incorporation of treatment BMPs to treat storm water runoff from the bridge. Caltrans-approved treatment BMPs include biofiltration (vegetated swales and strips), infiltration basins, detention devices, traction sand traps, media filters, gross solid removal devices, multi-chambered treatment trains, wet basins, and dry weather flow diversion.

3.3 IMPACT ASSESSMENT METHODOLOGY

The purpose of this Water Quality Assessment Report is to analyze the differences between the existing condition and the project build condition, with respect to water quality impacts. The assessment takes the following into consideration:

- Pollutant sources (change in land use);
- Impervious area and relation to amount of runoff (increase or decrease);
- Application of BMPs (number of BMPs, new technologies, effectiveness); and
- Discharges into impaired waters (listed pursuant to Section 303[d] of the CWA).

Currently, the project site is occupied by the existing Boulder Avenue Bridge. The purpose of the project is to replace the existing bridge, to enhance traffic operations and to reduce existing traffic congestion in this area by constructing a new four-lane bridge over City Creek and widening Boulder Avenue 190 feet to the north and 1,430 feet to the south from two (2) lanes to four (4) lanes.

3.4 POTENTIAL IMPACTS TO WATER QUALITY

3.4.1 Short-Term Impacts During Construction

The replacement of Boulder Avenue Bridge would result in construction and demolition activities that have a potential to cause erosion, sedimentation, and the discharge of non-storm water runoff from the project site. Clearing of vegetation and grading could lead to exposed or stockpiled soils susceptible to peak storm water runoff flows. Also, the compaction of soils by heavy construction machinery may reduce the infiltration capacity of soils (exposed during construction) and increase runoff and erosion potential. Demolition activities and the presence of significant amount of raw materials for bridge construction, including concrete, asphalt, and slurry, may lead to storm water runoff contamination. If uncontrolled, these materials could lead to water quality problems including sediment-laden runoff, prohibited non-storm water discharges, and ultimately the degradation of downstream receiving waters.

Within the project limits there currently exists approximately 0.878 hectares (2.16 acres) of impervious surfaces. With implementation of the proposed project, the total amount of impervious surface would be 1.476 hectares (3.64 acres). Construction activities would involve the additional soil disturbance of 0.598 hectares (1.48 acres). The reconstruction of the bridge and widening of Boulder Avenue would require specific BMPs to prevent construction pollutants from entering the channel. Under the Statewide NPDES permit, the project proponent is required to implement BMPs to prevent the degradation of existing water quality. If construction BMPs are properly designed, implemented, and maintained as required by the NPDES permit, then no adverse water quality impacts would occur during construction of the proposed project.

3.4.2 Long-Term Impacts During Operation

Pollutants of concern during operation of a transportation facility typically include sediments, trash, petroleum products, metals, and chemicals. An increase in impervious area increases the volume of runoff during a storm, which can more effectively transport pollutants to receiving waters and may lead to downstream erosion.

Based on preliminary bridge designs, the proposed project would add 0.598 hectares (1.48 acres) of impervious surface to the project area. The project would not involve a change in land use with the exception of converting some vacant areas to roadway. It is anticipated that because the project site would add a minimal amount of impervious surfaces, the effect of the proposed project on the velocity or volume of downstream flow would be negligible, and no substantial hydraulic changes or erosion would occur.

Existing bridge flow conditions consist of water flowing from the existing bridge along the edge of the existing rolled curbs. Flows continue along these existing curbs until reaching an opening in the curbing where flows drain onto adjacent land before proceeding to City Creek and Bledsoe Creek. It is anticipated that runoff from the proposed project would pass through existing features that would filtrate runoff before reaching City and Bledsoe Creek. Because infiltration of runoff would occur, no adverse water quality impacts would occur during the operation of the proposed project.

4.0 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The following mitigation measures were identified as reducing short-term construction and long-term operational water quality impacts associated with the implementation of the proposed project.

- WQ-1** The project proponent shall comply with the provisions of the *Statewide National Pollutant Discharge Elimination System (NPDES) General Construction Activity Permit* (NPDES Permit No. CAS000002) and any subsequent permit or individual permit if required by the Santa Ana Regional Water Quality Control Board (RWQCB) as it relates to construction activities for the project including dewatering. This shall include a Notice of Intent (NOI) to the State Water Resources Control Board prior to the start of construction. Upon completion of work and the stabilization of all disturbed areas. A Notice of Termination shall be submitted to the Santa Ana RWQCB.
- WQ-2** The project proponent shall submit a complete notification package and associated fees to the California Department of Fish and Game (CDFG) regional office that serves the County where the streambed alteration activity will take place. This shall include coordination with the CDFG with respect to the drafting and acceptance of a Section 1602 Streambed Alteration Agreement from the CDFG for construction activities that are anticipated to occur within the City Creek and Bledsoe Creek channels.
- WQ-3** The project proponent shall obtain a Section 404 permit from the U.S. Army Corps of Engineers (Corps) for activities that would discharge materials into a water of the U.S. This shall include coordination with the Corps with respect to the submittal of the permit application and supplemental information required for permit processing.
- WQ-4** The project proponent shall obtain a 401 Certification from the Santa Ana Regional Water Quality Control Board for activities that would discharge materials into navigable waters. This shall include coordination with the Santa Ana RWQCB with respect to the submittal of the permit application and supplemental information required for certification.

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APPENDIX A
CONCEPTUAL DESIGN

APPENDIX B
FEMA FLOOD MAPS