WATER QUALITY REPORT

West Valley Connector Project

San Bernardino County Transportation Authority

OmniTrans
Connecting Our Community.

April 2018
(Updated January 2020)

Revision Log

Date	Description
April 2018	Original report prepared
January 2020	Project schedule update Mitigation measures update

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LIST OF ACRONYMS

AB	Assembly Bill
ADA	Americans with Disabilities Act
AGR	Agricultural Supply
APN	Assessor's Parcel Number
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BRT	Bus Rapid Transit
CBWM	Chino Basin Watermaster
CDFW	California Division of Fish and Wildlife
CEQA	California Environmental Quality Act
CGP	Construction General Permit
CNG	Compressed Natural Gas
COD	chemical oxygen demand
CWA	Clean Water Act
DCA	dichloroethane
DCE	dichloroethene
°F	degrees Fahrenheit
DSA	disturbed soil area
EA	Environmental Assessment
EIR	Environmental Impact Report
EVVMF	East Valley Vehicle Maintenance Facility
FTA	Federal Transit Administration
HA	Hydrologic Area
HCOC	Hydrologic Conditions of Concern
HR	Hydrologic Region
HSA	hydrologic subarea
HSG	Hydrologic Soils Group
HU	Hydrologic Unit
IEUA	Inland Empire Utilities Agency
IGP	Industrial General Permit
IND	Industrial Service Supply
LID	Low-impact development
MBAS	Methylene Blue-Activated Substances
MCL	Maximum Contaminant Level
MEP	Maximum Extent Practicable
µg/L	micrograms per liter
mg/L	milligrams per liter
mL	milliliter
MOU	Memorandum of Understanding
mph	miles per hour
MPN	Most Probable Number
MS4	Municipal Separate Storm Sewer System
msl	above mean sea level
MUN	Municipal and Domestic Supply

N	nitrogen
NAICS	North American Industrial Classification System
NEPA	National Environmental Policy Act
NIA	natural infiltration area
NNISA	net new impervious surface area
NO_2	nitrogen oxide
NO_3	nitrate
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity units
O&M	operations and maintenance
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
pH	alkalinity
PROC	Industrial Process Supply
REC	Recreation
ROW	right of way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SBCTA	San Bernardino County Transportation Authority
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
SIC	Standard Industrial Classification
SR	State Route
State	State of California
SWAMP	Surface Water Ambient Monitoring Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCE	trichloroethene
TCP	tricholopropane
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSP	Transit Signal Priority
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
U.S.	United States
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USGS	United States Geological Survey
WDR	Waste Discharge Requirement
WQO	Water Quality Objective
WQR	Water Quality Report
WVC	West Valley Connector
WVVMF	West Valley Vehicle Maintenance Facility

EXECUTIVE SUMMARY

The objectives of the Water Quality Report (WQR) are to describe existing water resources, determine if potential project impacts of the proposed West Valley Connector (WVC) Project on water resources would be adverse, based on preliminary project information, and identify best management practices (BMPs) and project design features to protect water quality and downstream receiving waters. This WQR discusses how the project would increase the amount of impervious surfaces and could increase runoff volumes. It also discusses how the project could generate additional water pollutants, which could be carried by surface flows into local drainages.

The project is subject to State of California (State) and federal environmental review requirements because it involves the use of funds from the Federal Transit Administration (FTA). Project documents have been prepared in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). San Bernardino County Transportation Authority (SBCTA) is the CEQA lead agency and FTA is the NEPA lead agency. As the lead agency for CEQA, SBCTA is performing technical studies and preliminary engineering and design. The proposed project is a 35-mile-long bus rapid transit (BRT) corridor project located primarily along Holt Boulevard/Avenue and Foothill Boulevard that would connect the cities of Pomona, Montclair, Ontario, Rancho Cucamonga, and Fontana in the counties of Los Angeles and San Bernardino, California.

The proposed project would include a new operations and maintenance (O&M) facility near the project alignment to support the expanded bus fleet required for the project. This new Level I facility would provide facilities for drivers and management personnel directly associated with the BRT operations, parking for buses and O&M facility workers, and facilities to wash, clean, fuel, and perform minor day-to-day maintenance of the buses. Heavy maintenance and repairs would be provided by the existing Level III East Valley Vehicle Maintenance Facility (EVVMF).

The proposed project would include use of the existing EVVMF in San Bernardino for heavy maintenance and repairs. New and longer service bays would be required to service the bus fleet. Modifications to the maintenance building, the bus wash building, fueling area, and the bus parking area would be required to accommodate the fleet. In the longer term, as additional BRT corridors are implemented and the articulated bus fleet grows, SBCTA could accommodate those maintenance requirements at other new facilities.

The project also incorporates existing parking facilities and proposes development of new parking facilities. The parking facilities would accommodate BRT patrons. Parking facility maintenance agreements would be established with the appropriate city based on the location of the parking facility.

Project alternatives that have been considered and evaluated in this report include:

- No Build Alternative
- Alternative A – Rapid line with no dedicated bus-only lanes
- Alternative B – Full BRT with 3.5 miles of dedicated bus-only lanes in Ontario (includes two mixed-flow lanes and one transit lane in each direction)

For both of the build alternatives, the general setting is the same. Under existing conditions, the watersheds, groundwater, drainages, and direct and indirect receiving waters are consistent among the No Build Alternative and the two build alternatives. Under the proposed project, both of the build alternatives have the same general setting because the proposed project is being developed within an existing facility with minor changes. The project is located within the Santa Ana River hydrologic unit and in the Chino Split hydrologic subarea (HSA) (Santa Ana Regional Water Quality Control Board [RWQCB], 2016). The Chino Split HSA covers approximately 190,515 acres. Offsite receiving water bodies that ultimately drain to the Pacific Ocean include:

- San Antonio Creek
- West Cucamonga Creek
- Cucamonga Creek Reach 1
- Day Creek
- East Etiwanda Creek
- San Sevaine Channel
- Chino Creek Reach 2 (Beginning of concrete channel to confluence with San Antonio Creek)
- Chino Creek Reach 1B (Mill Creek confluence to start of concrete lined channel)
- Chino Creek Reach 1A (Santa Ana River Reach 5 confluence to just downstream of confluence with Mill Creek)
- Santa Ana River Reach 3
- Santa Ana River Reach 2
- Santa Ana River Reach 1
- Huntington Beach State Park

The offsite water bodies associated with the project have been designated as impaired on the Clean Water Act 303(d) list (Santa Ana RWQCB, 2017) and have total maximum daily loads established for several pollutants. The potential water pollutants of concern for this project, however, would only be those associated with runoff from paved surfaces. Therefore, the pollutants of concern that were considered when developing the post-construction treatment strategy include copper, lead, zinc and nutrients.

The project overlies the Raymond Groundwater Basin in Los Angeles County and the Chino Basin in San Bernardino County. Groundwater quality in the Raymond Basin is characterized as typically calcium bicarbonate. The average total dissolved solids (TDS) content in the Pasadena portion of the basin is about 400 milligrams per liter (mg/L), with a high concentration of 600 mg/L. The conductivity of groundwater ranges from 436 to 895 micro mhos per centimeter. Data for 70 public supply wells indicate an average TDS content of 346 mg/L with a range from 138 to 780 mg/L. Water quality impairments in the Raymond Basin include fluoride content, which occasionally exceeds recommended levels of 1.6 mg/L near the San Gabriel Mountain front. High nitrate concentrations are found in water from some wells near Pasadena and volatile organic compounds are detected in wells near Arroyo Seco. Radiation is occasionally detected near the San Gabriel Mountains, and a Superfund site exists near the Jet Propulsion Laboratories because of perchlorate contamination (Department of Water Resources, 2004).

The chemicals of potential concern in the Chino Basin include:

- Constituents associated with salt and nutrient management planning, which are primarily TDS and nitrate.
- Other constituents where a primary maximum contaminant level (MCL) was exceeded in twenty or more wells from July 2009 to June 2014, and are not primarily exclusive to one particular point source (i.e., the Stringfellow National Priorities List site); these include nitrate, perchlorate, total chromium, hexavalent chromium, arsenic, trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene (cis-1,2DCE), 1,1-dichloroethene (1,1-DCE), and 1,1-dichloroethane (1,1-DCA).
- Constituents for which the California Department of Drinking Water is developing an MCL that may impact future beneficial uses of groundwater; this includes 1,2,3-trichloropropane (1,2,3-TCP) (Wildermuth Environmental, Inc., 2015).

The affected environment is mostly built out and has been substantially altered by human activity; it no longer functions as a natural hydrologic system. The total disturbed soil area (DSA) for the construction of the Alternative A and B alignments and stations are estimated at 3.10 acres and 60.64 acres, respectively. Alternative B is the only alternative that would increase the amount of impervious surfaces. The net increase in amount of impervious surfaces associated with the Alternative B alignment and stations would be 1.81 acres[1].

In addition, an O&M facility to be built near the project alignment to support expanded bus operations would create an additional DSA either 9.60, 4.77, and 9.40 acres, depending on

[1] Note that the difference between the DSA and the net increase in impervious surface area consists of impervious areas that are disturbed during construction and then re-covered or repaved. Thus, Alternative A would remove and replace 3.10 acres of impervious surfaces and Alternative B would remove and replace 58.83 acres of impervious surfaces.

which potential site is selected. The increase in amount of impervious surfaces for the O&M facility would be 0.00, 0.47, or 8.56 acres, depending on the site selected.

In areas where project-related improvements are required, impervious surfaces are already common because of past land development. In most locations, the project would result in a small absolute increase in amount of impervious surface (Table 5-1). Stormwater runoff from the project during construction and operation could contribute water pollutants of concern to the stormwater conveyance system. During construction and operation, SBCTA would ensure that the permit requirements and project design features are implemented to minimize or avoid water quality impacts. A combination of BMPs and project design features incorporated in response to regulatory requirements would minimize water quality impacts, so no mitigation measures would be necessary. These permit requirements and project design features are part of the project and are discussed in greater detail below.

The effects on water quality from construction of the proposed project would be minimized by following the guidelines and regulations established by the Construction General Permit for Discharges Associated with Construction Activities, Order No. 2009-0009-DWQ, amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ (Construction General Permit [CGP]). A Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented. The SWPPP would identify BMPs to minimize erosion and sediment, and ensure the proper handling and storage of materials that could affect water quality. During construction, materials would be stored properly to avoid affecting the receiving waters. The SWPPP would include a Construction Site Monitoring Program, based on the project's risk level, to ensure that the implemented BMPs are effective and to prevent any discharge that would result in exceeding any water quality standard.

Dewatering is expected to be limited and, if required, would fully conform to the requirements specified in the National Pollutant Discharge Elimination System (NPDES) permit for discharges to surface water that pose an insignificant *(de minimis)* threat to water quality, from either the Santa Ana Regional Water Quality Control Board (RWQCB) per Order No. R8-2009-0003 (NPDES No. CAG998001) or the Los Angeles RWQCB under Order No. R4-2013-0095 (NPDES No.CAG994004).

To minimize permanent water quality impacts, onsite stormwater management measures, such as Site Design / Low-Impact Development (LID) BMPs and Treatment Control BMPs, would be designed and constructed to capture runoff and provide treatment prior to discharge from pollutant-generating surfaces, including parking lots, bus stations, building roofs, dedicated lanes, and queue jump lanes. The municipal separate storm sewer (MS4) NPDES permit for Los Angeles County, R4-2012-0175, CAS004001, and the San Bernardino County MS4 Permit, Order No. R8-2010-0036, CAS618036, identify requirements for BMPs to control pollutants, pollutant loads, and runoff volume emanating from project sites. Site Design/LID BMPs are considered project design features, and this

WQR recommends that SBCTA incorporate low impact development (LID) design into the project design. Applicable LID strategies would include biofiltration, bioretention, and development of natural infiltration areas. These project design features would manage runoff to minimize any significant effects on adjacent impervious surfaces or to the stormwater conveyance system, thereby protecting downstream water bodies.

With the implementation of BMPs, project design features, and adherence to water quality regulations, the effects during construction on drainage and stormwater runoff patterns, as well as groundwater quality, would be negligible. The WVC Project would not substantially change the water quality of local channels and creeks. Similarly, effects on surface water quality from operation of the project would be negligible with implementation of project design features and adherence to water quality regulations. Because the WVC Project would be required to comply with NPDES permit regulations during construction and operation and because these permit requirements and associated project design features are considered part of the project, no mitigation measures are proposed.

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1.0 INTRODUCTION

This Water Quality Report (WQR) analyzes the potential water quality impacts of the West Valley Connector (WVC) Project (the WVC Project or the proposed project). The objectives of this analysis are to describe the regulatory setting, affected environment, impacts on water quality that could result from the project, and mitigation measures that would reduce these impacts. This WQR includes a range of topics related to water resources, including surface water hydrology, water quality, best management practices (BMPs), and project design features.

The San Bernardino County Transportation Authority (SBCTA), in cooperation with the cities of Pomona, Montclair, Ontario, Rancho Cucamonga, and Fontana, proposes construction of the WVC Project, a 35-mile-long bus rapid transit (BRT) project that would decrease travel times and improve the existing public transit system within the corridor.

In January 2017, SBCTA entered into a cooperative agreement with Omnitrans designating SBCTA as the lead agency for the proposed WVC Project. SBCTA intends to construct the WVC, which will then be operated by Omnitrans. SBCTA has the authority to allocate Federal Transit Administration (FTA) funds; however, it does not have the ability to receive funds directly from FTA. Omnitrans is the direct FTA grantee for the San Bernardino Valley. As a result, SBCTA and Omnitrans have developed a successful direct recipient/ subrecipient working relationship to deliver projects with FTA funds. The current relationship allows the delivery of FTA-funded projects that meet FTA requirements without duplicating staff, assuring the best use of limited public funds available. Omnitrans and SBCTA executed Memorandum of Understanding (MOU) 15-1001289 in October 2015, setting forth the roles and responsibilities of the recipient/subrecipient relationship.

The project is subject to state and federal environmental review requirements because it involves the use of federal funds from the FTA. An Environmental Impact Report (EIR)/Environmental Assessment (EA) has been prepared for the proposed project in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). SBCTA is the CEQA lead agency, and FTA is the NEPA lead agency. This WQR has been prepared as part of the technical analysis required to support the EIR/EA.

1.1 Project Location and Setting

The proposed project is located primarily along Holt Avenue/ Boulevard and Foothill Boulevard, and would connect the cities of Pomona, Montclair, Ontario, Rancho Cucamonga, and Fontana in the counties of Los Angeles and San Bernardino, California. The project limits extend from Main Street in the City of Pomona on the west side to Sierra Avenue in the City of Fontana on the east side and Church Street in the City of Rancho Cucamonga on the north side to Ontario International Airport on the south side (Figures 1-1 and 1-2). The project limits also include the three possible O&M facility sites in the area generally bounded by South Cucamonga Avenue, South Bon View Avenue, East Belmont Street, and East Francis Street in the City of Ontario. The project area is primarily urban, and land uses include low-, medium-, and medium-high-density residential, commercial, industrial, open space and recreation, transportation, utilities, agriculture, public facilities, airport, educational facilities, and offices.

1.2 Purpose and Need

The purpose of the proposed project is to improve corridor mobility and transit efficiency in the western San Bernardino Valley from the City of Pomona, in Los Angeles County, to the City of Fontana, in San Bernardino County, with an enhanced, state-of-the-art BRT system (i.e., the system that includes off-board fare vending, all-door boarding, transit signal priority [TSP], optimized operating plans, and stations that consist of a branded shelter/canopy, security cameras, benches, lighting, and variable message signs).

The proposed project would address the growing traffic congestion and travel demands of the nearly one million people that would be added to Los Angeles and San Bernardino Counties by 2040 per Southern California Association of Governments (SCAG) 2016 *Regional Transportation Plan* (RTP)/*Sustainable Communities Strategy* (SCS) growth forecast. Improved rapid transit along the project corridor would help Omnitrans/SBCTA achieve its long-range goals to cost effectively enhance lifeline mobility and accessibility, improve transit operations, increase ridership, support economic growth and redevelopment, conserve nonrenewable resources, and improve corridor safety.

Recognizing the importance of the WVC transit corridor, SBCTA is proposing a project that is designed to achieve the following objectives:

- Improve transit service by better accommodating high existing bus ridership.
- Improve ridership by providing a viable and competitive transit alternative to the automobile.
- Improve efficiency of transit service delivery while lowering Omnitrans' operating costs per rider.
- Support local and regional planning goals to organize development along transit corridors and around transit stations.

The project purpose and objectives stated above would respond to the following needs:

- Current and future population and employment conditions establish a need for higher-quality transit service.
- Current and future transportation conditions establish a need for an improved transit system.
- Transit-related opportunities exist in the project area.

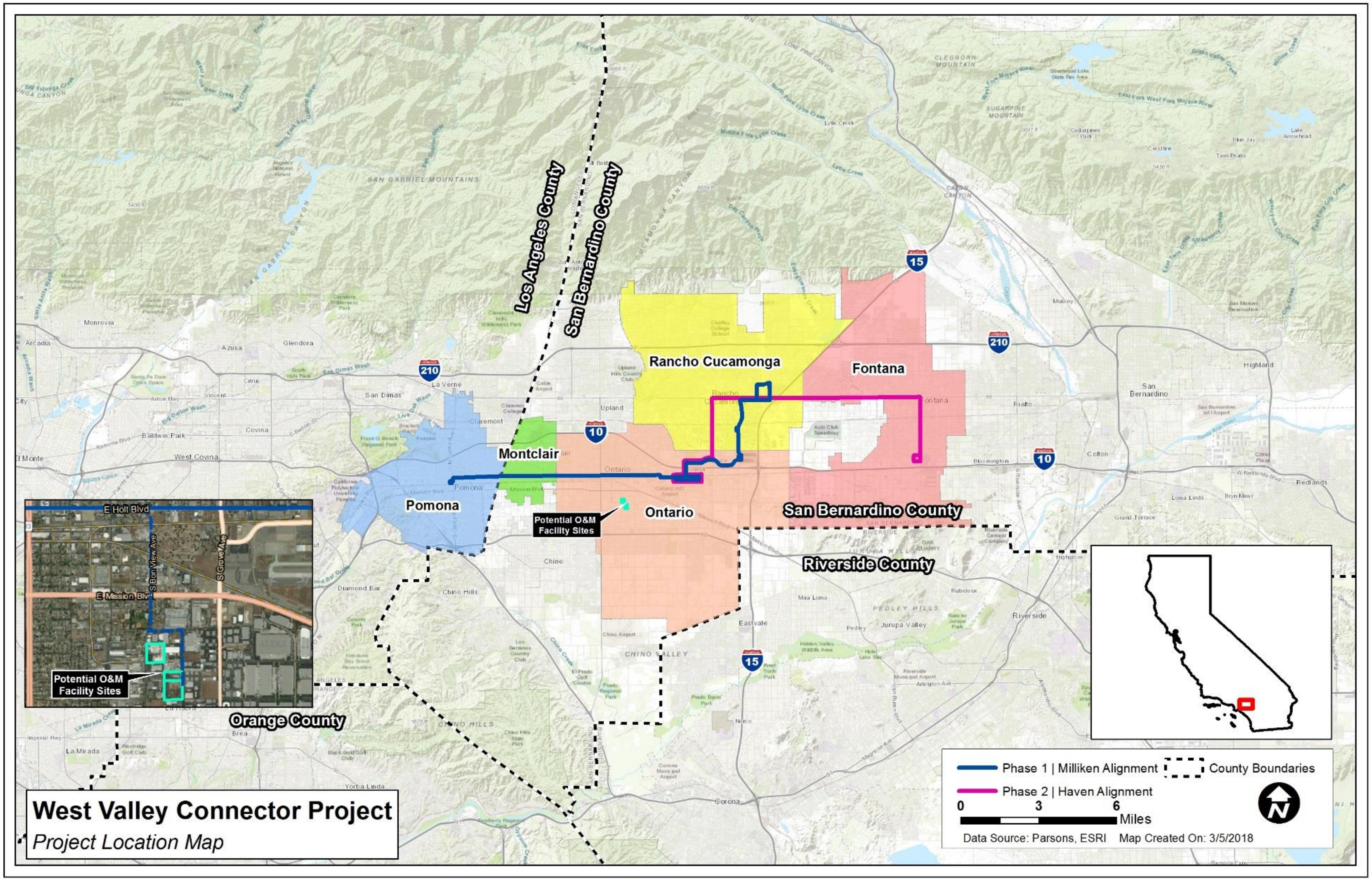

Figure 1-1: Project Location Map

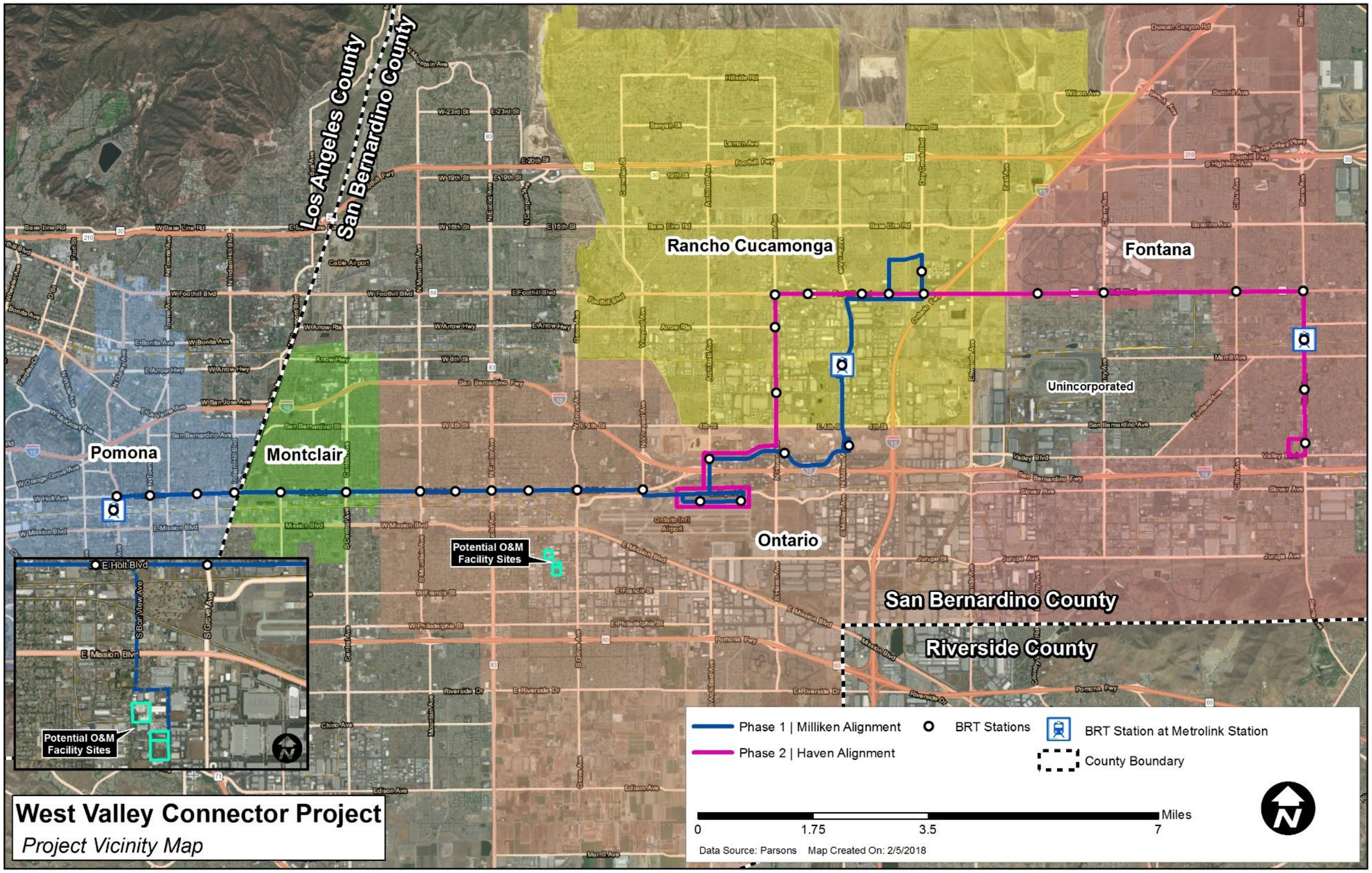

Figure 1-2: Project Vicinity Map

2.0 PROJECT DESCRIPTION

2.1 Proposed Project

The West Valley Connector (WVC) Project is a 35-mile-long bur rapid transit (BRT) corridor project located primarily along Holt Avenue/ Boulevard and Foothill Boulevard that would connect the cities of Pomona, Montclair, Ontario, Rancho Cucamonga, and Fontana in the counties of Los Angeles and San Bernardino, California. The project proposes limited stops, providing speed and quality improvements to the public transit system within the corridor. The project includes BRT stations at up to 33 locations/major intersections and associated improvements, premium transit service, transit system priority (TSP) and queue jump lanes, dedicated lanes, and integration with other bus routes.

The project alignment consists of two phases. Phase I of the project would construct the “Milliken Alignment,” from Pomona Regional Transit Center (downtown Pomona Metrolink Station) to Victoria Gardens in Rancho Cucamonga. Phase II of the project would construct the “Haven Alignment,” from Ontario International Airport to Kaiser Permanente Medical Center in Fontana. The Phase I/Milliken Alignment would begin construction in 2020 and is proposed to have 10-minute peak and 15-minute off-peak headways. Phase II is intended to be constructed immediately following completion of Phase I, depending on the availability of funding.

Phase II of the project would construct the Haven Alignment, from Ontario International Airport to Kaiser Permanente Medical Center in Fontana. In Ontario, the alignment makes a loop through Terminal Way at Ontario International Airport. From the airport, it heads north on Archibald Avenue to Inland Empire Boulevard and turns right to go east on Inland Empire Boulevard.

From Inland Empire Boulevard, the alignment turns left to go north up Haven Avenue into Rancho Cucamonga, then turns right to go east onto Foothill Boulevard and into Fontana.

In Fontana, the alignment continues east on Foothill Boulevard until turning south onto Sierra Avenue. The alignment follows Sierra Avenue, including a stop at the Fontana Metrolink Station, and then continues until turning west onto Marygold Avenue, where the bus line would begin a turn-around movement by heading south onto Juniper Avenue, east onto Valley Boulevard, and north back onto Sierra Avenue to Kaiser Permanente Medical Center before heading northward for the return trip.

2.1.1 Phase I/Milliken Alignment

Phase I of the project would construct the Milliken Alignment from the western boundary limit in Pomona to Victoria Gardens in Rancho Cucamonga. In Pomona, the alignment starts from the Pomona Regional Transit Center station, travels along Holt Avenue and into Montclair.

In Montclair, the alignment runs on Holt Boulevard between Mills Avenue and Benson Avenue and into Ontario.

In Ontario, the alignment continues on Holt Boulevard, starting from Benson Avenue, and then continues to Vineyard Avenue and into Ontario International Airport (loop through Terminal Way). From the airport, it heads north on Archibald Avenue to Inland Empire Boulevard and turns right to go east on Inland Empire Boulevard.

On Inland Empire Boulevard, the alignment goes straight into Ontario Mills (loop through Mills Circle) and then heads north on Milliken Avenue into Rancho Cucamonga.

In Rancho Cucamonga, the alignment makes a loop into the Rancho Cucamonga Metrolink Station off Milliken Avenue and then continues up Milliken Avenue and turns east onto Foothill Boulevard.

The alignment continues east on Foothill Boulevard, turns north onto Day Creek Boulevard, and then terminates with a layover at Victoria Gardens at Main Street. From Victoria Gardens, the bus line begins a return route by continuing north on Day Creek Boulevard, turns west onto Church Street, turns south onto Rochester Avenue, and then turns west back onto Foothill Boulevard.

2.1.2 Phase II/Haven Alignment

Phase II of the project would construct the Haven Alignment, from Ontario International Airport to Kaiser Permanente Medical Center in Fontana. In Ontario, the alignment makes a loop through Terminal Way at Ontario International Airport. From the airport, it heads north on Archibald Avenue to Inland Empire Boulevard and turns right to go east on Inland Empire Boulevard.

From Inland Empire Boulevard, the alignment turns left to go north up Haven Avenue into Rancho Cucamonga, then turns right to go east onto Foothill Boulevard and into Fontana.

In Fontana, the alignment continues east on Foothill Boulevard until turning south onto Sierra Avenue. The alignment follows Sierra Avenue, including a stop at the Fontana Metrolink Station, and then continues until turning west onto Marygold Avenue, where the bus line would begin a turn-around movement by heading south onto Juniper Avenue, east onto Valley Boulevard, and north back onto Sierra Avenue to Kaiser Permanente Medical Center before heading northward for the return trip.

2.2 Project Alternatives

Many alternatives were considered during the project development phase of the project. A No Build Alternative and two build alternatives (Alternatives A and B) are being analyzed in the Environmental Impact Report (EIR)/Environmental Assessment (EA).

2.2.1 No Build Alternative

The No Build Alternative proposes no improvements to the existing local bus services. Under the No Build Alternative, the existing local bus service on Routes 61 and 66 would maintain current service of 15-minute headways (total of four buses per hour in each direction).

2.2.2 Build Alternatives

Figure 2-1 presents the map of both build alternatives. All design features of both build alternatives are the same, as described in more details in Section 2.3, except for the following:

Alternative A – Full BRT with no Dedicated Bus-only Lanes

Alternative A would include the 35-mile-long BRT corridor, which is comprised of the Phase I/Milliken Alignment, Phase II/ Haven Alignment, and 60 side-running stations at up to 33 locations/major intersections. The BRT buses would operate entirely in the mixed-flow lanes. The right-of-way (ROW) limits and travel lane width vary in other segments of the corridor. Implementation of Build Alternative A would not require permanent or temporary ROW acquisition.

Alternative B – Full BRT with 3.5 miles of Dedicated Bus-only Lanes in Ontario

Alternative B would include the full 35-mile-long BRT corridor, which is comprised of the Phase I/Milliken Alignment, Phase II/ Haven Alignment, 3.5 miles of dedicated bus-only lanes, and five center-running stations and 50 side-running stations at up to 33 locations/major intersections. The dedicated lanes segment would include two mixed-flow lanes and one transit lane in each direction and five center-running stations. To accommodate the dedicated lanes, roadway widening and additional utilities, such as electrical and fiber-optic lines, would require permanent and temporary ROW acquisition. In addition, some areas of the project corridor would require reconfiguration, relocation, or extension of adjacent driveways, curbs, medians, sidewalks, parking lots, and local bus stops.

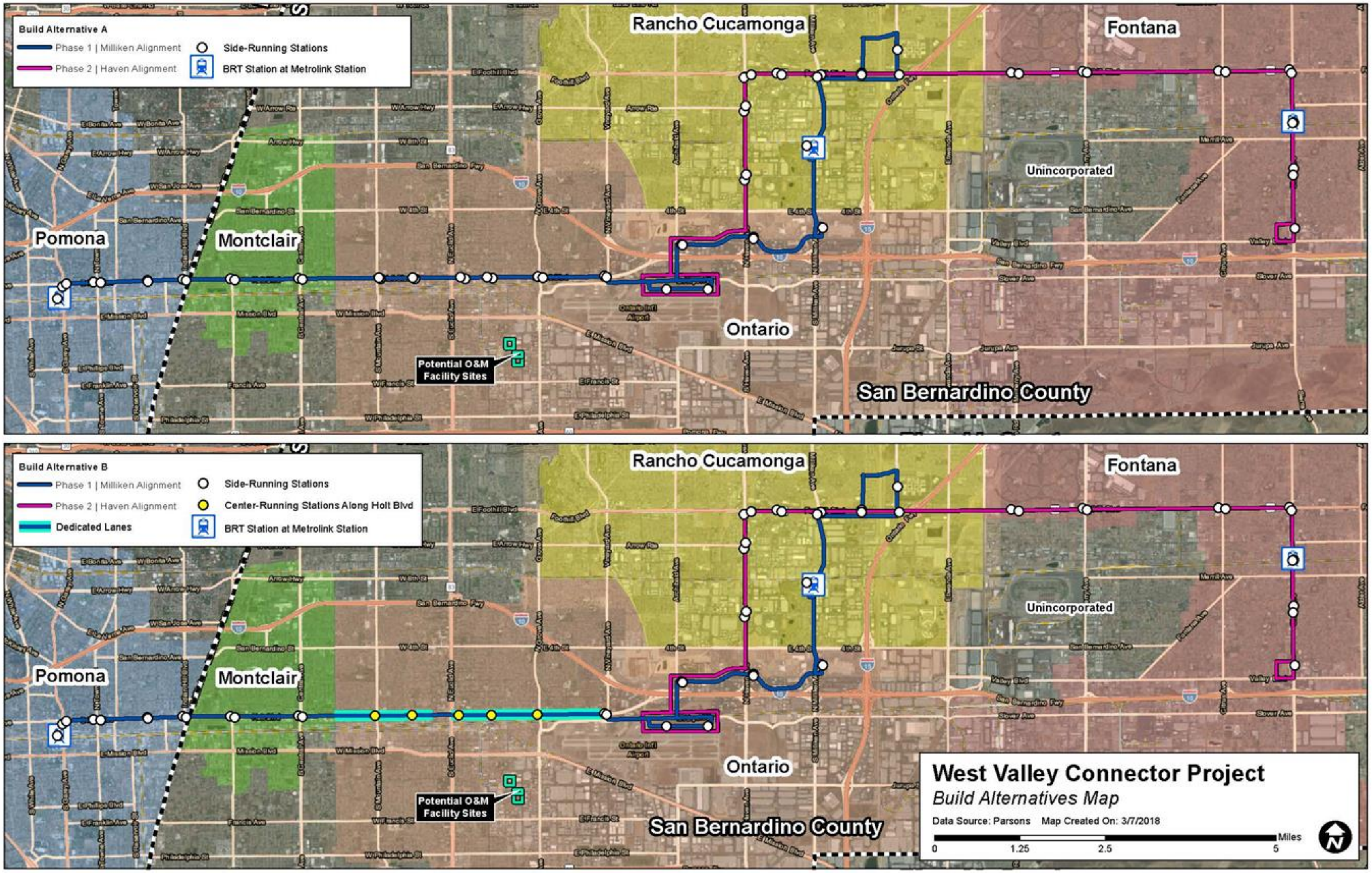

Figure 2-1: Build Alternatives Map

2.3 Design Features of Build Alternatives

2.3.1 Bus Rapid Transit Stations

BRT stations at 33 locations/major intersections and associated improvements are proposed to be located approximately 0.5 to 1 mile apart to facilitate higher operating speeds by reducing dwell time (see Figure 1-2 and Figure 2-1 for station locations). Table 2-1 lists the BRT stations to be constructed as part of Phase I/Milliken Alignment. Note that under Alternative A, all 21 stations would be side-running stations. Under Alternative B, five center platform stations are proposed as follows:

- Holt Boulevard/Mountain Avenue
- Holt Boulevard/San Antonio Avenue
- Holt Boulevard/Euclid Avenue
- Holt Boulevard/Campus Avenue
- Holt Boulevard/Grove Avenue

As part of Phase II/Haven Alignment, an additional 12 side-running stations would be constructed for both build alternatives, as listed in Table 2-2.

Table 2-1: Stations along Phase I/Milliken Alignment

City	Stations
Pomona	• Pomona Regional Transit Center Station • Holt Avenue/Garey Avenue • Holt Avenue/Towne Avenue • Holt Avenue/Clark Avenue • Holt Avenue/Indian Hill Boulevard
Montclair	• Holt Boulevard/Ramona Avenue • Holt Boulevard/Central Avenue
Ontario	• Holt Boulevard/Mountain Avenue* • Holt Boulevard/San Antonio Avenue* • Holt Boulevard/Euclid Avenue* • Holt Boulevard/Campus Avenue* • Holt Boulevard/Grove Avenue* • Holt Boulevard/Vineyard Avenue • Ontario International Airport • Inland Empire Boulevard/Archibald Way • Inland Empire Boulevard/Porsche Way • Ontario Mills
Rancho Cucamonga	• Rancho Cucamonga Metrolink Station • Foothill Boulevard/Milliken Avenue • Foothill Boulevard/Rochester Avenue • Victoria Gardens between North and South Main Street
Note: * denotes the center-running stations to be constructed under Alternative B.	

Source: 30% Preliminary Engineering Design, Parsons 2017.

Table 2-2: Additional Stations to be Constructed as Part of Phase II/Haven Alignment

City	Stations
Rancho Cucamonga	• Haven Avenue/6th Street • Haven Avenue/Arrow Route • Haven Avenue/Foothill Boulevard • Foothill Boulevard/Spruce Avenue • Foothill Boulevard/Day Creek Boulevard
Fontana	• Foothill Boulevard/Mulberry Avenue • Foothill Boulevard/Cherry Avenue • Foothill Boulevard/Citrus Avenue • Foothill Boulevard/Sierra Avenue • Fontana Metrolink Station • Sierra Avenue/Randall Avenue • Sierra Avenue/Kaiser Permanente

Source: 30% Preliminary Engineering Design, Parsons 2017.

Side-Running Stations

Side-running stations would typically be located on the far side of an intersection to facilitate transit priority and to avoid a stopped bus from blocking vehicles turning right from the corridor. Where curb cuts for driveways and other conditions do not provide enough space along the curbside for both the sbX and the local bus on the far side of the intersection, the stops for the local buses would be located on the near side of the intersection.

In the side-running condition, stations may include new or improved shelters with passenger amenities, or only an sbX-branded pylon with signature light. Proposed shelters would be approximately 18 feet long and their width would fit a 10-foot-wide-minimum sidewalk. Passenger amenities at the side platform stations would include benches, bicycle racks, trash receptacles, variable message signs, security cameras, and lighting integrated with the shelter. There would be no fare collection equipment on the sidewalks or shelters when the available ROW is less than 10 feet; the passengers would pay their fare on the bus. Side-running stations would also include various amenities.

For all stations in Rancho Cucamonga, only an sbX-branded pylon with signature light is proposed. Should shelters be implemented in the future, coordination between the City of Rancho Cucamonga and SBCTA would be required for supplemental environmental clearance of the shelters.

Center Platform Stations

Five center platform stations are proposed to be constructed as part of Phase I/Milliken Alignment (in Ontario) under Alternative B. The center platform stations would be in the center of the street ROW on a raised platform with an end-block crossing. Access would be provided by crosswalks at intersections, and Americans with Disabilities Act (ADA)-

compliant ramps would provide access to the station platforms. Center platforms would be placed as close to the intersection as possible while still maintaining left-turn pockets, where required.

In the optimum center platform configuration, the platform would accommodate a canopy with a seating area, passenger amenities, fare equipment, and a ramp to comply with relevant accessibility requirements and provide clearance in front of ticket vending machines. Stations would include amenities that could be assembled and laid out to suit the functionality of the station and fit with the adjacent land uses.

2.3.2 sbX Bus Operations

The proposed project would require 18 buses during the Phase I operation and increase to 27 buses for the Phase I and Phase II operation to serve the designed headways and have sufficient spare vehicles.

Under Alternative A, sbX buses would operate entirely in mixed-flow lanes along the proposed 35 miles of the Phase I and Phase II alignments. For Alternative B, sbX buses would operate in mixed flow lanes similar to Alternative A except where dedicated bus-only lanes (3.5 miles) are proposed along Holt Boulevard, between Benson Avenue and Vine Avenue and between Euclid Avenue and Vineyard Avenue, in Ontario.

Roadway sections where the sbX would operate in mixed-flow lanes would generally be kept as existing conditions, although some modifications, such as relocated curb and gutter, may be necessary near the stations to provide sufficient room for bus stopping and loading. Curbs and gutters would only be reconstructed for the segments where dedicated bus-only lanes are proposed. Vehicular lanes where the sbX buses would operate in dedicated bus-only lanes would feature concrete roadways, painted or striped to visually separate the exclusive lanes from mixed-flow lanes. Transition areas from mixed-flow to exclusive lanes would be provided at each end of an exclusive lane location. Such transitions would be clearly marked to separate bus movements from other vehicular traffic. Reinforced concrete bus pad in the pavement would be placed at all station locations for the sbX buses.

sbX buses would operate from 6:00 a.m. to 8:00 p.m. with peak headways for 4 hours and off-peak headways for 10 hours per day for a total span of service of 14 hours per day, Monday through Friday. From the Pomona Metrolink Transit Center station to Inland Empire Boulevard, the sbX buses would operate on 10-minute peak headways and 15-minute off-peak headways. Additional service hours, including weekend service, could be added if additional operating funds become available in the future.

2.3.3 Operations and Maintenance

Fleet Composition

The proposed project's fleet would be comprised of 60-foot-long articulated compressed natural gas (CNG) propulsion buses. sbX buses would hold approximately 96 passengers at maximum capacity with up to 8 bicycles on board. Today, the average local bus operating speeds are only 12 to 15 miles per hour (mph), and they are getting slower as corridor congestion worsens. In calculating run times, it was assumed that the average dwell time at stations would be 30 seconds (peak service), and average overall speed would be 20 mph. The average speed for sbX buses would be 18 mph.

Maintenance Requirements and Associated Facilities

Omnitrans operates and maintains its existing bus fleets from two major Operations and Maintenance (O&M) facilities: East Valley Vehicle Maintenance Facility (EVVMF), located at 1700 W. 5th Street in the City of San Bernardino and West Valley Vehicle Maintenance Facility (WVVMF), located at 4748 E. Arrow Highway in the City of Montclair. EVVMF is a Level III facility capable of full maintenance of buses and WVVMF is a Level II facility suitable for light maintenance. Neither facility has sufficient capacity to accommodate the additional maintenance and storage requirements of the bus fleet associated with the proposed WVC Project.

The proposed project would include construction of a new O&M facility near the project alignment (Figure 2-1). The purpose of the new O&M facility is to provide routine operations and maintenance support to the existing full-service EVVMF. The new facility would be designed to provide Level I service maintenance, with the capacity to be upgraded to provide Level II service maintenance. Heavy repair functions and administrative functions would remain exclusively with the EVVMF in San Bernardino.

Facility Components

Conceptually, the new O&M facility would be built on an approximate 5-acre site. The Level I facility would include a parking area, bus washing area, fueling area, and a personnel and storage building. As needs arise, the facility could be upgraded to provide Level II service, which would include the addition of a maintenance shop and a larger administrative building. Landscaping and irrigation would be provided to enhance the comfort of employees and the appearance of the facility, and to help screen maintenance facilities and operations from offsite viewpoints within the community. Figure 2-2 shows the conceptual site plan of the Level II facility.

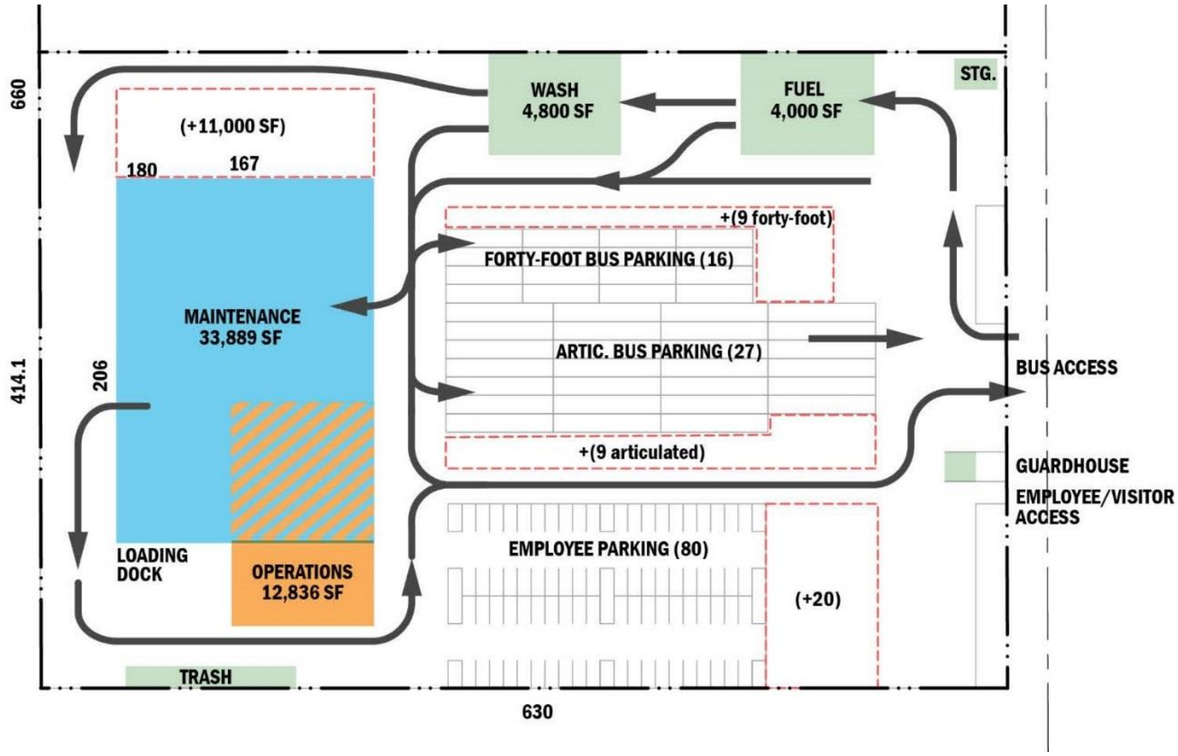

Figure 2-2: O&M Facility Conceptual Site Plan

The O&M facility would include a bus-washing station that would generate wastewater during facility operations. Bus washing activities would not discharge effluent to surface waters or contribute pollutants to storm water runoff from the site. The facility would be designed to contain wash water within the station and to convey it to drains. Used wash water and other effluent from the bus-washing station would be pre-treated on-site, then either conveyed to the sanitary sewer or reclaimed for use at the bus-washing station.

The O&M facility would not increase storm water runoff from the site on which it is located. The storm water runoff from new impervious surfaces would be conveyed to engineered infiltration systems on the site.

Depending on the service level to be performed, approximately 50-100 staff would be using this facility including bus operators and O&M staff.

Potential Sites

Three sites are being considered for the placement of the new O&M facility (Figure 2-3). All three sites are owned by the City of Ontario and are in an industrial zoned area slightly more than a mile from the proposed BRT corridor alignment on Holt Boulevard:

- Site 1: 1516 S. Cucamonga Avenue, Ontario (Assessor's Parcel Number [APN] 1050-131-03-0000 and APN 1050-131-02-0000). The current use of this property is public works storage yard. If selected, the O&M facility would be built on the bottom portion of the parcel, an area of approximately 6.0 acres.

- Site 2: 1440 S. Cucamonga Avenue, Ontario (APN 1050-141-07-0000). The current use of this property is compressed natural gas fueling station. If selected, the O&M facility would use the entire parcel, an area of approximately 4.8 acres.
- Site 3: 1333 S. Bon View Avenue, Ontario (APN 1049-421-01-0000 and APN 1049-421-02-0000). The current use of this property is municipal utility and customer service center. If selected, the O&M facility would be built on the bottom portion of the parcel, an area of approximately 6.6 acres.

Buses coming to and from the new facility could use nearby access roads that directly connect to the BRT corridor, such as South Campus Avenue, South Bon View Avenue, and South Grove Avenue.

The O&M facility would be constructed during the same period as the Phase I/Milliken Alignment and would be open for operation at the same time as the Phase I alignment. Construction duration is estimated at 12 months.

2.4 Implementation Schedule

Implementation of the proposed project is planned over the next 5 years and would entail many activities, including:

- Completion of the environmental compliance phase (March 2020)
- Completion of Preliminary Engineering (March 2020)
- Completion of Final Design (May 2021) and begin construction in early 2022.
- Completion of O&M facility (December 2023)
- Completion of Construction of Phase I/Milliken Alignment and testing (December 2023)
- System operation (begin revenue operation in December 2023)
- Construction of Phase II/Haven Alignment is scheduled to occur after completion of the Phase I/Milliken Alignment pending funding availability

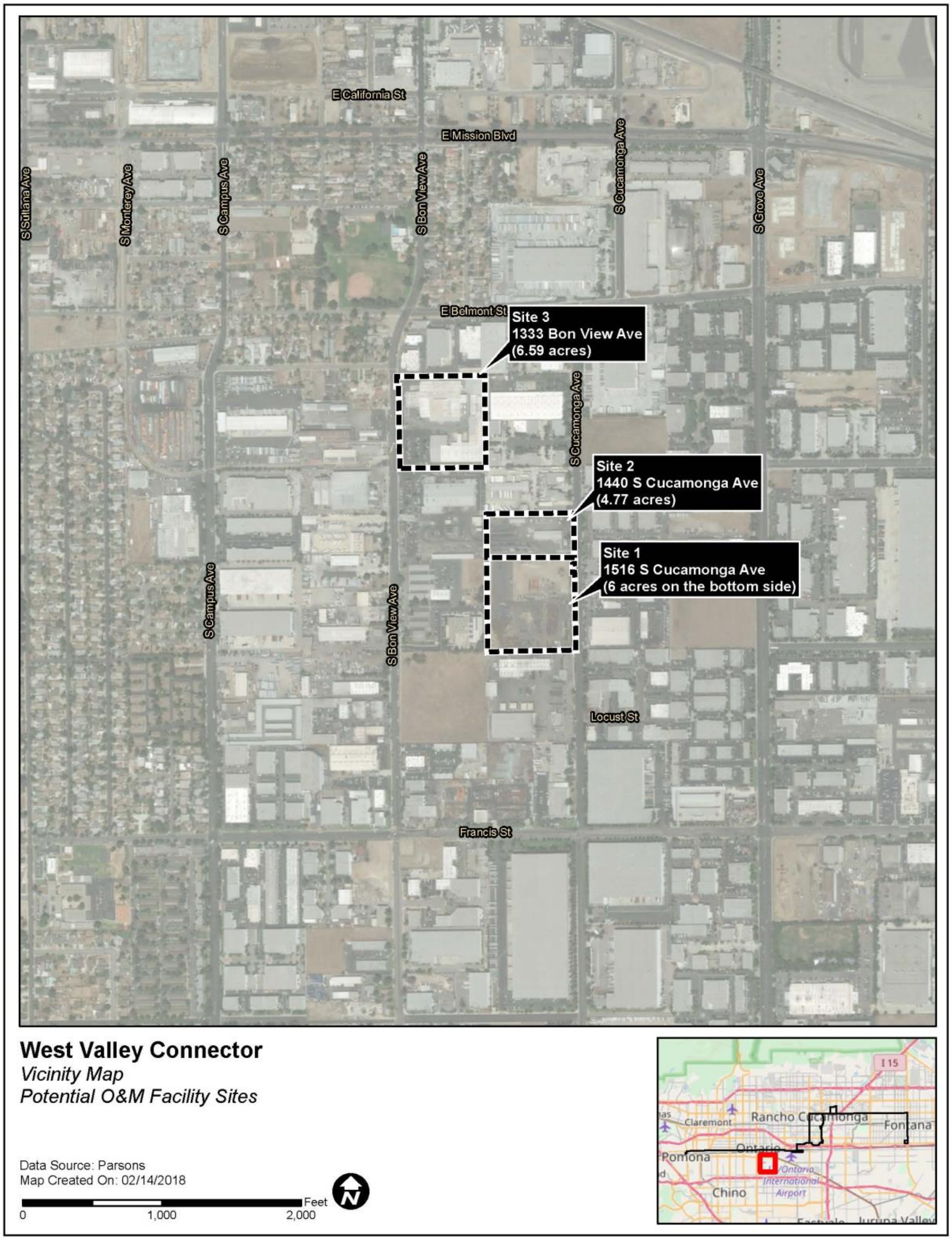

Figure 2-3: Potential Operations and Maintenance Facility Sites

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3.0 REGULATORY FRAMEWORK

3.1 Federal Laws and Requirements

3.1.1 Clean Water Act (33 United States Code [USC] 4321 et seq.)

The Clean Water Act (CWA), is the primary federal law protecting the nation's surface waters, including lakes, rivers, and coastal wetlands. The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Important CWA sections are discussed below.

National Pollutant Discharge Elimination System Program (Section 402)

Section 402 establishes a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the United States (U.S.). It requires a National Pollutant Discharge Elimination System (NPDES) permit for discharges.

Statewide General NPDES Permits

To facilitate compliance with federal regulations, the State Water Resources Control Board (SWRCB) has issued two statewide general NPDES permits for stormwater discharges: one for stormwater from construction sites (NPDES No. CAS000002, NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities [Order No. 2009-0009-DWQ], adopted on September 2, 2009 and amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ, Construction General Permit [CGP]) and the other for stormwater from industrial sites (NPDES No. CAS000001, General Industrial Activity Storm Water Permit [IGP]).

Construction General Permit

Facilities discharging stormwater from construction projects with a disturbed soil area (DSA) of 1 acre or more are required to be covered by the CGP by completing and filing a Notice of Intent (NOI) with the SWRCB (SWRCB, 2016a).

General Industrial Activity Storm Water Permit

The IGP, Order No. 2014-0057-DWQ, was reissued on April 1, 2014, and became effective on July 1, 2015 (SWRCB, 2014). Facilities discharging stormwater from industrial activities are required to obtain individual NPDES permits or to be covered by the statewide general permit by completing and filing an NOI with the SWRCB. The IGP requires a broad range of industrial facilities to be permitted. These facilities include manufacturing facilities, mining operations, disposal sites, recycling yards, and transportation facilities.

Category 8, Attachment A, of the IGP identifies the transportation facilities that fall under Standard Industrial Classification[2] (SIC) 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171, as those which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication) or other operations identified in the IGP that are associated with industrial activity would require coverage.

According to the U.S. Department of Labor[3] industry group 411 includes establishments primarily engaged in furnishing local and suburban passenger transportation, such as those providing passenger transportation within a single municipality, contiguous municipalities, or a municipality and its suburban areas, by bus, rail, or subway, either separately or in combination, and establishments engaged in furnishing transportation to local scenic features. Also included are establishments primarily engaged in furnishing passenger transportation by bus or rail, or between airports or rail terminals, over regular routes, and those providing bus and rail commuter services. Therefore, because the proposed project falls under SIC 41 and an existing operations and maintenance facility would be involved in vehicle maintenance and equipment cleaning operations, the project would be required to submit a revised Site Map and update *the Industrial Storm Water Pollution Prevention Plan* (SWPPP) for any modifications to the maintenance facility under waste discharge identification number 836I000550. An NOI to comply with the IGP and an SWPPP would be required for the proposed new O&M facility.

Regional NPDES Permits

In addition to the statewide general permits, elements of the project would need to comply with general permits for dewatering and for discharges to the municipal storm sewer system issued by the Los Angeles and Santa Ana Regional Water Quality Control Boards (RWQCBs).

Dewatering Permit

Care is required for the removal of nuisance water resulting from construction activities such as dewatering because of the high turbidity and other pollutants associated with this activity. The WVC Project could require dewatering during construction. The Los Angeles RWQCB's permit for discharges of groundwater from construction and project dewatering to surface waters is identified as No. R4-2013-0095 (NPDES No. CAG994004). The Santa Ana RWQCB's Dewatering Permit Order is identified as R8-2009-0003 (NPDES No. CAG998001). These permits cover General Waste Discharge Requirements for Discharges

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2 Standard Industrial Classification (SIC) is a Federal government system for classifying industries by a four-digit code. It is being supplanted by the North American Industrial Classification System (NAICS), but SIC codes are still referenced by the RWQCB in identifying development sites subject to regulation under the NPDES permit. Information and an SIC search function are available at http://www.bls.gov/bls/NAICS.htm .

3 http://www.osha.gov/pls/imis/sic_manual.display?id=33&tab=group

to Surface Water Which Pose an Insignificant (De Minimis) Threat to Water Quality from dewatering activities. Temporary excavations that require dewatering, like those associated with construction of the bus shelters, could discharge pollutants (primarily by entraining silt and clay, but also from encountering chemicals and other contaminants) through releases of construction water directly to the environment, which could violate Los Angeles or Santa Ana RWQCBs Water Quality Objectives (WQOs). If dewatering were required, the project would apply for coverage under these permits.

Municipal Separate Storm Sewer System Permit

The Los Angeles RWQCB has issued an NPDES permit (Order No. R4-2012-0175, NPDES No. CAS004001) with the County of Los Angeles, and the City of Pomona is listed as a co-permittee. Likewise, the Santa Ana RWQCB has issued an NPDES permit with the County of San Bernardino (Order No. R8 2010-0036, NPDES No. CAS618036), and the Cities of Montclair, Ontario, Rancho Cucamonga, and Fontana are listed as permittees. The purposes of these NPDES permits are to prohibit non-stormwater discharges and to reduce pollutants in discharges to the “maximum extent practicable” to maintain or attain WQOs that are protective of beneficial uses or receiving waters.

Omnitrans is identified in Attachment 3 of Order No. R8-2010-0036 as a potential discharger of urban runoff in the permitted area. Per the NPDES permit, SBCTA/Omnitrans would work cooperatively with the permittees to manage urban runoff. Provisions of the San Bernardino County and Los Angeles County permits require the implementation of management practices to address stormwater runoff quality. The management practices represent best practicable treatment and control of urban runoff discharges. The NPDES permits promote implementation of low impact development (LID) BMPs, where feasible. LID BMPs reduce stormwater pollutant discharges by intercepting rainfall on vegetative canopy. LID BMPs can also reduce stormwater runoff by capturing and infiltrating runoff into existing or amended soils.

Clean Water Quality Certification (Section 401)

Section 401 requires an applicant for a federal license or permit to allow project construction, operation, and maintenance activities that would result in a discharge to waters of the U.S. to obtain state certification that the discharge complies with other provisions of the CWA. The RWQCBs administer the certification program in California. Construction of the proposed project would not occur in a creek or channel. Sediment and other construction-related contaminants would not discharge to waters of the U.S. or to any waters of the State. No temporary or permanent impacts on water bodies within the jurisdictions of the Los Angeles or Santa Ana RWQCB are anticipated. Therefore, a Section 401 Water Quality Certification is not required for the WVC Project.

Water Quality Impairments (Section 303(d))

Section 303(d) requires each state to provide a list of impaired waters that do not meet or are expected not to meet state water quality standards. It also requires each state to develop total maximum daily loads (TMDLs) from the pollution sources for such impaired water bodies.

3.2 State Laws and Requirements

The SWRCB allocates water rights, adjudicates water rights disputes, develops statewide water protection plans, and establishes water quality standards. It also guides the nine RWQCBs in the State of California's (State's) major watersheds.

3.2.1 Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act (Act) requires projects that are discharging or proposing to discharge wastes that could affect the quality of the State's water to file a Report of Waste Discharge with the appropriate RWQCB. The RWQCBs are responsible for implementing CWA Sections 401, 402, and 303(d). The Act also provides for the development and periodic review of the basin plans that designate beneficial uses of California's major rivers and groundwater basins and establish WQOs for those waters. Projects primarily implement basin plans using the NPDES permitting system to regulate waste discharges so that WQOs are met.

3.2.2 California Fish and Game Code (Section 1601 through 1603)

The California Fish and Game Code requires agencies to notify the California Department of Fish and Wildlife (CDFW) 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. If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement would be prepared. The Lake or Streambed Alteration Agreement includes reasonable conditions necessary to protect those resources and must comply with the California Environmental Quality Act (CEQA). Based on a survey of the project area, there are no fish or wildlife resources within the jurisdiction of CDFW. Furthermore, the proposed project does not involve any disturbance in a channel or creek and would therefore not create any direct or indirect temporary or permanent impacts on CDFW jurisdictional areas; therefore, a Lake or Streambed Alteration Agreement would not be required for the proposed project.

3.3 Regional and Local Requirements

The proposed project area spans two watersheds (Chino Creek and Middle Santa Ana River), as shown in Table 2-1. Most of the Chino Creek watershed is under the jurisdiction of the Santa Ana RWQCB, but a portion is under the jurisdiction of the Los Angeles RWQCB. In the project area, the jurisdictional boundary between the two RWQCBs does not follow the watershed boundary, but instead follows the County line. Beneficial uses and WQOs for receiving waters in the Chino Split Hydrologic Sub-Area (HSA) thus have been identified in both the *Los Angeles Basin Plan* (Los Angeles RWQCB, 1994) and the *Santa Ana River Basin Plan* (Santa Ana RWQCB, 1995).

Table 3-1. Watersheds and Sub-Watershed Areas

County	Regional Water Quality Control Board	Hydrologic Sub-Area	City	Watershed	Sub-Watershed
Los Angeles	Los Angeles	Chino Split	Pomona	Chino Creek	Upper Chino Creek
San Bernardino	Santa Ana		Montclair	Chino Creek	Middle Chino Creek
			Ontario	Chino Creek	Lower Chino Creek
			Rancho Cucamonga	Chino Creek	Upper Cucamonga Creek
				Chino Creek	Lower Cucamonga Creek
			Fontana	Middle Santa Ana River	East Etiwanda Creek – Santa Ana River

Source: Santa Ana Regional Water Quality Control Board, 2016.

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4.0 EXISTING CONDITIONS

This section describes the affected environment for water quality and stormwater runoff. It includes a range of topics related to water resources, including receiving water bodies and water quality. Surface water resources are important for fish and wildlife habitat, urban and agricultural, industrial service water supply, recreation, and conveying floodwaters. Groundwater is also an important source of urban water supply and groundwater recharge.

4.1 General Setting

The general setting is the same for each of the build alternatives. The watersheds, groundwater, drainages, and direct and indirect receiving waters are consistent among the No Build Alternative and the build alternatives. Under the proposed project, the build alternatives both have the same general setting because the proposed project is being developed within an existing facility with minor changes.

The project is in the Santa Ana River hydrologic unit and in the Chino Split hydrologic subarea (HSA) (Santa Ana Regional Water Quality Control Board, 2016). The Chino Split HSA covers approximately 190,515 acres. Offsite receiving water bodies within the proposed project area are identified in Table 4-1.

Table 4-1. Offsite Receiving Water Bodies

Water Body	Length of Reach (miles)
San Antonio Creek	23
West Cucamonga Creek	
Cucamonga Creek Reach 1	9.6
Day Creek	15
East Etiwanda Creek	
San Sevaine Channel	2.8
Chino Creek Reach 2 (Beginning of concrete channel to confluence with San Antonio Creek)	2.5
Chino Creek Reach 1B (Mill Creek confluence to start of concrete lined channel)	7.0
Chino Creek Reach 1A (Santa Ana River Reach 5 confluence to just downstream of confluence with Mill Creek)	0.79
Santa Ana River Reach 3	26
Santa Ana River Reach 2	20
Santa Ana River Reach 1	10
Huntington Beach State Park	5.8

Source: Santa Ana Regional Water Quality Control Board, 2016.

4.1.1 Hydrology

The following hydrologic features exist in the region and in the project vicinity. Major surface water features include channels, floodplains, and groundwater aquifers. These features are described in the following subsections and illustrated in Figure 4-1. The State of California is subdivided on the basis of hydrology according to the following classification convention:

- **Hydrologic Region (HR):** Large-scale topographic and geologic divisions. California has 9 HRs, including the Santa Ana HR.
- **Hydrologic Unit (HU):** Defined by surface drainage. May include a major river watershed, ground water basin, or closed drainage.
- **Hydrologic Area (HA):** Major subdivision of a HU, such as by major tributaries, ground water attributes, or streams.
- **Hydrologic Sub-Area HSA):** Major segment of a HA with significant geographical integrity or hydrological homogeneity.

Regional Hydrology

The Santa Ana Region includes a group of connected inland basins and open coastal basins drained by surface streams that generally flow southwestward to the Pacific Ocean (Santa Ana Regional Water Quality Control Board [RWQCB], 1995). The boundaries among California's nine regions are usually hydrologic divides that separate watersheds; however, the boundary between the Los Angeles Region 4 and the Santa Ana Region 8 is the Los Angeles County line. Because the Los Angeles County line only approximates the hydrologic divide, part of the Pomona area drains into the jurisdiction of the Santa Ana RWQCB.

Local Hydrology

Precipitation and Climate

Climate in the project area is characterized by relatively hot, dry summers and cool winters with intermittent precipitation. The largest portion (73 percent) of average annual precipitation occurs from December through March, and rainless periods of several months are common in the summer. Precipitation nearly always falls as rain in the lower elevations and mostly as snow above approximately 6,000 feet above mean sea level (msl) in the San Bernardino Mountains. Mean annual precipitation ranges from approximately 12 inches near Riverside to almost 20 inches at the base of the San Bernardino Mountains, and to greater than 35 inches along the crest of the mountains. The long-term (water years 1883-84 through 2001-02) mean annual precipitation recorded at the San Bernardino County Hospital Gage is 16.4 inches. The historical record indicates that a period of above-average

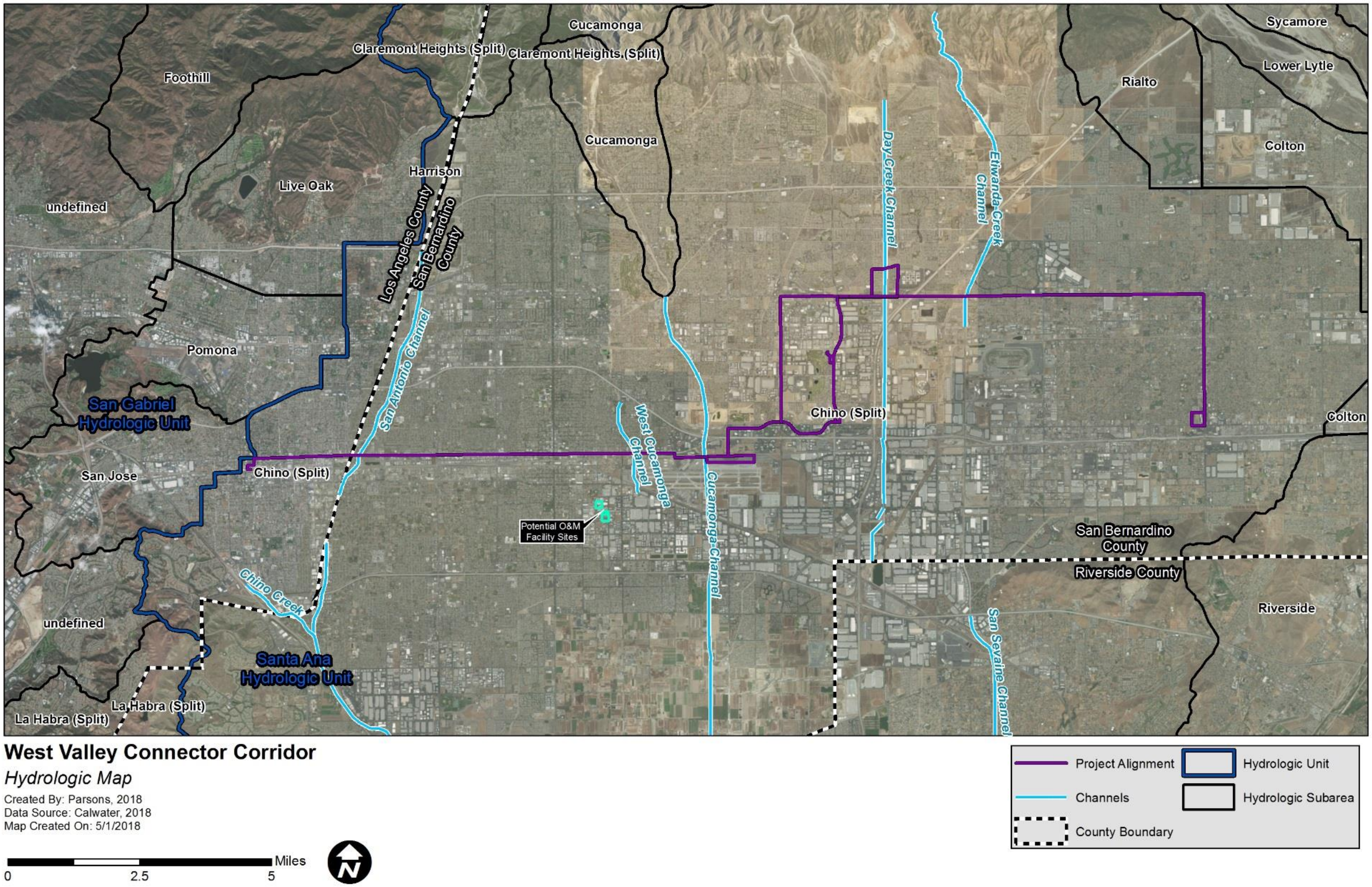

Figure 4-1: Regional Hydrology

or below-average precipitation can last more than 30 years, such as the dry period that extended from 1947 to 1977. Historical stream flow statistics for the Santa Ana River at the Metropolitan Water District of Southern California crossing (Metropolitan Crossing, located near the Riverside Narrows) show that flows vary widely from year to year. The median annual flow for the Santa Ana River at the Metropolitan Crossing is 75,900 acre-feet per year. During water years 1969-1970 through 2000-2001, annual flows ranged from a high of 301,000 acre-feet to a low of 9,800 acre-feet. These data are indicative of highly variable stream flows (Upper Santa Ana Water Resources Association, 2007).

Surface Streams

The following sections describe the surface hydrology within the proposed project area.

San Antonio Creek. San Antonio Creek is a major stream in Los Angeles County and San Bernardino County. The creek drains southward from Mount San Antonio in the San Gabriel Mountains into Chino Creek, a tributary of the Santa Ana River. San Antonio Creek rises on the southeastern flank of Mount San Antonio (Mount Baldy) and then flows southwest through San Antonio Canyon and past Mount Baldy Village, then south, winding through the Angeles National Forest. At the end of the canyon, it reaches San Antonio Dam but, after passing through the dam, the stream is usually dry. It flows south through a concrete flood control channel, passing through the cities of Pomona Valley, including Claremont, Montclair, and Chino. The creek joins Chino Creek, a tributary of the Santa Ana River (United States Geological Survey, 2016).

Chino Creek. Chino Creek is a major stream in San Bernardino County. Rising from underground sources in southern Pomona, the creek drains a basin of about 218 square miles from the San Gabriel Mountains to the Santa Ana River, of which it is a tributary. Below its confluence with San Antonio Creek, Chino Creek flows parallel to State Route 71 and into Prado Basin. Below Prado Dam, it flows south to its confluence with Santa Ana River.

West Cucamonga Creek. West Cucamonga Creek carries flows from Ontario. The upstream end of the channel is located north of Church Street, from where it continues in a southerly direction to the infiltration basins north of State Route (SR) 60. The outfall for the basins is Cucamonga Creek.

Cucamonga Creek. The Cucamonga Creek watershed is in San Bernardino County and Riverside County, and includes portions of the cities of Chino, Ontario, Rancho Cucamonga, and Upland. The upstream reach of the Cucamonga Creek Channel originates at the Cucamonga Debris Basin, from where it continues in a southeasterly direction, having a confluence with a channel that brings flows from Thorpe Canyon Dam. From this confluence, the channel crosses SR 210. Deer Creek Channel is the largest tributary of Cucamonga Creek, where the confluence is located just south of the eastbound Interstate-

10 bridge. From its confluence with Deer Creek Channel, the Cucamonga Creek Channel continues to the south under Ontario International Airport to the confluence with Lower Deer Creek, approximately 3.4 miles downstream. Downstream of this confluence, the channel continues south for approximately 3.8 miles, where it discharges into Prado Basin.

Day Creek. Day Creek channel is a concrete lined open channel that conveys flood flows through the area. It begins as a trapezoidal channel at the Riverside Basin, located to the west of the Mira Loma Space Center north of Mission Boulevard. The channel then proceeds southeasterly, running parallel to the Union Pacific Railroad tracks, to a transition to a rectangular channel west of Etiwanda Avenue. South of Mission Boulevard, the double reinforced concrete box transitions to a trapezoidal channel. This channel runs southerly, following approximately what was Day Creek's natural watercourse, down to and across Limonite Avenue, where it transitions to an improved earthen swale that ends in the Santa Ana River (Riverside County Flood Control and Water Conservation District, 1998).

East Etiwanda Creek. East Etiwanda Creek consists of a system of channels and basins that mitigate drainage within the watershed by attenuating flows for the control of runoff from developed areas. The drainage area for East Etiwanda Creek includes areas within the City of Fontana and unincorporated areas of San Bernardino County. Flow from East Etiwanda Creek north of Foothill Boulevard is handled in a separate system. South of Foothill Boulevard, flow from East Etiwanda Creek is handled in a combined system with flow from San Sevaine Channel (County of San Bernardino, 1989).

San Sevaine Channel. San Sevaine Channel conveys storm runoff from the cities of Rancho Cucamonga and Fontana and unincorporated area of San Bernardino County. The channel discharges to the Santa Ana River in Corona.

Groundwater Hydrology

The Chino Basin is one of the largest groundwater basins in southern California, covering approximately 235 square miles of the Upper Santa Ana River Valley. The basin is bounded by the Rialto-Colton Fault on the northeast, the Jurupa Mountains and La Sierra Hills to the southeast, the Central Avenue Fault to the southwest, and the San Jose Fault and Red Hill Fault to the northwest.

Inland Empire Utilities Agency (IEUA), Chino Basin Watermaster (CBWM), Chino Basin Water Conservation District, and San Bernardino County Flood Control District are partners in the implementation of the Chino Basin Recycled Water Groundwater Recharge Program. The recharge program is part of a comprehensive program to enhance water supply reliability and improve the groundwater quality in local drinking water wells throughout the Chino Groundwater Basin by increasing the recharge of stormwater, imported water, and recycled water. Recharge basins used in the Recycled Water Groundwater Recharge Program and near the proposed project area include the Brooks Street Basin and the Turner

Basin. Groundwater elevation contours evaluated in Spring 2014 indicate that groundwater flows in a south-southwest direction from the primary areas of recharge in the northern parts of the Chino Basin toward the Prado Basin in the south (IEUA, 2016). In its Basin Plan, the Santa Ana RWQCB references the Chino Basin as the Chino North groundwater management zone.

Within the Los Angeles RWQCB jurisdiction, the project overlies the Raymond groundwater basin. The Raymond Basin is in the northwestern part of San Gabriel Valley, in eastern Los Angeles County. The Raymond Basin includes the water-bearing sediments bounded by the contact with consolidated basement rocks of the San Gabriel Mountains on the north and the San Rafael Hills on the southwest. The west boundary is delineated by a drainage divide at Pickens Canyon Wash, and the southeast boundary is the Raymond Fault. Natural recharge to the basin is mainly from direct percolation of precipitation and percolation of ephemeral streamflow from the San Gabriel Mountains in the north. The principal streams bringing surface inflow are the Arroyo Seco, Eaton Creek, and Santa Anita Creek. Some stream runoff is diverted into spreading grounds, and some is impounded behind small dams, allowing the water to infiltrate and contribute to groundwater recharge of the basin. An unknown amount of underflow enters the basin from the San Gabriel Mountains through fracture systems (Los Angeles RWQCB, 1994).

Soil Erosion Potential

According to the Natural Resource Conservation Service soils maps (U.S. Department of Agriculture, 2014), soils within the project limits include Delhi fine sand; Hanford coarse sandy loam; Tujunga loamy sand; and Tujunga gravelly loamy sand. These soils are classified into Hydrologic Soils Group (HSG) A. Soils classified into HSG A typically exhibit a low runoff potential coupled with a high infiltration rate.

Hydrologic Conditions of Concern Exemption Areas

The project corridor and O&M facility would be located in Hydrologic Conditions of Concern (HCOC) exemption areas. Appendix F (HCOC Exemption Criteria and Map) to the County of San Bernardino's Technical Guidance Document for the Water Quality Management Plan (County of San Bernardino, 2013) identifies areas that are upstream of a sump, or are built out, or where urban runoff is diverted to a storage area, such as Prado Dam. Facilities located in these HCOC exemption areas do not require a HCOC analysis or implementation of hydromodification control measures.

4.2 Water Quality Objectives/Standards and Beneficial Uses

4.2.1 Surface Water Quality Objectives/Standards and Beneficial Uses

As required by the Porter-Cologne Act, the Los Angeles and Santa Ana RWQCBs have established WQOs for waters within their jurisdictions to protect the beneficial uses of those waters and published them in their *Basin Plans* (Los Angeles RWQCB, 1994; Santa Ana RWQCB, 1995). The *Basin Plans* also identify implementation programs to achieve these WQOs and require monitoring to evaluate the effectiveness of these programs. WQOs 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 reasonably affected. The designated beneficial uses for receiving waters within the project corridor are displayed in Table 4-2. Tables 4-3 and 4-4 identify the narrative objectives for the Los Angeles and Santa Ana RWQCBs, respectively. In addition, the *Basin Plans* list numeric WQOs for the water bodies that the proposed project discharges to, namely San Antonio Creek in the Los Angeles RWQCB's jurisdiction and West Cucamonga Creek, Cucamonga Creek, Day Creek, East Etiwanda Creek, and San Sevaine Creek in the Santa Ana RWQCB's jurisdiction. Tables 4-5 and 4-6 summarize these numeric objectives noted in the *Basin Plans*.

Table 4-2. Beneficial Uses of Receiving Waters Affected by the Proposed Project

RWQCB	Inland Surface Stream	MUN	AGR	GWR	IND	POW	PROC	REC1	REC2	WARM	LWRM	COLD	BIOL	SPWN	MAR	WILD	RARE
Los Angeles	San Antonio Creek	•	•	•		•	•			•		•				•	
Santa Ana	San Antonio Creek	•	•	•	•	•	•	•	•			•				•	
	Cucamonga Creek Reach 1 - Confluence with Mill Creek to 23rd Street in Upland	+		•				U*	•		•					•	
	Day Creek (Day Canyon Creek)	•		•			•	•	•			•				•	
	East Etiwanda Creek	•		•			•	•	•			•				•	•
	San Sevaine (Valley Reach)	I		I				I	I	I						I	
	Chino Creek Reach 2 (Beginning of Concrete Channel south of Serranos Road to confluence with San Antonio Creek)	+		•				•	•		•					•	
	Chino Creek Reach 1B (Mill Creek confluence to start of concrete-lined channel south of Los Serranos Road)	+						•*	•	•						•	•
	Chino Creek Reach 1A (Santa Ana River confluence to downstream of confluence with Mill Creek – Prado Area)	+						•	•	•						•	•
	Santa Ana River Reach 3	+	•	•				•	•	•				•		•	•
	Santa Ana River Reach 2	+	•	•				•	•	•						•	•
	Santa Ana River Reach 1	+						•*	•	I						I	
	Huntington Beach Wetlands	+						•	•				•	•	•	•	•

• Present or Potential Beneficial Use
I Intermittent Beneficial Use
+ Excepted from Municipal and Domestic Supply
* Access prohibited in some portions by San Bernardino County Flood Control District
** Intermittent Beneficial Use
U REC 1 and/or REC 2 are not attainable as determined by Use Attainability Analyses

Beneficial Use Definitions: MUN (Municipal and Domestic Supply); AGR (Agricultural Supply); IND (Industrial Service Supply); POW (Hydropower Generation); PROC (Industrial Process Supply); GWR (Groundwater Recharge); REC1 (Water Contact Recreation); REC2 (Non-Contact Water Recreation); WARM (Warm Freshwater Habitat); LWRM (Limited Warm Freshwater Habitat); COLD (Cold Freshwater Habitat); BIOL (Preservation of Biological Habitats of Special Significance); MAR (Marine Habitat); SPWN (Spawning, Reproduction and Development); WILD (Wildlife Habitat); RARE (Rare, Threatened or Endangered Species).

Source: Los Angeles RWQCB, 1994, and Santa Ana RWQCB, 1995.

Table 4-3. Los Angeles RWQCB Narrative Water Quality Objectives for Inland Surface Waters

Constituent	Narrative Objective
Ammonia	Ammonia concentrations in receiving waters shall not exceed the values listed for the corresponding instream conditions in Tables 3-1 to 3-4 of the *Basin Plan*.
Bioaccumulation	Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels that are harmful to aquatic life or human health.
Biological Oxygen Demand (BOD_5)	Waters shall be free of substances that result in increases in the BOD that adversely affect beneficial uses.
Biostimulatory Substances	Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.
Chlorine, Total Residual	Chlorine residual shall not be present in surface water discharges at concentrations that exceed 0.1 milligram per liter (mg/L) and shall not persist in receiving waters at any concentration that causes impairment of beneficial uses.
Color	Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.
Oxygen, Dissolved	At a minimum, the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5 mg/L, except where natural conditions cause lesser concentrations. The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 6 mg/L as a result of waste discharges. The dissolved oxygen content of all surface waters designated as COLD shall not be depressed below 6 mg/L as a result of waste discharges. The dissolved oxygen content of all surface waters designated as both COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.
Exotic Vegetation	Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects beneficial uses.
Floating Material	Waters shall not contain floating materials, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
pH	The pH of inland surface waters shall not be depressed below 6.5 nor raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed by more than 0.5 units from natural conditions as a result of waste discharge.
Chemical Constituents	Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use. Water designated for use as Domestic or Municipal Supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits set forth in California Code of Regulations, Title 22, Table 64431-A of section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), and Table 64444-A of Section 64444 (Organic Chemicals). This incorporation by reference is prospective, including future changes to the incorporated provisions as the changes take effect. (See *Basin Plan* Tables 3-5, 3-6, and 3-7.)

Table 4-3. Los Angeles RWQCB Narrative Water Quality Objectives for Inland Surface Waters

Constituent	Narrative Objective
Methylene Blue-Activated Substances (MBAS)	Inland surface waters shall not have MBAS concentrations greater than 0.5 mg/L in waters designated MUN.
Mineral Quality	Numerical mineral WQOs for individual surface waters are contained in Table 3-8 of the Basin Plan.
Nitrogen (Nitrate, Nitrite)	Waters shall not exceed 10 mg/L as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N) or as otherwise designated in Table 3-8.
Oil and Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, or which cause nuisance or which otherwise adversely affect beneficial uses.
Pesticides	Water designated for use as MUN shall not contain concentrations of pesticides in excess of the limiting concentrations specified in California Code of Regulations, Title 22, Table 64444-A of Section 64444 (Organic Chemicals), which is incorporated by reference into the *Basin Plan*. This incorporation by reference is prospective, including future changes to the incorporated provisions as the changes take effect. (See *Basin Plan* Table 3-7.)
Polychlorinated Biphenyls (PCBs)	Pass-through or uncontrollable discharges to waters of the Region, or at locations where the waste can subsequently reach water of the Region, are limited to 70 mg/L (30-day average) for protection of human health and 14 mg/L and 30 mg/L (daily average) to protect aquatic life in inland fresh waters and estuarine waters, respectively.
Radionuclides	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations, which is incorporated by reference into the *Basin Plan*. The incorporation by reference is prospective, including future changes to the incorporated provisions as the changes take effect. (See Table 3-9 in the *Basin Plan*.)
Solid, Suspended, or Settleable Materials	Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.
Taste and Odor	Waters shall not contain taste or odor-producing substances in concentrations that produce undesirable tastes or odors to fish flesh or other edible aquatic resources, cause nuisance, or adversely affect beneficial uses.
Temperature	The natural receiving water temperature of regional waters shall not be altered unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in temperature does not adversely affect beneficial uses. Alterations that are allowed must meet the requirements below.

Table 4-3. Los Angeles RWQCB Narrative Water Quality Objectives for Inland Surface Waters

Constituent	Narrative Objective
	For waters designated WARM, water temperature shall not be altered by more than 5 degrees Fahrenheit (°F) above the natural temperature. At no time shall these WARM-designated waters be raised above 80°F as a result of waste discharges. For waters designated COLD, water temperature shall not be altered by more than 5°F above the natural temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the RWQCB. The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, other control water. There shall be no acute toxicity in ambient waters, including mixing zones. The acute toxicity objective for discharges dictates that the average survival in undiluted effluent for any three consecutive 96-hour static or continuous flow bioassay tests shall be at least 90% with no single test having less than 70% survival when using an established EPA, State Board, or other protocol authorized by the RWQCB. There shall be no chronic toxicity in ambient waters, outside mixing zones. To determine compliance with this objective, critical life stage tests for at least three species with approved testing protocols shall be used to screen for the most sensitive species. The test species used for screening shall include a vertebrate, an invertebrate, and an aquatic plant. The most sensitive species shall then be used for routine monitoring. Typical endpoints for chronic toxicity tests include hatchability, gross morphological abnormalities, survival, growth, and reproduction. Effluent limits for specific toxicants can be established by the RWQCB to control toxicity identified under Toxicity Identification Evaluations.
Turbidity	Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits: • Where natural turbidity is between 0 and 50 nephelometric turbidity units (NTU), increases shall not exceed 20%. • Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%. Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific waste discharge requirements (WDRs).

Source: Los Angeles RWQCB, 1994.

Table 4-4. Santa Ana RWQCB Narrative Water Quality Objectives for Inland Surface Waters

Constituent	Narrative Objective
Algae	Waste dischargers shall not contribute to excessive algal growth in inland surface receiving waters.
Ammonia, Un-ionized	To prevent chronic toxicity to aquatic life in the Santa Ana River, Reaches 2, 3, and 4, Chino Creek, Mill Creek (Prado Area), Temescal Creek, and San Timoteo Creek, discharges to these water bodies shall not cause the concentration of un-ionized ammonia (as nitrogen) to exceed 0.098 mg/L (NH_3-N) as a 4-day average.
Bacteria, Coliform	MUN: Total coliform: less than 100 organisms/100 milliliters (mL). REC-1: Fecal coliform: log mean less than 200 organisms/100 mL based on 5 or more samples/30-day period, and not more than 10% of the samples exceed 400 organisms/100 mL for any 30-day period. REC-2: Fecal coliform: average less than 2,000 organisms/100 mL and not more than 10% of samples exceed 4,000 organisms/100 mL for any 30-day period.
Boron	Boron concentrations shall not exceed 0.75 mg/L in inland surface waters of the region as a result of controllable water quality factors.
Chemical Oxygen Demand (COD)	Waste discharges shall not result in increases in COD levels in inland surface waters that exceed the values shown in Table 4-1 of the *Basin Plan* or that adversely affect beneficial uses.
Chlorides	The chloride objectives listed in Table 4-1 of the Basin Plan shall not be exceeded as a result of controllable water quality factors.
Chlorine, Residual	To protect aquatic life, the chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish, or other inland surface water resources used for human consumption shall not be impaired.
Oxygen, Dissolved	The dissolved oxygen content of surface waters shall not be depressed below 5.0 mg/L for waters designated WARM, or 6.0 mg/L for waters designated COLD, as a result of controllable water quality factors. In addition, waste discharges shall not cause the median dissolved oxygen concentration to fall below 85% of saturation or the 95th percentile concentration or fall below 75% of saturation within a 30-day period.
Floatables	Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, which cause a nuisance or adversely affect beneficial uses.
Fluoride	Fluoride concentrations shall not exceed values specified in the *Basin Plan* for inland surface waters designated MUN as a result of controllable water quality factors.
Hardness	The objectives listed in Table 4-1 of the *Basin Plan* shall not be exceeded as a result of controllable water quality factors. If no hardness objective is listed in Table 4-1, the hardness of receiving waters used for MUN shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.
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.

Table 4-4. Santa Ana RWQCB Narrative Water Quality Objectives for Inland Surface Waters

Constituent	Narrative Objective
Metals	The equations listed in the Basin Plan represent the applicable Site-Specific Water Quality Objectives.
Methylene Blue-Activated Substances (MBAS)	MBAS concentrations shall not exceed 0.05 mg/L in inland surface waters designated MUN as a result of controllable water quality factors.
Nitrate	Nitrate-nitrogen concentrations shall not exceed 45 mg/L (as NO_3) or 10 mg/L (as N) in inland surface waters designated MUN as a result of controllable water quality factors.
Nitrogen, Total Inorganic	The objectives in Table 4-1 of the *Basin Plan* shall not be exceeded as a result of controllable water quality factors.
Oil and Grease	Waste discharges shall not result in deposition of oil, grease, wax, or other material in concentrations that result in a visible film or in coating objects in the water, or that cause a nuisance or adversely affect beneficial uses.
Radioactivity	Radioactivity materials shall not be present in waters of the region in concentrations that are deleterious to human, plant, or animal life. Waters designated MUN shall meet the limits specified in Title 22 of the California Code of Regulations and listed in the *Basin Plan*.
Sodium	The sodium objectives listed in *Basin Plan* Table 4-1 shall not be exceeded as a result of controllable water quality factors.
Solids, Suspended and Settleable	Inland surface waters shall not contain suspended or settleable solids in amounts that cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.
Sulfate	The objectives listed in Table 4-1 of the *Basin Plan* shall not be exceeded as a result of controllable water quality factors.
Sulfides	The dissolved sulfide content of inland surface waters shall not be increased as a result of controllable water quality factors.
Surfactants (surface-active agents)	Waste discharges shall not contain concentrations of surfactants that result in foam in the course of flow or use of the receiving water, or which adversely affect aquatic life.
Taste and Odor	The inland surface waters of the region shall not contain, as a result of controllable water quality factors, taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses. The natural taste and odor of fish, shellfish, or other regional inland surface water resources used for human consumption shall not be impaired.
Temperature	The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the RWQCB that such alteration in temperature does not adversely affect beneficial uses. The temperature of waters designated COLD shall not be increased by more than 5°F as a result of controllable water quality factors. The temperature of waters designated WARM shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors. Lake temperatures shall not be raised more than 4°F above established normal values as a result of controllable water quality factors.

Table 4-4. Santa Ana RWQCB Narrative Water Quality Objectives for Inland Surface Waters

Constituent	Narrative Objective
Dissolved Solids, Total (Total Filtrable Residue)	The dissolved mineral content of the waters of the region, as measured by the total dissolved solids test (Standard Methods for the Examination of Water and Wastewater, 16th Ed., 1985: 209B (180 °C), p. 95) shall not exceed the specific objectives listed in Table 4-1 as a result of controllable water quality factors.
Toxic Substances	Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health. The concentration of contaminants in waters that are existing or potential sources of drinking water shall not occur at levels that are harmful to human health. The concentration of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.
Turbidity	Increases in turbidity that result from controllable water quality factors shall comply with the following: *Natural Turbidity* — *Maximum Increase* 0-50 NTU — 20% 50-100 NTU — 10 NTU *Greater than* 100 NTU — 10%

Source: Santa Ana RWQCB, 1995.

Table 4-5. Los Angeles RWQCB Numeric Water Quality Objectives

Watershed/ Stream Reach[1]	Water Quality Parameter (mg/L)		
	TDS	Sulfate	Chloride
San Antonio Creek[2]	225	25	6

[1] All reference to watersheds, streams, and reaches include all tributaries. WQOs are applied to all waters tributary to those specifically listed in the table.

[2] This watercourse is primarily located in the Santa Ana region. The WQOs for this stream have been established by the Santa Ana RWQCB.

Source: Los Angeles RWQCB, 1994.

Table 4-6. Santa Ana RWQCB Numeric Water Quality Objectives

Inland Surface Stream	Water Quality Parameter (mg/L)						
	Total Dissolved Solids	Hardness	Sodium	Chloride	Total Inorganic Nitrogen	Sulfate	Chemical Oxygen Demand
San Antonio Creek	225	150	20	6	4	25	5
Day Creek	200	100	15	4	4	25	5
East Etiwanda Wash	200	100	15	4	4	25	5
San Sevaine	200	+	+	+	+	+	+

+ Numeric objectives have not been established; narrative objectives apply.

Source: Santa Ana RWQCB, 1995.

4.2.2 Groundwater Quality Objectives/Standards and Beneficial Uses

Beneficial uses for groundwater for the Los Angeles and Santa Ana RWQCBs jurisdictions are designated in their *Basin Plans*. Likewise, groundwater quality objectives for the Los Angeles RWQCB and Santa Ana RWQCB are also designated in their *Basin Plans*. The Santa Ana RWQCB and Los Angeles RWQCB have designated narrative and numeric groundwater quality objectives. Table 4-7 summarizes beneficial uses for groundwater. Tables 4-8 through 4-10 summarize the narrative and numeric groundwater objectives applicable within the proposed project boundary.

Table 4-7. Groundwater Beneficial Uses

RWQCB	Groundwater Management Zone	Beneficial Use			
		MUN	AGR	IND	PROC
Los Angeles	Raymond	•	•	•	•
Santa Ana	Chino North	•	•	•	•
Notes: MUN – Municipal and Domestic Supply, AGR – Agricultural Supply, IND – Industrial Service Supply, PROC – Industrial Process Supply.					

Source: Los Angeles RWQCB, 1994, and Santa Ana RWQCB, 1995.

Table 4-8. Water Quality Objectives for Groundwaters in the Santa Ana RWQCB

Constituent	Water Quality Objectives for Groundwater
Arsenic	Arsenic concentrations shall not exceed 0.05 mg/L in groundwater designated MUN as a result of controllable water quality factors.
Bacteria	Total coliform numbers shall not exceed 2.2 organisms/100 mL median over any 7-day period in groundwaters designated MUN as a result of controllable water quality factors.
Barium	Barium concentrations shall not exceed 1.0 mg/L in groundwaters designated MUN as a result of controllable water quality factors.
Boron	Boron concentrations shall not exceed 0.75 mg/L in groundwaters of the region as a result of controllable water quality factors.
Chloride	Chloride concentrations shall not exceed 500 mg/L in groundwaters of the region designated as MUN as a result of controllable water quality factors.
Color	Waste discharges shall not result in coloration of the receiving waters, which causes a nuisance or adversely affects beneficial uses.
Cyanide	Cyanide concentrations shall not exceed 0.2 mg/L in groundwaters designated MUN as a result of controllable water quality factors.
Dissolved Solids, Total (Total Filtrable Residue)	The dissolved mineral content of the waters of the region, as measured by the total dissolved solids test (Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998: 2540C (180 °C), p. 2-56), shall not exceed the specific objectives listed in Table 4-1 as a result of controllable water quality factors.

Table 4-8. Water Quality Objectives for Groundwaters in the Santa Ana RWQCB

Constituent	Water Quality Objectives for Groundwater
Fluoride	Fluoride concentrations shall not exceed 1.0 mg/L in groundwaters designated MUN as a result of controllable water quality factors.
Hardness	The hardness of receiving waters used for MUN shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.
Metals	Metal concentrations shall not exceed the values listed in the Basin Plan in groundwaters designated MUN as a result of controllable water quality factors.
Methylene Blue Active Substances (MBAS)	MBAS concentrations shall not exceed 0.05 mg/L in groundwaters designated MUN as a result of controllable water quality factors.
Nitrate	Nitrate-nitrogen concentrations listed in Table 4-1 of the Basin Plan shall not be exceeded 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.
pH	The pH of groundwater shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.
Radioactivity	Radioactivity materials shall not be present in the waters of the region in concentrations that are deleterious to human, plant, or animal life. Groundwaters designated MUN shall meet the limits specified in Title 22, California Code of Regulations and as listed in the Basin Plan.
Sodium	Groundwaters designated AGR shall not exceed the sodium absorption ratio of 9 as a result of controllable water quality factors.
Sulfate	Sulfate concentrations shall not exceed 500 mg/L in groundwaters of the region designated MUN as a result of controllable water quality factors.
Tastes and Odors	The groundwaters of the region shall not contain, as a result of controllable water quality factors, taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses.
Toxic Substances	All waters of the region shall be maintained free of substances in concentrations that are toxic, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Source: Santa Ana RWQCB, 1995.

Table 4-9. Santa Ana RWQCB Groundwater Management Zone Water Quality Objectives

Groundwater Management Zone	Water Quality Parameter (mg/L)					
	Total Dissolved Solids	Hardness	Sodium	Chloride	Nitrate as Nitrogen	Sulfate
Chino – North "maximum benefit"[1]	420	--	--	--	5.0	--

[1] "Maximum benefit" objectives apply unless RWQCB determines that lowering of water quality is not of maximum benefit to the people of the state; in that case, "antidegradation" objectives apply (for Chino North, antidegradation objectives for Chino 1, 2, 3 would apply if maximum benefit is not demonstrated).

Source: Santa Ana RWQCB, 1995.

Table 4-10. Regional Objectives for Groundwaters in the Los Angeles RWQCB

Constituent	Water Quality Objectives for Groundwater
Bacteria	In groundwaters used for domestic or municipal supply, the concentration of coliform organisms over any 7-day period shall be less than 1.1/100 mL.
Chemical Constituents	Groundwaters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.
Mineral Quality	Numerical mineral quality objectives for individual groundwater basins shall comply with the WQOs listed in Table 3-10 of the Basin Plan.
Nitrogen (Nitrate, Nitrite)	Groundwaters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen, 45 mg/L as nitrate, 10 mg/L as nitrate-nitrogen, or 1 mg/L as nitrite-nitrogen.
Tastes and Odor	Groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
Toxic Substances	All waters of the region shall be maintained free of substances in concentrations that are toxic, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Source: Los Angeles RWQCB, 1994.

4.3 Existing Water Quality

4.3.1 Regional Water Quality

California's Porter-Cologne Water Quality Control Act and the federal Clean Water Act (CWA) direct that water quality protection programs be implemented to protect and restore the chemical, physical, and biological integrity of the State's waters. California Assembly Bill (AB) 982 (Statutes of 1999) required the State Water Resources Control Board (SWRCB) to assess and report on the State's water quality monitoring programs. AB 982 envisioned that ambient monitoring would be independent of other water quality regulatory programs and be a measure of: (1) the overall quality of the State's water resources, and (2) the overall effectiveness of the prevention, regulatory, and remedial actions taken by the SWRCB and the nine RWQCBs. To implement this directive, modest funding for ambient surface water quality monitoring was allocated to the SWRCB (and thereby to the RWQCBs) beginning in State Fiscal Year 2000–2001. AB 982 also required the SWRCB to prepare a proposal for a comprehensive surface water quality monitoring program. That proposal, entitled *Proposal for a Comprehensive Ambient Surface Water Quality Monitoring Program*, was transmitted to the State Legislature on November 30, 2000.

Using the available funding, the SWRCB created the Surface Water Ambient Monitoring Program (SWAMP). SWAMP is intended to provide a measure of the State's ambient water quality and the effectiveness of the State's water quality protection programs. SWAMP relies primarily on contractors, such as the University of California, the U.S. Geological Survey (USGS), and others, to collect information on the quality of the State's waters. The following sections summarize SWAMP monitoring activities conducted within the hydrologic area applicable to the West Valley Connector (WVC) Project.

The Santa Ana RWQCB conducted a 6-year study (2006-2011) of the waterways within the Santa Ana River watershed (Santa Ana RWQCB, 2014). The purpose of the study was to determine the integrity of surface waters by sampling the biological (i.e., benthic macroinvertebrates), physical (i.e., in-stream habitat, surrounding riparian habitats), and chemical attributes. During the 2011 sampling events, water quality was measured at 45 locations. Of the 45 locations, 4 are close to and down gradient from the WVC Project, as indicated in Table 4-11.

Table 4-11. Santa Ana River Watershed Sampling Sites

SWAMP Code	Stream Name	Latitude NAD 83	Longitude NAD 83	Elevation (meters)	Collection Date
801RB8197	Chino Creek	33.9827	-117.69921	179	7/11/11
801RB8404	Day Creek	34.05885	-117.54179	298	6/15/11
801RB8521	Chino Creek	33.98065	-117.69542	182	7/6/11
801RB8566	Cucamonga Creek	33.99743	-117.59924	216	6/15/11

Source: Santa Ana RWQCB, 2014.

Appendix A summarizes the quality for the receiving waters identified in Table 4-11.

San Bernardino County monitors the water quality of all watersheds within its jurisdiction in accordance with the municipal separate storm sewer system (MS4) NPDES Permit. All available data and monitoring locations were reviewed to determine if any monitoring data were available for direct or indirect receiving water bodies near the project limits. A summary of constituents that did not meet applicable WQOs at the Cucamonga Creek station during the 2013-2014 monitoring season are presented in Appendix B and are summarized in a narrative form in the following sections.

E. coli concentrations were above the WQO of 113 most probable number (MPN) per 100 milliliters (mL) during all (i.e., two) of the wet weather events and one of two dry weather events. *E. coli* concentrations ranged from non-detect to 30,000 MPN per 100 mL. Total coliform and fecal coliform concentrations were above the WQO of 100 (MPN) per 100 and 400 (MPN) per 100, respectively, during both wet weather monitoring events. Samples for coliform bacteria were not collected or analyzed during the dry weather monitoring events. Streets and roadways are not considered sources for *E. coli,* total coliform, or fecal coliform bacteria.

Samples collected for total suspended solids (TSS) were above the WQO of 30 milligrams per liter (mg/L) during all of the dry weather and wet weather monitoring events. TSS concentrations ranged from 78 to 2,500 mg/L.

Chemical oxygen demand (COD) concentrations were above the WQO of 30 mg/L for all of the dry and wet weather sampling events. COD concentrations ranged from 94 to 310 mg/L.

Total phosphorus concentrations were above the WQO of 0.1 mg/L for all of the dry and wet weather monitoring events. Total phosphorus concentrations ranged from 0.4 to 4.2 mg/L.

The dissolved copper concentration was above the WQO of 7.6 micrograms per liter (µg/L) for one of the two dry weather samples. The dry weather sample that was above the WQO had an estimated concentration of 11 µg/L.

All other applicable WQOs at Site 3 were met during the 2013-2014 monitoring season.

During Fiscal Year 2014-2015, six biweekly dry-weather sampling events were conducted at seven sampling locations to establish a statistical baseline of nitrogen and total dissolved solids (TDS) concentrations. Three locations are associated with the proposed project and, at these locations, concentrated dry weather flows are discharged from San Bernardino's MS4 into open channels. Specifically, flows from the Cucamonga Channel are diverted to the Mill Creek Wetlands for treatment prior to discharge. Flows from the Cypress Channel and San Antonio Creek, when sufficient, enter the Prado Basin. Flows from the San Antonio Channel are upstream of San Antonio Creek. Detailed monitoring results are presented in Appendix C.

The Los Angeles County Department of Public Works monitors the water quality of all watersheds within its jurisdiction in accordance with the MS4 Permit. All available data and monitoring locations were reviewed to determine if any monitoring data were available near the project limits. The closest monitoring station is approximately 20 miles west of the project and is displayed in Table 4-12.

Table 4-12. Los Angeles County Department of Public Works Monitoring Station

Watershed Management Area	Monitoring Station	RWQCB Jurisdiction
Coyote Creek	S13	Los Angeles

Source: Los Angeles County Department of Public Works, 2016.

Some of the constituents that did not meet applicable WQOs at the Coyote Creek mass emission station during the 2012-2013 Wet Weather Monitoring Season are listed in Appendix D and are summarized in a narrative form in the following sections.

Water Quality Constituents

E. coli concentrations were above the WQO of 235 MPN/100 mL during all six storm events monitored for bacteria. *E. coli* concentrations ranged from 4,410 to 29,090 MPN/100 mL. During wet weather high-flow periods, Coyote Creek is subject to a suspension of the water contract recreation (REC)-1 beneficial use (i.e., water contact recreation – full immersion). As a result of this suspension, four of the six wet weather events did not meet the *E. coli* WQO.

The dissolved copper concentration was above the hardness-based WQO for four of the eight wet weather samples collected from Coyote Creek. Dissolved copper concentrations ranged from 10.0 to 52.7 µg/L, whereas hardness ranged from 60 to 230 mg/L.

The dissolved zinc concentration was above the hardness-based WQO for four of the eight wet weather samples collected at Coyote Creek. Dissolved zinc concentrations ranged from 57.0 to 1,120 µg/L.

All other applicable WQOs in Coyote Creek were met during the 2012-2013 wet weather monitoring season.

4.3.2 List of Impaired Waters

The drainage course of water from the proposed project to offsite areas was used to determine what water bodies could be impacted by the project. Table 4-13 summarizes these water bodies by watershed and lists the impairments and established Total Maximum Daily Loads (TMDLs) per the Final California 2014 and 2016 Integrated Report (303(d) List/305(b) Report) (SWRCB, 2017).

Caltrans has conducted runoff monitoring and characterization studies for a range of transportation facilities throughout California. The monitoring has various objectives, such as complying with the NPDES permit requirements; producing representative and scientifically credible runoff data from Caltrans facilities; and providing useful information to facilitate Caltrans' stormwater management strategies.

As part of its runoff and characterization monitoring studies, Caltrans identified pollutants that were discharged from Caltrans facilities with a load or concentration that commonly exceeded applicable standards and were still considered treatable by available Treatment BMPs. These pollutantsinclude sediment; metals (i.e., total and dissolved fractions of zinc, lead, and copper); nitrogen (e.g., ammonia); phosphorus; and general metals. Of the chemical impairments and established TMDLs associated with receiving water bodies within the proposed project’s corridor, copper, lead, zinc, and nutrients are treatable by Treatment BMPs.[4] During the construction phase, Temporary Construction Site BMPs would be implemented to treat stormwater and non-stormwater discharges to the Maximum Extent Practicable (MEP); therefore, runoff from the construction area would not likely create any surface water quality impacts. During the operational phase, runoff from the proposed project would be conveyed to Treatment BMPs, would be treated to the MEP, and would not likely create any surface water quality impacts. Treatment BMPs and temporary Construction Site BMPs are considered project design features and are discussed in Section 5.3.

Table 4-13. Impaired Waters

Water Body	Impairment	Total Maximum Daily Load (TMDL)		
		Status	Expected Completion Date	US EPA Approved Date
Chino Creek Reach 1A	Nutrients	Required	2019	
	Pathogens	Being addressed by a USEPA-approved TMDL		5/16/2007
Chino Creek Reach 1B	Chemical Oxygen Demand	Required	2019	
	Nutrients	Required	2019	
	Pathogens	Being addressed by a USEPA-approved TMDL		5/16/2007
Chino Creek Reach 2	Coliform Bacteria	Being addressed by a USEPA-approved TMDL		5/16/2007
	pH	Required	2021	
Cucamonga Creek Reach 1	Cadmium	Required	2021	
	Copper	Required	2021	
	Lead	Required	2021	
	Zinc	Required	2019	

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Table 4-13. Impaired Waters

Water Body	Impairment	Total Maximum Daily Load (TMDL)		
		Status	**Expected Completion Date**	**US EPA Approved Date**
Santa Ana River Reach 3	Copper	Required	2023	
	Lead	Required	2023	
	Fecal Coliform	Being addressed by an EPA-approved TMDL		5/16/2007
San Antonio Creek	pH	Required	2021	
Huntington Beach State Park	Polychlorinated biphenyls	Required	2019	
Notes: pH – alkalinity; TMDL – Total Maximum Daily Load; USEPA – U.S. Environmental Protection Agency.				

Source: State Water Resources Control Board, 2017.

5.0 IMPACTS ANALYSIS

The potential impacts on water quality, along with the implementation of temporary (i.e., construction phase) and project design features are discussed in the following sections.

5.1 Potential Impacts on Water Quality

The proposed project would not physically disturb offsite water bodies, but the site discharge could affect downstream water bodies. Without the implementation of BMPs, construction of the proposed project and an increase in the amount of impervious surfaces associated with either of the build alternatives could affect offsite receiving water bodies. Construction of the project and the increase in runoff could cause or contribute to an alteration in water quality and could affect the beneficial uses of the water bodies. Project construction and operational activities were reviewed for each build alternative. The following discussion addresses each alternative's potential to introduce water pollutants into the environment, with a focus on stormwater runoff.

Potential short-term construction impacts were analyzed by determining the maximum amount of disturbed soil area (DSA) from construction activities for each of the build alternative alignments and stations. The DSA for each of the O&M facility options were separately determined. Overall short-term construction impacts considered both the DSA for the alignments and stations and the range of potential DSA for the O&M facility.

Potential long-term impacts were analyzed by determining the proposed additional amount of impervious surfaces for each of the build alternative alignments and stations, and for the O&M facility options. The levels of impact were evaluated by comparing the proposed total amount of impervious surfaces of the project within the WVC corridor with the Chino Split hydrologic sub-area. No improvements are proposed under the No Build Alternative, so no short-term or long-term impacts on water quality or hydrology are expected.

5.2 Alternative-Specific Impact Analysis

5.2.1 Short Term Construction Impacts Related to Water Quality

Soil-disturbance activities would include earth-moving activities such as excavation necessary to install bus shelters; soil compaction and earth-moving; and grading. The estimated maximum DSA during construction would include the DSAs for the project alignment, for the stations, and for the O&M facility. The DSAs for the Build Alternative A and B alignments and stations would be 3.10 acres and 60.64 acres, respectively. The DSAs for the O&M facility would range from 4.77 acres to 9.60 acres, depending upon the option selected (the analysis assumes that the entire O&M facility site would be disturbed). Thus, the overall DSAs for the alignment, stations, and O&M facility would range from 7.87

acres to 12.70 acres for Build Alternative A and from 65.41 acres to 70.24 acres for Build Alternative B.

Disturbed soils are susceptible to high rates of erosion from wind and rain, resulting in sediment transport via stormwater runoff from the proposed project area. Chemical contaminants, such as oils, fuels, paints, solvents, nutrients, trace metals, and hydrocarbons, can attach to sediment and be transported to downstream drainages and ultimately into collecting waterways, contributing to the chemical degradation of water quality. Anticipated changes associated with sediment transport to receiving water bodies would be a decrease in water clarity, which would cause a decrease in aquatic plant production and obscure sources of food, habitat, refuges, and nesting sites of fish. The deposition of sediment or silt in a water body can fill gravel spaces in stream bottoms, smothering fish eggs and juvenile fish.

Sediment can also carry nutrients, such as nitrogen and phosphorus, which may cause algal blooms. Pesticides that attach to soil particles and enter waterways could bioaccumulate within the food chain, which ultimately could affect the aquatic ecosystems. The transport of other toxic pollutants into receiving water bodies could introduce subtle, sublethal changes in plant and wildlife gene structure, nervous system function, immune response, and reproductive rates, which ultimately affects species survival, population, and ecosystem structure (Department of Water Resources, 2005).

Construction materials, waste handling, and the use of construction equipment could also result in stormwater contamination and affect water quality. Spills or leaks from heavy equipment and machinery can result in oil and grease contamination. Operation of vehicles during construction could also result in tracking of dust and debris. Staging areas can also be sources of pollutants because of the use of paints, solvents, cleaning agents, and metals during construction. Pesticide use, including herbicides, fungicides, and rodenticides, associated with site preparation is another potential source of stormwater contamination. Larger pollutants, such as trash, debris, and organic matter, could also be associated with construction activities. As such, the discharge of stormwater may cause or threaten to cause violations of WQOs. These pollutants would occur in the stormwater discharges and non-stormwater discharges and could cause chemical degradation and aquatic toxicity in the receiving waters.

Excavation could affect groundwater quality during dewatering activities if groundwater is encountered. Bus shelters in areas of shallow groundwater would require excavation and dewatering. If an excavation needs to be dewatered, groundwater would be disposed of according to NPDES dewatering permit requirements. The amount of dewatering, however, is likely to be relatively small and to occur across widely spaced locations; therefore, no substantial changes to regional groundwater levels are anticipated.

Construction activities could result in accidental releases of construction-related hazardous materials that might affect groundwater. Excavations could provide a direct path for construction-related contaminants to reach groundwater. Excavation could disturb known and undocumented soil or groundwater contamination, resulting in the migration of contaminated groundwater further into the groundwater table. The two WVC build alternatives would have similar potentials for inadvertent contamination of groundwater. Per NPDES requirements, a dewatering plan would be prepared to guide the response to undocumented soil or groundwater contamination; therefore, no substantial changes to groundwater quality are anticipated.

During construction, all of the regulatory requirements would be implemented prior to soil disturbance. Additionally, a SWPPP would be prepared that would address stormwater management, spill prevention and response, and non-stormwater discharges. Construction Site BMPs would be deployed to the MEP. Because construction is occurring in an already built environment, construction impacts of the build alternatives would only slightly increase sediment loads during the removal of paved areas and disturbance of underlying soils. Temporary increases in sediment loads from the construction area are unlikely to alter the hydrologic response (i.e., erosion and deposition) downstream in the Chino Split HSA watersheds and, subsequently, the sediment processes in these watersheds because the potential for sediment is negligible. Use of temporary Construction Site BMPs would minimize construction impacts on water quality.

5.2.2 Long-Term Impacts on Water Quality

Table 5-1 lists the net new amount of impervious surfaces within the Chino Split that would result from construction of either of the two build alternatives. Build Alternatives A and B would both result in a very minor increase in the amount of impervious surfaces. For either of the build alternatives, the maximum net new amount of impervious surfaces contributed to the 190,515-acre Chino Split HSA would be less than 1 percent. The proposed project would not increase the amount of impervious surfaces in Los Angeles County.

Table 5-1. Amount of New Impervious Surfaces per Build Alternative (acres)

Area	Impervious Surface Area	
	Alternative A (acres)	**Alternative B (acres)**
Net New Amount of Impervious Surfaces of alignments and stations	0.00	1.81
O&M Facility Site 1	8.56	8.56
O&M Facility Site 2	0.00	0.00
O&M Facility Site 3	0.47	0.47
Total area	0.0 – 8.56	1.81 – 10.37
Chino Split area	190,515	190,515
Proposed Increase (%)	<1	<1

Source: Parsons, 2018.

Potential water pollutants associated with operation of the proposed project are presented below.

BRT Corridor Improvements:

Development of the BRT corridor would include dedicated lanes, queue jump lanes, sidewalk connections, and boarding pads. Where roadway widening is required to accommodate dedicated lanes and queue jump lanes, the project would widen existing roadways. Where corridor improvements such as sidewalk connections and boarding pads are required, the project would construct new impervious surfaces. Build Alternative A would not increase the amounts of impervious surfaces along the alignment or at the stations (Table 5-1). Under Build Alternative B, increases in the amounts of impervious surfaces along the alignment and at the stations would be minor. Pollutants of concern from the new sources of runoff structures include sediment, trash, hydrocarbons, oil, and grease, which could adversely affect water quality through discharges downstream.

Maintenance Facility:

The new maintenance facility proposed to support the project would consist entirely of impervious surfaces, including buildings, walkways, parking areas, and driveways. This would be an increase in impervious surfaces of zero to 8.56 acres, depending upon the site selected (Table 5-2). The facility would be designed to collect storm water runoff and, following detention and treatment, convey it to the existing drainage system. The storm runoff from the site would result in a negligible increase in annual storm runoff from the Chino Split Area.

Table 5-2. Changes in Amount of Impervious Surfaces for O&M Facility

Type of Surface	Area by Site (acres)		
	Site 1	Site 2	Site 3
Existing Impervious Surfaces	1.04	4.77	8.93
Existing Permeable Surfaces	8.56	0.00	0.47
Total	9.60	4.77	9.40
Increase with Project	8.56	0.00	0.47

Buses and cars would be parked on the site, possibly dripping or leaking petroleum products and other fluids onto the pavement and also tracking soil onto the site. Wind-blown dust, vegetation, and trash also could collect on exposed paved surfaces. Pollutants of concern collecting on these surfaces would include sediment, trash, hydrocarbons, oil and grease, and soaps and surfactants.

Regarding potential changes in water quality associated with the maintenance facility, an Industrial SWPPP would be prepared for the site. The facility would be designed such that storm runoff would be collected and treated onsite prior to discharge into storm drains, in accordance with the applicable General Industrial Permit and the SWPPP. Stormwater runoff would be treated by incorporating project design features such as a detention basin or other LID stormwater BMP that would meet the Industrial SWPPP standards and, therefore, not convey contaminants that could affect local water quality into nearby receiving water bodies. All waste fluids generated by cleaning, washing, and light maintenance activities would be collected and treated prior to discharge. Wastewater generated by sinks, toilets, and showers on the site would be discharged to the sanitary sewer system. Thus, this facility would have a negligible impact on surface water quality.

The existing East Valley Vehicle Maintenance Facility (EVVMF) in San Bernardino would provide heavy maintenance and repair services for the new 60-foot articulated compressed natural gas propulsion buses. Maintenance activities for the new bus fleet would be similar to those currently conducted at the San Bernardino facility. No new pollution sources would be created by the proposed project. All BRT vehicle maintenance services would be managed and controlled per the Industrial SWPPP which would identify the necessary water quality controls that would be employed to minimize pollutant discharges associated with vehicle service activities. Water quality controls, along with implementation of the Industrial SWPPP would be ongoing throughout the lifespan of the West Valley operations and maintenance facility, such that there would be minimal impact on existing water quality. Runoff, therefore, would not pose a threat to water quality because all pollutant-generated activities would be managed onsite prior to discharge.

BRT Stations:

The proposed station platforms, including the parking lots, would be in the existing urban areas of Pomona, Montclair, Ontario, Rancho Cucamonga, and Fontana. Few, if any, new potential pollution sources would be constructed, and there would be minimal impact on existing water quality. Activities associated with the stations would be similar to those currently conducted in these urban areas, such as office use, pedestrian uses, and parking. Pollutants of concern associated with the stations and parking lots would include trash, hydrocarbons, oil, grease, and sediment.

During project operation, stormwater runoff from station parking lots and the Omnitrans ROW could degrade water quality. Runoff from the ROW, however, would be directed to project design features. The project design features would include water quality control measures consistent with design criteria identified in the MS4 NPDES permits. No runoff from the WVC Project would be discharged directly to any surface water body. Project design features are described in Section 5.3.

5.2.3 Long-Term Impacts on Hydraulic Capacity

The addition of new impervious surfaces and related increases in stormwater runoff from the BRT corridor improvements, the BRT stations, and the new O&M facility could exceed the capacity of the offsite drainage system, causing or exacerbating flooding, erosion, or sedimentation. Any alteration of the existing drainage pattern could increase the rate or amount of surface runoff. No substantial changes to hydraulic conveyance capacity are anticipated because culverts and other drainage facilities would be designed and constructed to maintain or provide greater hydraulic conveyance capacity.

To account for the 1.81 acres of new impervious surfaces, primarily along Holt Boulevard near Vineyard Avenue in the City of Ontario, the project would include an engineered infiltration area of approximately 4,000 square feet in the vicinity of Plum Avenue (Figure 5-1). With the inclusion of this design feature, the impact of new impervious surfaces along the alignment on hydraulic conveyance capacity would be negligible. The proposed O&M facility is the project element with the largest potential to affect hydraulic conveyance capacity. Construction of the facility on optional sites #1 or #3 would increase the amount of impervious surfaces and thus increase runoff from these sites. The facility would be designed, however, to collect and infiltrate storm runoff on-site. For optional Site #1, a total of 16,654 square feet of infiltration area would be constructed on the eastern and southern borders of the site (Figure 5-2). For optional Site #3, a total of 1,040 square feet of infiltration area would be constructed on the western border of the site (Figure 5-3). With these design features, the impact of the O& facility on hydraulic conveyance capacity would be negligible.

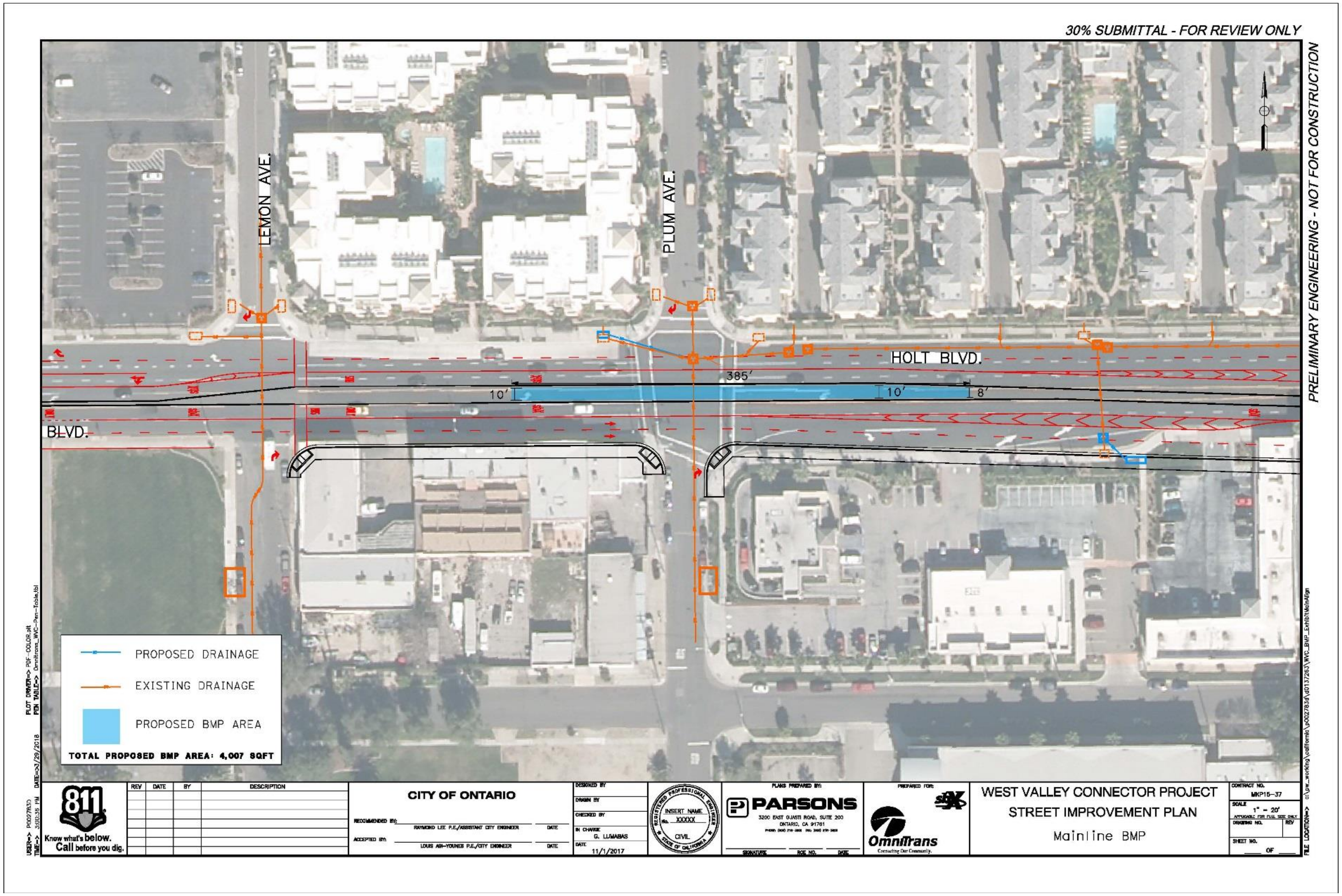

Figure 5-1: Proposed Project Corridor BMP

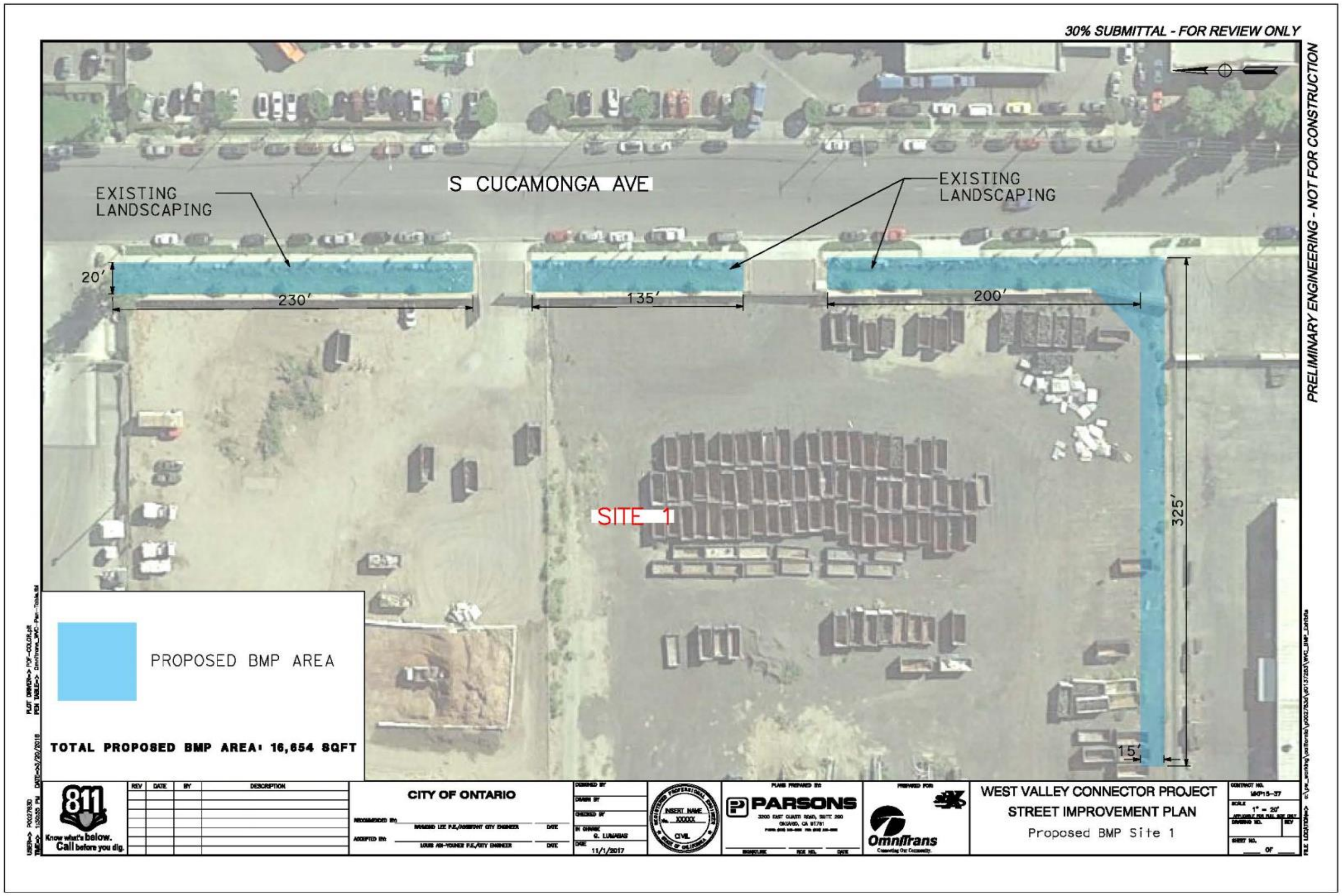

Figure 5-2: Proposed BMP Area for O&M Facility Site 1

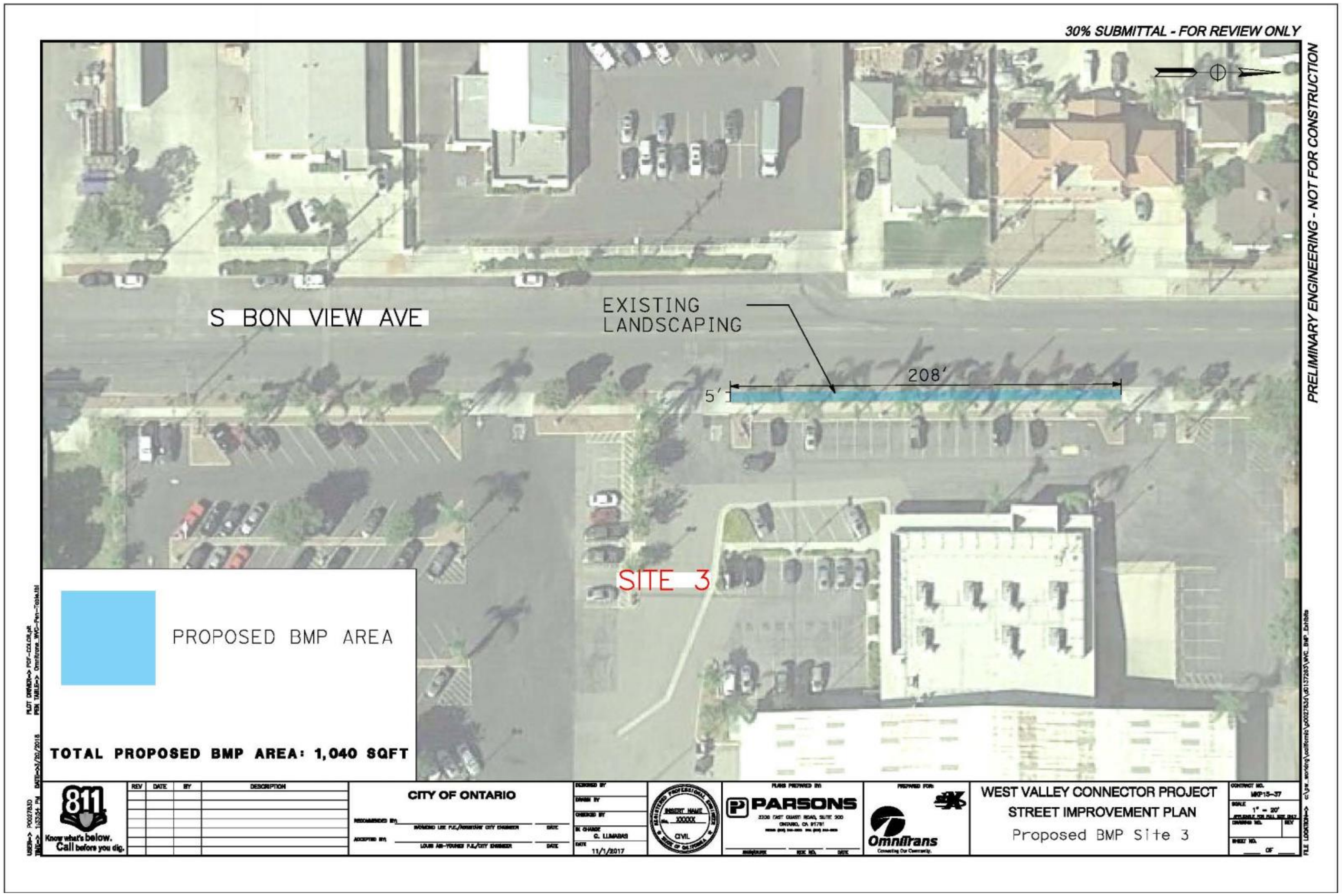

Figure 5-3: Proposed BMP Area for O&M Facility Site 3

A discussion regarding the project design features proposed for the WVC Project is provided in Section 5.3.

5.2.4 Long-Term Impacts on Groundwater Quality

Although the soils within the project limits are classified as HSG A and exhibit high infiltration rates, the WVC Project is being constructed in a built environment. The urban areas where BRT corridor improvements are proposed have a very low potential for groundwater recharge. Therefore, operation of the WVC Project would not cause any substantial long-term changes to groundwater quality or volume.

5.3 Project Design Features

The Los Angeles and San Bernardino MS4 NPDES permits describe how the proposed project would be required to comply with water quality standards. Each NPDES permit includes BMPs intended to reduce the quantity and improve the quality of stormwater discharged to the stormwater system. Project design features for the selected alternative would include Construction, Site Design / Low Impact Development (LID), Source Control, and Treatment Control BMPs. These BMPs would be implemented to improve stormwater quality during construction and operation of the WVC corridor and O&M facility to minimize potential stormwater and non-stormwater impacts on water quality.

Onsite stormwater management facilities would capture runoff from new impervious surfaces associated with the project and provide pre-treatment of runoff prior to its discharge, including station parking areas, dedicated lanes, bus stops, queue-jumping lanes, and O&M parking areas and maintenance facilities. The use of LID techniques to retain runoff onsite and to reduce offsite runoff would be evaluated and used to the extent practicable. The BMPs proposed as project design features are organized into four categories, as shown in Table 5-3.

Table 5-3. Best Management Practices (BMP) Categories

BMP	Description
Construction	Temporary soil stabilization and sediment control, non-stormwater management, and waste management
Site Design / Low-Impact Development	Minimize lane widths, infiltration basins, concentrated flow controls, landscaping
Source Control	Non-structural (litter pickup, street sweeping, permanent soil stabilization, etc.) and structural (slope protection systems, etc.)
Treatment Control BMP	Permanent treatment devices and facilities

Source: San Bernardino County. Transportation Project BMP Guidance..

Potential short-term water quality impacts associated with construction would be minimized by implementing Construction BMPs. Potential long-term water quality impacts associated with operation and maintenance of the transportation facility would be minimized by implementing Site Design / LID, Source Control, and Treatment Control BMPs. Overall, with incorporation of temporary and permanent BMPs, no water quality impacts are expected with implementation of the WVC Project.

5.3.1 Construction BMPs

Construction BMPs would be applied during construction activities to minimize the pollutants in stormwater and non-stormwater discharges. Construction BMPs would provide temporary erosion and sediment control, as well as control of other potential water pollutants. Table 5-4 displays the six categories of Construction BMPs that are suitable for controlling potential pollutants on construction sites. Although specific Construction BMPs have not been identified, the following categories of BMPs would be implemented for the proposed project. Detailed information about the specific Construction BMPs associated with each category can be found in the Stormwater Best Management Practice Handbook (California Stormwater Quality Association, 2003).

Construction BMPs would be evaluated and identified through preparation of a SWPPP. The SWPPP would address all State and federal water quality control requirements and regulations. The SWPPP would address all construction-related activities, equipment, and materials that could affect water quality. The SWPPP would identify BMPs to minimize pollutants, sediment from erosion, stormwater runoff, and other construction-related impacts. In addition, the SWPPP would include a Construction Site Monitoring Program, which requires inspection and sampling and analysis procedures to ensure that the implemented Construction BMPs are effective in minimizing the exceedance of any water quality standard. The Construction BMPs identified in the SWPPP would be consistent; therefore, they would comply with the control practices required under the CGP.

Table 5-4. Construction BMP Categories

Category
Erosion Control
Sediment Control
Wind Erosion Control
Tracking Control
Non-Stormwater Management and Material Management
Waste Management and Materials Pollution Control

Source: California Stormwater Quality Association, 2003.

5.3.2 Operational BMPs

Site Design / Low-Impact Development BMPs

The Site Design / LID BMPs are permanent measures intended to limit increases in storm runoff by minimizing increases in impervious surfaces and capturing and infiltrating runoff at the source. The feasibility of such measures would depend upon (a) their consistency with competing design considerations (e.g., lane widths), (b) available space (e.g., infiltration basins, landscaping), and (c) cost. In the absence of such measures, the project could affect downstream channel erosion processes, leading to increased channel scouring and sediment deposition through changes in peak discharges and runoff volumes. With implementation of Site Design/LID BMPs, runoff from the WVC corridor and support facilities would be attenuated, and the pre-project flow regime would be maintained. Table 5-5 displays Site Design/LID BMPs that would be incorporated, as appropriate, into the design of the proposed project.

The Site Design/LID BMPs identified as applicable to the proposed project are discussed in the following subsections. As additional data become available during subsequent design phases, other Site Design/LID BMPs would be considered.

Table 5-5. Site Design / Low-Impact Development BMPs

Peak-Flow Attenuation Devices	Reduction of Paved Surface
Energy Dissipation Devices	Preservation of Existing Vegetation
Ditches, Berms, Dikes, and Swales	Oversize Drains, Down Drains, Paved Spillways
Flared Culvert End Sections	Outlet Protection
Slope Roughening, Terracing, Rounding/Stepping	

Source: California Stormwater Quality Association, 2003.

Potential increases in storm runoff along the project corridor would be offset by transitions between culvert outlets, headwalls, wingwalls, and channels would be smoothed to minimize turbulence and scour. Offsite runoff would be allowed to pass under or around the proposed project, so the existing drainage pattern would be maintained. Offsite flows would be managed in a manner that would mimic the existing drainage network and not inundate the roadway or the existing drainage system. The proposed project would require evaluation of all drainages that would be affected, including those that are locally owned.

It would be necessary to direct or intercept surface runoff, so the proposed project would modify ditches, dikes, berms, and swales. Erosion and washout would be minimized by erosion control measures such as groundcover or mulch. Velocity dissipation devices, flared end outlets, headwalls, transition structures, and splash walls would be incorporated into the design, where necessary, at culvert inlets and outlets to prevent erosion. Ditches would be modified, and box culverts would be extended to help intercept sheet flow, where necessary, and to convey it to facilities that cross under the roadway.

The project design would consider minimizing the footprint and matching the existing grading as close as possible to preserve as much of the existing vegetation as possible.

Source Control BMPs

Source Control BMPs would include non-structural (litter pickup, street sweeping, permanent soil stabilization, etc.) and structural (slope protection systems, etc.) measures. Based on agency agreements, site maintenance activities such as litter pickup and street sweeping would be conducted at the bus shelters, stations, and parking lots along the WVC corridor and at the O&M facility. Most of these activities would be handled by small crews with a minimal amount of soil disturbance.

The purpose of Source Control BMPs is to reduce the amounts of pollutants in storm water and improve the quality of urban runoff. Source Control BMPs would be ongoing throughout the lifespan of the WVC. The Source Control BMPs employed would be consistent with the specifications and guidelines presented in either existing or potential maintenance staff guides/plans. This guidance would provide detailed instructions on the application of approved Source Control BMPs for BRT activities. Table 5-6 displays typical transportation facility-related maintenance activities, along with some of the Source Control BMPs that would be implemented.

Table 5-6: Source Control Best Management Practices

Maintenance Activity	Source Control BMP
Drainage Ditch and Channel Maintenance	Sediment Control; Material Use; Compaction
Drain and Culvert Maintenance	Scheduling and Planning; Stockpile Management; Sediment Removal
Sweeping Operations	Liquid Waste Management; Safer Alternative Products
Litter and Debris Removal	Anti-Litter Signs; Litter and Debris; Solid Waste Management
Graffiti Removal	Material Use; Safer Alternative Products; Storm Drain Inlet Protection

Treatment Control BMPs

Treatment Control BMPs are permanent measures that improve stormwater quality after construction is complete. Nine types of Treatment Control BMPs would be considered for the proposed project to minimize the long-term potential impacts of Omnitrans facilities or activities. Table 5-7 displays the proposed Treatment Control BMPs.

Table 5-7. Treatment Control BMPs

Biofiltration System	Multi-Chambered Treatment Train
Infiltration Device (Basin or Trench)	Wet Basin
Detention Device	Traction Sand Traps
Dry Weather Flow Diversion	Media Filters
Gross Solid Removal Device	

Source: California Stormwater Quality Association, 2003.

The build alternatives would include project design features such as Treatment Control BMPs to the MEP. Consideration of the CWA 303(d) impairments, along with the existing water quality discussed in Section 3.3, would be used to prioritize potential Treatment Control BMPs.

The proposed project would be built within an existing transportation corridor and the available ROW is limited, so one treatment strategy that would be evaluated would be to infiltrate a percentage of the runoff from the Net New Impervious Surface Area (NNISA) by using Natural Infiltration Areas (NIA) located within the existing Omnitrans ROW. NIAs maximize infiltration of runoff without the need to construct a traditional Treatment Control BMP (i.e., media filter, infiltration basin, detention basin). A detailed soils study would be required to determine if the soils within the proposed project limits are adequate for infiltration and to verify that NIAs are a viable strategy.

If the NIA strategy is incapable of infiltrating 90 percent of the NNISA, then other Treatment Control BMPs would be evaluated for implementation to the MEP. Table 5-6 identifies nine Treatment BMPs that have been used for transportation facilities. Based on the existing condition of the proposed project corridor and the limited ROW, BMPs that use biofiltration or bioretention techniques are recommended for the WVC Project to minimize the long-term potential impacts associated with the NNISA. Table 5-8 briefly describes these recommended BMPs, and Table 5-9 summarizes information pertaining to the Treatment Control BMPs that are not recommended for use on the WVC Project.

Table 5-8. Recommended Treatment Control BMPs

Treatment Technique	BMP Description
Biofiltration	Reduces stormwater pollutant discharges by intercepting rainfall on vegetative canopy, and through incidental infiltration or evapotranspiration and filtration. Incidental infiltration is an important factor in achieving the required pollutant load reduction.
Bioretention	Reduces stormwater pollutant discharges by intercepting rainfall on vegetative canopy and through evapotranspiration and infiltration. The bioretention system typically includes a minimum 2-foot top layer of a specified soil and compost mixture underlain by a gravel-filled temporary storage pit dug into the in-situ soil.
Bioswale	Consists of a shallow channel lined with grass or other dense, low-growing vegetation. Bioswales are designed to collect stormwater runoff and to achieve a uniform sheet flow through the dense vegetation for a period of several minutes.

Source: Los Angeles RWQCB, 2012.

Table 5-9. Treatment Control BMPs Eliminated from Consideration

BMP	Reason not Applicable to Proposed Project
Wet Basins	There is no consistent source of water within the proposed project limits to maintain the permanent pool of water required for these devices.
Traction Sand Traps	Traction sand is not applied at least twice per year within the proposed project limits.
Dry Weather Flow Diversion Devices	Dry weather flows generated by Omnitrans facilities are not anticipated within the proposed project area.
Gross Solids Removal Devices	None of the offsite receiving water bodies are listed as impaired for Trash, and Trash TMDLs have not been established.
Multi-Chamber Treatment Trains	These BMPs are recommended for vehicle service facilities, parking areas, paved storage areas, and fueling stations. There is insufficient area to accommodate this BMP at the station parking areas. This BMP, however, may be considered for the operations and maintenance facility based on further evaluation during subsequent design phases.
Media Filters	There is insufficient area to accommodate this BMP within Omnitrans' ROW. This BMP, however, may be considered for parking lots and for the operations and maintenance facility, based on further evaluation during subsequent design phases.

Infiltration Basin	Insufficient area within Omnitrans ROW for an infiltration basin. Opportunities for NIAs and an Infiltration Trench may exist.
Detention Basins	Insufficient area within Omnitrans ROW.

6.0 CONCLUSIONS, RECOMMENDATIONS, AND MITIGATION MEASURES

6.1 Conclusions

The proposed project consists of a 35-mile-long corridor with dedicated lanes, queue jump lanes, bus shelters, bus stations, parking lots, and a maintenance facility. The affected environment is built out and has been substantially altered by human activity; it no longer functions as a natural hydrologic system. The disturbed soil areas (DSA) from construction activities for Build Alternatives A and B alignments and stations are estimated at 3.10 acres and 60.64 acres, respectively. The proposed operations and maintenance (O&M) facility would add another 9.60, 4.77, or 9.40 acres of disturbed soil areas (DSA)s depending on the site selected.

Construction of the Build Alternative A alignment and stations would not increase the amount of impervious surfaces, while construction of the Build Alternative B alignment and stations would increase the amount of impervious surfaces in the Chino Split Area by 1.81 acres. The proposed O&M facility would increase the amount of impervious surfaces by 0.00, 0.47, or 8.56 acres depending on the site selected.

For areas where improvements are required, impervious surfaces are already common because of past land development. The project could result in, at most, a small absolute increase in impervious surface (see Section 5.2.1). Stormwater runoff from the project during construction and operation could contribute water pollutants of concern to the stormwater conveyance system. During construction and operation, San Bernardino County Transportation Authority (SBCTA) would ensure that the permit requirements and project design features are implemented to minimize or prevent water quality impacts. Consequently, because the combination of Best Management Practices (BMPs) and project design features incorporated in response to regulatory requirements effectively eliminate water quality impacts, no mitigation measures are necessary. These permit requirements and project design features are considered part of the project and are discussed in greater detail below.

To minimize temporary water quality impacts, per the Construction General Permit (CGP), SBCTA would be required to file an Notice of Intent (NOI) for coverage under the CGP. The project would then be required to prepare and implement a Stormwater Pollution Prevention Plant (SWPPP). The SWPPP would identify BMPs to minimize potential short-term increases in sediment transport caused by construction, control erosion, manage stormwater, and control pollutants associated with construction materials brought onto the site by the contractor. The SWPPP would also include a Construction Site Monitoring Program that would be based on the project's risk level to ensure that the implemented

BMPs are effective and prevent any discharge that would result in exceeding any water quality standard.

Dewatering is expected to be limited and, if required, would fully conform to the requirements specified in the National Pollutant Discharge Elimination System (NPDES) permit for discharges to surface water that pose an insignificant (de minimis) threat to water quality, from either the Santa Ana or Los Angeles Regional Water Quality Control Boards.

To minimize permanent water quality impacts, an evaluation of the stormwater drainage system's capacity to accommodate project runoff would be evaluated during the detailed design phase. As necessary, onsite stormwater management measures, such as Site Design and Treatment Control BMPs, would be designed to capture runoff and provide treatment prior to discharge from pollutant-generating surfaces, including parking lots, bus stations, dedicated lanes, and queue jump lanes. The municipal separate storm sewer (MS4) NPDES permits for Los Angeles County and San Bernardino County identify requirements for Site Design and Treatment Control BMPs to control pollutants, pollutant loads, and runoff volume emanating for project sites. BMPs are considered project design features. These project design features would manage runoff to minimize any significant effects on adjacent impervious surfaces and to the stormwater conveyance system, thereby protecting downstream water bodies.

Any change in the amount of impervious surfaces or vehicle service activities at the existing East Valley Vehicle Maintenance facility in San Bernardino would trigger SBCTA to modify its existing NOI under the facility waste discharge identification number 836I000550. Consequently, the facility SWPPP and monitoring plan would also be modified to identify and control all pollutant-generating activities. Runoff would not pose a threat to water quality because all pollutant-generated activities would be managed onsite prior to discharge. Therefore, activities associated with the maintenance facility would comply with all Industrial General Permit conditions.

Increased pollutants in stormwater from Bus Rapid Transit corridor improvements that do not have adequate stormwater facilities could degrade water quality. With implementation of project design features and adherence to water quality regulations, however, the effects during construction on drainage and stormwater runoff patterns, as well as groundwater quality, would be minimized. The proposed project would not have a significant effect on the water quality of local channels and creeks. Similarly, effects on surface water quality from operation of the WVC Project would be negligible with implementation of project design features and adherence to water quality regulations.

6.2 Recommendations

It is recommended that the WVC Project use Low-Impact Development (LID) BMPs to retain runoff onsite and reduce offsite runoff and that these techniques be incorporated to the extent practical. Such techniques, considered project design features, include vegetated swales, grass strips, organic mulch layers, bioretention areas, natural infiltration areas, and planting soil beds. Other LID principles recommended for implementation include:

- Conserve and use natural (i.e., earthen) areas near existing and proposed bus stops and shelters;
- Divert roof runoff from bus shelters or any buildings proposed at the maintenance facility to drain to vegetated areas before discharge;
- Direct surface flow from parking areas to vegetated areas before discharge;
- Use permeable pavement in parking lots;
- Design parking lots to drain to landscaped areas to provide treatment, retention, or infiltration, where feasible; and
- Design parking lots with no stop blocks to allow stormwater to drain into landscaped areas.

It is recommended that a copy of this Water Quality Report be submitted to public works department officials in each of the jurisdictions within the proposed project corridor. Each public works department official should then be contacted and interviewed during the next design phase to acquire up-to-date information on jurisdiction-specific requirements for complying with their NPDES permit and information on how to obtain approval for any proposed connection to the jurisdiction’s storm drain system.

It is also recommended that SBCTA establish an agreement with the appropriate city to identify maintenance responsibilities for any of the shared stations or parking lots. The agreement should identify the city that would be responsible for maintenance or if maintenance would be a shared responsibility. Once an agreement is established, a Maintenance Plan should be drafted to provide information and guidance on inspection and maintenance procedures for parking areas, landscape areas, and trash receptacles.

6.3 Mitigation Measures

Any proposed mitigation measures would incorporate contingency measures to protect water quality and downstream receiving waters by tracking BMPs and project design features during final design and construction.

During operation, SBCTA would ensure that the permit requirements and project design features are implemented to minimize or prevent water quality impacts. Consequently, because the combination of construction site and maintenance BMPs and project design features incorporated in response to regulatory requirements would effectively minimize water quality impacts, no additional mitigation measures are required.

WQ-1: All construction of the side-running stations under both Alternatives A and B shall be undertaken within the existing impervious areas along the proposed corridor, resulting in no additional impervious areas.

WQ-2: Additional stormwater runoff from the new impervious area along the 3.5-mile dedicated lane segment under Alternative B shall be treated at the infiltration basin to be constructed as part of the proposed Alternative B project.

WQ-3: Additional stormwater runoff from the new impervious area created by the proposed O&M facility under either Build Alternative shall be treated at the on-site infiltration basins to be constructed as part of the proposed project. O&M Site 3 does not have onsite stormwater facilities; therefore, it will be required to contain, retain, and treat its stormwater subject to current NPDES regulations.

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APPENDIX A: 2011 SARWQCB BIOASSESSMENT

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Appendix C1. Water chemistry data from IIRMES (including field and lab analyses). "DUP" denotes a field replicate; red values indicate a "Not Detectable" reading, and blue values indicate a"Detectable, but Not Quantifiable" reading. Dissolved oxygen, pH, water temperature, and specific conductance were measured in the field while the rest of the analytes were measured in the lab.

Site	Lab Replicate	Field Replicate	Dissolved O2 (mg/L)	Field pH	Water Temp. (°C)	Conductivity (µS/cm)	Alkalinity (T)	Ammonia-N (mg/L)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Dissolved Orthophosphate (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)
Reporting Limits						1	5	0.03	0.05	0.05	0.01	5	2
802SWC020	1	1	12.06	6.93	9.9	700	28.6	0.05	0.03	0.08	0.02	4.8	-88
801NLC105	1	1	10.61	7.93	13.66	393	146.9	-88	0.3	0.02	-88	13.8	3.9
802SJR116	1	1	8.84	7.62	20.53	2011	299.9	-88	0.23	-88	0.28	10	6.3
801RB8197	1	1	20.65	9.45	31.18	453	44.9	0.4	0.03	-88	0.15	30	3.9
801RB8254	1	1	15.48	6.55	14.61	170	91.8	-88	0.04	-88	-88	7.5	5.2
801RB8254 DUP	1	2	15.48	6.55	14.61	170	89.8	-88	0.04	-88	-88	2.6	2.9
801RB8312	1	1	8.84	8.06	21.68	1034	191.8	-88	11.26	-88	2.09	58.4	6.9
801RB8339	1	1	16.97	7.28	23.1	1188	222.4	-88	0.33	-88	0.44	5.3	4.4
801RB8404	1	1	7.1	9.83	34.78	279	80	0.05	0.25	0.02	0.09	9	-88
801RB8418	1	1	9.3	8.43	25.12	978	167.3	0.19	7.84	0.42	0.02	6.5	1.1
801RB8439	1	1	8.12	8.07	26.14	1171	134	0.2	0.82	0.21	0.1	11.2	11.3
802SJC453	1	1	9.56	7.57	29.05	279	108.1	0.1	10.19	0.39	0.1	-88	-88
801RB8467	1	1	9.95	6.89	19.65	117	204	-88	0.87	-88	0.4	2	3.3
801RB8483	1	1	9.25	6.92	15.33	699	224	-88	2.04	0.17	0.08	2.8	1.6
801RB8494	1	1	6.72	7.59	28.76	1012	200	0.03	6.87	0.01	1.8	62	1.8
801RB8501	1	1	13.05	5.1	16.24	184	80	-88	0.18	-88	-88	1.4	-88
801RB8511	1	1	7.36	7.07	21.38	788	230	-88	0.62	0.16	0.13	1.6	1
801RB8512	1	1	16.82	5.34	14.41	177	83.6	-88	0.08	-88	-88	-88	2.1
801RB8512 DUP	1	2	16.82	5.34	14.41	177	87.7	-88	0.09	-88	-88	2	2.7
801RB8521	1	1	8.95	10.2	29.26	1000	58	0.25	0.3	0.1	0.23	15.2	23.5
801SAR528	1	1	7.87	7.39	23.28	864	175.4	-88	2.87	0.12	0.54	162.8	2.5
801RB8533	1	1	13.46	6.34	15.23	255	112	-88	0.31	0.06	0.25	2.2	1.7
801RB8549	1	1	11.94	7.61	23.65	2603	246	-88	2.79	0.13	-88	4	1.2
801RB8558	1	1	13.54	8.34	23.45	1175	132	0.11	0.8	-88	0.12	20.4	20.3
801RB8566	1	1	22.2	10.13	29.28	604	124	0.3	0.76	0.04	0.16	13.1	2.3
801RB8566 DUP	1	2	22.2	10.13	29.28	604	126	0.32	0.73	0.04	0.14	12.4	2.2
801RB8575	1	1	97.1	5.07	17.4	220	100	-88	0.3	0.06	0.16	1.8	2.4
801RB8590	1	1	28.47	6.24	8.54	96	46.9	-88	-88	-88	-88	6.7	3.6
801RB8593	1	1	12.77	6.67	19.49	342	302	-88	3.62	0.46	-88	29.8	4.7
801RB8594	1	1	7.1	7.14	24.8	528	210	-88	7.02	0.02	1.46	209.4	2.6
801RB8607	1	1	16.2	7.8	10.21	117	51	-88	-88	-88	-88	9.5	3
801RB8618	1	1	10.34	5.69	12.99	420	216.2	-88	0.02	-88	0.01	14.4	7.4
801RB8622	1	1	9.61	6.97	14.41	2021	456	-88	0.96	0.12	0.08	3.6	-88
801RB8629	1	1	10.56	7.62	18.09	728	230.5	-88	0.84	-88	0.76	12.8	7.7
845RB8633	1	1	13.29	9.97	34.37	1346	34.7	0.22	1.51	0.05	0.01	38.2	12.8

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APPENDIX B: SAN BERNARDINO COUNTY WATER QUALITY

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San Bernardino County Areawide Stormwater Program

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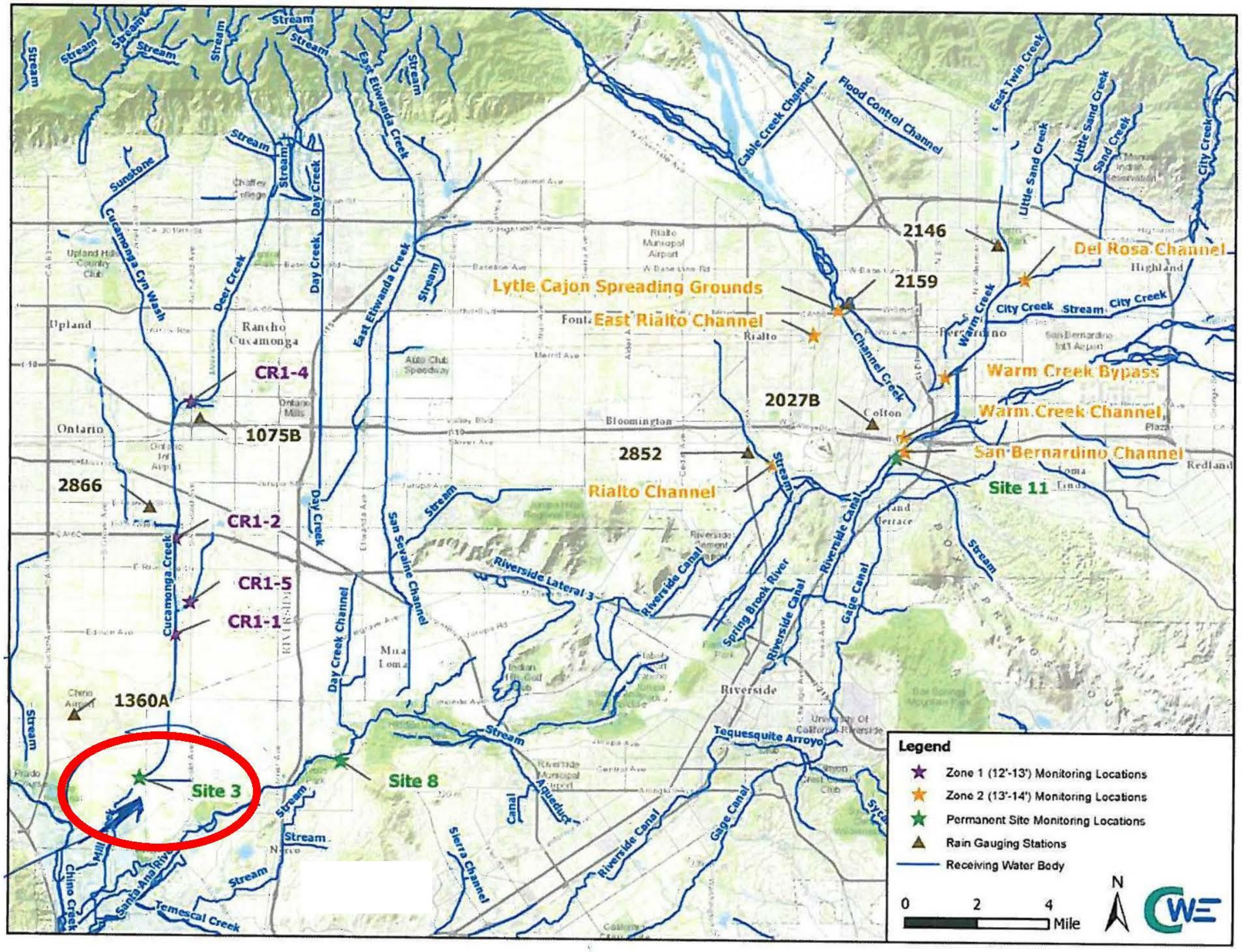

Figure 4.3.1 San Bernardino MS4 Permit Stormwater Monitoring Sites

Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO
Cations						
Total Hardness	mg/L	130	190	83	**660**	350
Calcium	mg/L	43	52	25	200	--
Magnesium	mg/L	4.4	14	4.9	40	--
Sodium	mg/L	56	84	21	11	110
Potassium	mg/L	8.4	9.9	6.8	18	--
Anions						
Chloride	mg/L	55	110	20	11	140
Sulfate	mg/L	38	59	9.4	9.1	150
Nitrate as N	mg/L	0.17	5.1	1.4	1.5	10
Fluoride	mg/L	0.4	0.4	0.4	0.3	0.8
Solids						
TDS	mg/L	280	470	120	74	700
TSS	mg/L	**93**	**78**	**160**	**2,500**	30
Aggregated Organic Compounds						
BOD	mg/L	22	ND	11 J	ND	--
COD	mg/L	**94**	**95**	**110**	**310**	30
TOC	mg/L	17	13	11	10	--
O&G (HEM)	mg/L	4.4 J	1.3 J	1.8 J	-	--
TPH	mg/L	0.5 J	ND	ND	-	--
Surfactants						
MBAS	mg/L	0.13	0.1	0.21 J	ND	--
General Inorganics						
Cyanide	mg/L	ND	ND	ND	ND	--
Nutrients						
Nitrite as N	mg/L	0.04 J	0.14	0.06	0.05 J	--
Ammonia-Nitrogen	mg/L	0.19	0.13	0.6	0.53	--
Kjeldahl Nitrogen	mg/L	3.8	4.1	2.4	5.1	--
Total Inorganic Nitrogen, calc	mg/L	0.40	5.4	2.1	2.1	10
P - Ortho	mg/L	0.021 J	0.006 J	0.18	0.26	
P -Total Diss.	mg/L	0.12	ND	0.19	0.35	--
P -Total	mg/L	**0.4**	**0.63**	**0.5**	**4.2**	0.1

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Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO
Metals and Metalloids (Total)						
Antimony	µg/L	-	-	1.5 J	-	--
Arsenic	µg/L	-	-	1.7 J	-	--
Beryllium	µg/L	-	-	ND	-	--
Cadmium	µg/L	-	-	ND	-	--
Total Chromium	µg/L	-	-	6.2 J	-	--
Chromium 6+	µg/L	-	-	0.37 J	-	--
Copper	µg/L	18	4.9 J	27	64	--
Lead	µg/L	1.7	0.38 J	7.5 J	27	--
Mercury	µg/L	-	-	ND	-	--
Nickel	µg/L	-	-	6.5 J	-	--
Selenium	µg/L	-	-	ND	-	--
Silver	µg/L	-	-	1.4 J	-	--
Thallium	µg/L	-	-	ND	-	--
Zinc	µg/L	46	20 J	170 J	460	--
Metals and Metalloids (Dissolved)						
Arsenic	µg/L	-	-	1.2	-	150
Cadmium	µg/L	-	-	ND	-	1.9/9.0
Copper	µg/L	**11 J**	3.5 J	7.1 J	2.6 J	7.6/44.9
Lead	µg/L	ND	ND	0.2 J	0.37 J	2.1/18.1
Nickel	µg/L	-	-	1.9 J	-	--
Selenium	µg/L	-	-	ND	-	5
Silver	µg/L	-	-	ND	-	2.5/88.6
Zinc	µg/L	10	10	0.25	66	100.9/584.5
Organochlorine Pesticides and PCBs						
4,4'-DDD	µg/L	-	-	ND	-	--
4,4'-DDE	µg/L	-	-	ND	-	--
4,4'-DDT	µg/L	-	-	ND	-	--
a-BHC	µg/L	-	-	ND	-	--
Aldrin	µg/L	-	-	ND	-	--
Aroclor 1016	µg/L	-	-	ND	-	--
Aroclor 1221	µg/L	-	-	ND	-	--

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Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO
Aroclor 1232	µg/L	-	-	ND	-	--
Aroclor 1242	µg/L	-	-	ND	-	--
Aroclor 1248	µg/L	-	-	ND	-	--
Aroclor 1254	µg/L	-	-	ND	-	--
Aroclor 1260	µg/L	-	-	ND	-	--
b-BHC	µg/L	-	-	ND	-	--
Chlordane	µg/L	-	-	ND	-	--
d-BHC	µg/L	-	-	ND	-	--
Dieldrin	µg/L	-	-	ND	-	--
Endosulfan I	µg/L	-	-	0.034 J	-	--
Endosulfan II	µg/L	-	-	ND	-	--
Endosulfan Sulfate	µg/L	-	-	ND	-	--
Endrin	µg/L	-	-	ND	-	--
Endrin Aldehyde	µg/L	-	-	ND	-	--
Heptachlor	µg/L	-	-	ND	-	--
Heptachlor Epoxide	µg/L	-	-	ND	-	--
Lindane	µg/L	-	-	ND	-	--
Methoxychlor	µg/L	-	-	ND	-	--
Toxaphene	µg/L	-	-	ND	-	--
VOCs						
1,1,1-Trichloroethane	µg/L	-	-	ND	-	--
1,1,2,2-Tetrachloroethane	µg/L	-	-	ND	-	--
1,1,2-Trichloroethane	µg/L	-	-	ND	-	--
1,1-Dichloroethane	µg/L	-	-	ND	-	--
1,1-Dichloroethene	µg/L	-	-	ND	-	--
1,2-Dichlorobenzene	µg/L	-	-	ND	-	--
1,2-Dichloroethane	µg/L	-	-	ND	-	--
1,2-Dichloropropane	µg/L	-	-	ND	-	--
1,3-Dichlorobenzene	µg/L	-	-	ND	-	--
1,4-Dichlorobenzene	µg/L	-	-	ND	-	--
2-Chloroethylvinyl Ether	µg/L	-	-	ND	-	--
Acrolein	µg/L	-	-	ND	-	--

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Table 4-8 Monitoring Results Site 3						
Constituents	**Units**	**DWE1**	**DWE2**	**WWE1**	**WWE2**	**WQO**
Acrylonitrile	µg/L	-	-	ND	-	--
Benzene	µg/L	-	-	ND	-	--
Bromodichloromethane	µg/L	-	-	1.7	-	--
Bromoform	µg/L	-	-	ND	-	--
Bromomethane	µg/L	-	-	ND	-	--
Carbon Tetrachloride	µg/L	-	-	ND	-	--
Chlorobenzene	µg/L	-	-	ND	-	--
Chloroethane	µg/L	-	-	ND	-	--
Chloroform	µg/L	-	-	3.8	-	--
Chloromethane	µg/L	-	-	ND	-	--
cis-1,3-Dichloropropene	µg/L	-	-	ND	-	--
Dibromochloromethane	µg/L	-	-	0.52	-	--
Dichlorodifluoromethane	µg/L	-	-	ND	-	--
Ethylbenzene	µg/L	-	-	ND	-	--
Methyl tert Butyl Ether	µg/L	-	-	ND	-	--
Methylene Chloride	µg/L	-	-	ND	-	--
Tetrachloroethene	µg/L	-	-	ND	-	--
Toluene	µg/L	-	-	ND	-	--
trans-1,2-Dichloroethene	µg/L	-	-	ND	-	--
trans-1,3-Dichloropropene	µg/L	-	-	ND	-	--
Trichloroethene	µg/L	-	-	ND	-	--
Trichlorofluoromethane	µg/L	-	-	ND	-	--
Vinyl Chloride	µg/L	-	-	ND	-	--
Xylenes (m+p)	µg/L	-	-	ND	-	--
Xylenes (ortho)	µg/L	-	-	ND	-	--
Semivolatile Organic Compounds						
1,2,4-Trichlorobenzene	µg/L	-	-	ND	-	--
1,2-Diphenylhydrazine	µg/L	-	-	ND	-	--
2,4,6-Trichlorophenol	µg/L	-	-	ND	-	--
2,4-Dichlorophenol	µg/L	-	-	ND	-	--
2,4-Dimethylphenol	µg/L	-	-	ND	-	--
2,4-Dinitrophenol	µg/L	-	-	ND	-	--

Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO
2,4-Dinitrotoluene	µg/L	-	-	ND	-	--
2,6-Dinitrotoluene	µg/L	-	-	ND	-	--
2-Chloronaphthalene	µg/L	-	-	ND	-	--
2-Chlorophenol	µg/L	-	-	ND	-	--
2-Methyl-4,6-Dinitrophenol	µg/L	-	-	ND	-	--
2-Nitrophenol	µg/L	-	-	ND	-	--
3,3'-Dichlorobenzidine	µg/L	-	-	ND	-	--
4,4'-DDD	µg/L	-	-	ND	-	--
4,4'-DDE	µg/L	-	-	ND	-	--
4,4'-DDT	µg/L	-	-	ND	-	--
4-Bromophenyl phenyl ether	µg/L	-	-	ND	-	--
4-Chloro-3-methylphenol	µg/L	-	-	ND	-	--
4-Chlorophenyl phenyl ether	µg/L	-	-	ND	-	--
4-Nitrophenol	µg/L	-	-	ND	-	--
a-BHC	µg/L	-	-	ND	-	--
Acenaphthene	µg/L	-	-	ND	-	--
Acenaphthylene	µg/L	-	-	ND	-	--
Aldrin	µg/L	-	-	ND	-	--
Anthracene	µg/L	-	-	ND	-	--
Aroclor 1016 (screen)	µg/L	-	-	ND	-	--
Aroclor 1221 (screen)	µg/L	-	-	ND	-	--
Aroclor 1232 (screen)	µg/L	-	-	ND	-	--
Aroclor 1242 (screen)	µg/L	-	-	ND	-	--
Aroclor 1248 (screen)	µg/L	-	-	ND	-	--
Aroclor 1254 (screen)	µg/L	-	-	ND	-	--
Aroclor 1260 (screen)	µg/L	-	-	ND	-	--
b-BHC	µg/L	-	-	ND	-	--
Benzidine	µg/L	-	-	ND	-	--
Benzo(a)anthracene	µg/L	-	-	ND	-	--
Benzo(a)pyrene	µg/L	-	-	ND	-	--
Benzo(b)fluoranthene	µg/L	-	-	ND	-	--
Benzo(ghi)perylene	µg/L	-	-	ND	-	--

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Table 4-8 Monitoring Results Site 3						
Constituents	**Units**	**DWE1**	**DWE2**	**WWE1**	**WWE2**	**WQO**
Benzo(k)fluoranthene	µg/L	-	-	ND	-	--
Bis(2-chloroethoxy)methane	µg/L	-	-	ND	-	--
Bis(2-Chloroethyl)ether	µg/L	-	-	ND	-	--
Bis(2-chloroisopropyl)Ether	µg/L	-	-	ND	-	--
Bis(2-ethylhexyl)phthalate	µg/L	-	-	ND	-	--
Butyl benzyl phthalate	µg/L	-	-	4.5 J	-	--
Chlordane (screen)	µg/L	-	-	ND	-	--
Chrysene	µg/L	-	-	ND	-	--
d-BHC	µg/L	-	-	ND	-	--
Di-n-butylphthalate	µg/L	-	-	ND	-	--
Di-n-octylphthalate	µg/L	-	-	ND	-	--
Dibenzo(a,h)anthracene	µg/L	-	-	ND	-	--
Dieldrin	µg/L	-	-	ND	-	--
Diethyl phthalate	µg/L	-	-	ND	-	--
Dimethyl phthalate	µg/L	-	-	ND	-	--
Endosulfan I	µg/L	-	-	ND	-	--
Endosulfan II	µg/L	-	-	ND	-	--
Endosulfan Sulfate	µg/L	-	-	ND	-	--
Endrin	µg/L	-	-	ND	-	--
Fluoranthene	µg/L	-	-	ND	-	--
Fluorene	µg/L	-	-	ND	-	--
Heptachlor	µg/L	-	-	ND	-	--
Heptachlor Epoxide	µg/L	-	-	ND	-	--
Hexachlorobenzene	µg/L	-	-	ND	-	--
Hexachlorobutadiene	µg/L	-	-	ND	-	--
Hexachlorocyclopentadiene	µg/L	-	-	ND	-	--
Hexachloroethane	µg/L	-	-	ND	-	--
Indeno(1,2,3-cd)pyrene	µg/L	-	-	ND	-	--
Isophorone	µg/L	-	-	ND	-	--
n-Nitrosodi-n-propylamine	µg/L	-	-	ND	-	--
N-Nitrosodimethylamine	µg/L	-	-	ND	-	--
N-Nitrosodiphenylamine	µg/L	-	-	ND	-	--

Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO
Naphthalene	µg/L	-	-	ND	-	--
Nitrobenzene	µg/L	-	-	ND	-	--
Pentachlorophenol	µg/L	-	-	ND	-	--
Phenanthrene	µg/L	-	-	ND	-	--
Phenol	µg/L	-	-	ND	-	--
Pyrene	µg/L	-	-	ND	-	--
Toxaphene (screen)	µg/L	-	-	ND	-	--
y-BHC	µg/L	-	-	ND	-	--
Organo-Phosphorus Pesticides						
Aspon	µg/L	ND	ND	ND	ND	--
Atrazine	µg/L	ND	ND	ND	ND	--
Azinphos-ethyl	µg/L	ND	ND	ND	ND	--
Azinphos-methyl	µg/L	ND	ND	ND	ND	--
Bolstar	µg/L	ND	ND	ND	ND	--
Carbophenothion	µg/L	ND	ND	ND	ND	--
Chlorfenvinphos	µg/L	ND	ND	ND	ND	--
Chlorpyrifos	µg/L	ND	ND	ND	ND	--
Chlorpyrifos Methyl	µg/L	ND	ND	ND	ND	--
Coumaphos	µg/L	ND	ND	ND	ND	--
Crotoxyphos	µg/L	ND	ND	ND	ND	--
Demeton-O	µg/L	ND	ND	ND	ND	--
Demeton-S	µg/L	ND	ND	ND	ND	--
Diazinon	µg/L	ND	ND	ND	ND	--
Dichlofenthion	µg/L	ND	ND	ND	ND	--
Dichlorvos	µg/L	ND	ND	ND	ND	--
Dichrotophos	µg/L	ND	ND	ND	ND	--
Dimethoate	µg/L	ND	ND	ND	ND	--
Dioxathion	µg/L	ND	ND	ND	ND	--
Disulfoton	µg/L	ND	ND	ND	ND	--
EPN	µg/L	ND	ND	ND	ND	--
Ethion	µg/L	ND	ND	ND	ND	--
Ethoprop	µg/L	ND	ND	ND	ND	--

Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO
Ethyl Parathion	µg/L	ND	ND	ND	ND	--
Famphur	µg/L	ND	ND	ND	ND	--
Fenitrothion	µg/L	ND	ND	ND	ND	--
Fensulfothion	µg/L	ND	ND	ND	ND	--
Fenthion	µg/L	ND	ND	ND	ND	--
Fonophos	µg/L	ND	ND	ND	ND	--
Leptophos	µg/L	ND	ND	ND	ND	--
Malathion	µg/L	ND	ND	ND	ND	--
Merphos	µg/L	ND	ND	ND	ND	--
Methyl Parathion	µg/L	ND	ND	ND	ND	--
Mevinphos	µg/L	ND	ND	ND	ND	--
Monocrotophos	µg/L	ND	ND	ND	ND	--
Naled	µg/L	ND	ND	ND	ND	--
Phorate	µg/L	ND	ND	ND	ND	--
Phosphamidon	µg/L	ND	ND	ND	ND	--
Phosmet	µg/L	ND	ND	ND	ND	--
Ronnel	µg/L	ND	ND	ND	ND	--
Simazine	µg/L	ND	ND	ND	ND	--
Stirofos	µg/L	ND	ND	ND	ND	--
Sulfotepp	µg/L	ND	ND	ND	ND	--
TEPP	µg/L	ND	ND	ND	ND	--
Terbufos	µg/L	ND	ND	ND	ND	--
Thionazin	µg/L	ND	ND	ND	ND	--
Tokuthion	µg/L	ND	ND	ND	ND	--
Trichlorfon	µg/L	ND	ND	ND	ND	--
Trichloronate	µg/L	-	-	ND	-	--
Bacteria						
E. Coli	MPN/100ml	ND	**1700**	**2200**	**30000**	113
Total Coliform	MPN/100ml	-	-	**160000**	**160000**	100
Fecal Coliform	MPN/100ml	-	-	**22000**	**30000**	400
Fecal Streptococcus	MPN/100ml	8000	1400	17000	90000	--
Enterococcus	MPN/100ml	2200	1100	17000	50000	--

San Bernardino County Areawide Stormwater Program

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Table 4-8 Monitoring Results Site 3

Constituents	Units	DWE1	DWE2	WWE1	WWE2	WQO

NOTES:
DWE - Dry-Weather Event, WWE - Wet-Weather Event, NS - Not Sampled, ND - Non-Detect, - : Not Analized, **Bold** = Result above WQO

APPENDIX C: SAN BERNARDINO COUNTY MONITORING

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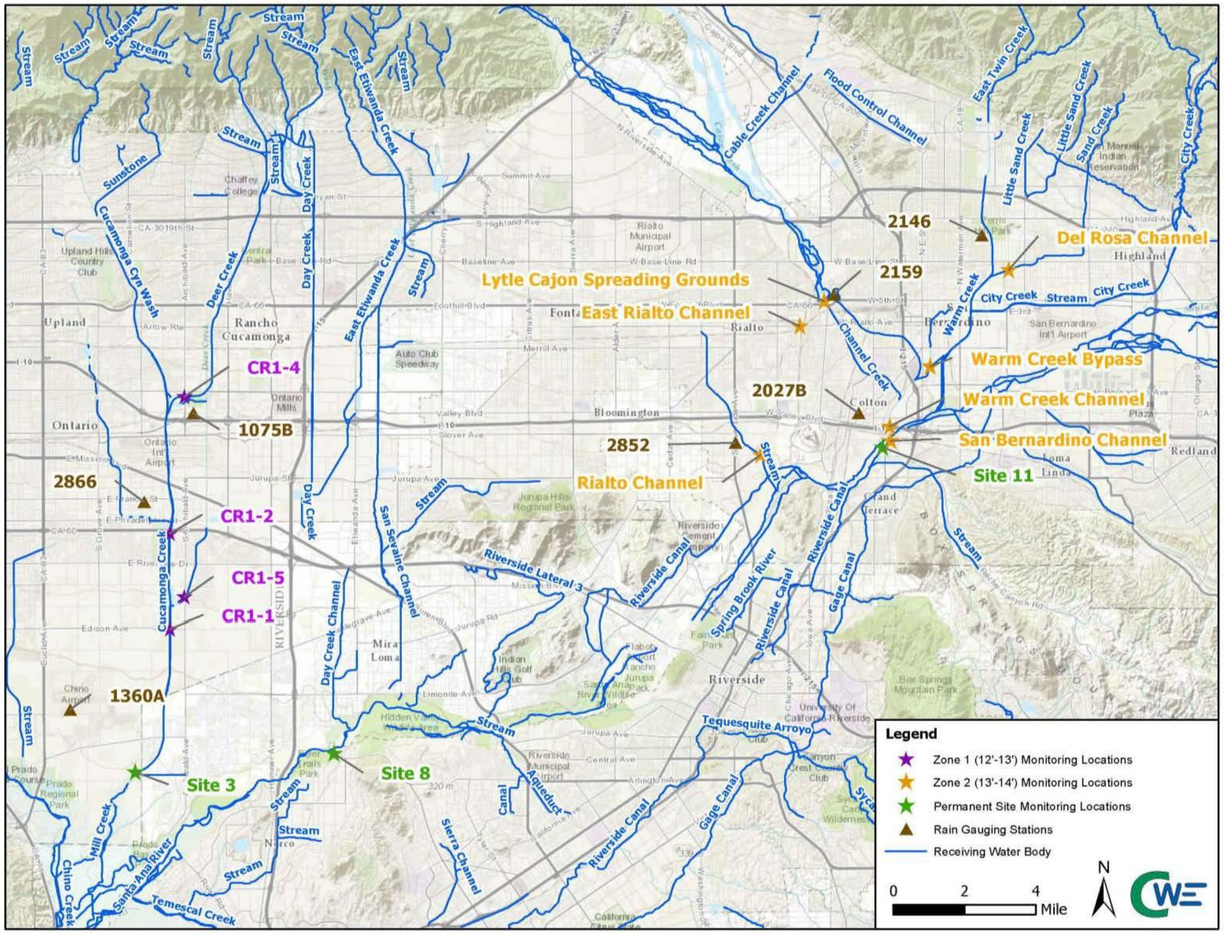

Figure 4.4.1 San Bernardino MS4 Permit Stormwater Monitoring Sites

Table 4-1 Summary of N-TDS Dry-Weather Monitoring Results

Location	No. of Samples	Flow, calc (cfs)	Nitrate-N (mg/L)	Nitrite-N (mg/L)	Ammonia-N (mg/L	TIN (mg/L), calc	TDS (mg/L)
Location 1 – Rialto Channel (discharges into the Santa Ana River Reach 4)							
Mean	12	0	NF	NF	NF	NF	NF
Std. Deviation		0	NF	NF	NF	NF	NF
Minimum		0	NF	NF	NF	NF	NF
Maximum		0	NF	NF	NF	NF	NF
Location 2 – Declez Channel (diverted into Declez Basin - captured and infiltrated)							
Mean	12	0.30	0.36	0.02	0.14	0.50	428
Std. Deviation		0.22	0.88	0.03	0.19	0.91	101
Minimum		0.02	0.02	0.02	0.03	0.05	290
Maximum		0.72	3.00	0.11	0.74	3.20	570
Location 3 – Wineville Basin Outlet (flows into Riverside Basin – captured and infiltrated)							
Mean	12	3.76	0.42	0.05	0.69	1.10	326
Std. Deviation		1.23	0.67	0.07	0.84	1.10	58
Minimum		1.40	0.02	0.02	0.05	0.08	210
Maximum		5.97	2.30	0.20	2.90	3.49	430
Location 4 – Cucamonga Channel (diverted into Mill Creek Wetlands for treatment)							
Mean	12	11.00	1.60	0.03	0.07	1.60	390
Std. Deviation		5.70	2.10	0.02	0.04	2.10	57
Minimum		3.40	0.02	0.02	0.03	0.00	280
Maximum		21.00	6.00	0.06	0.19	6.1	470
Location 5 – Cypress Channel (discharges into Prado Basin / Santa Ana River Reach 3)							
Mean	4	0.80	4.80	0.26	0.11	5.20	580
Std. Deviation		0.85	7.50	0.24	0.08	7.80	150
Minimum		0.17	0.19	0.03	0.04	0.29	380
Maximum		2.00	16	0.50	0.19	17.00	740

Table 4-1 Summary of N-TDS Dry-Weather Monitoring Results							
Location	**No. of Samples**	**Flow, calc (cfs)**	**Nitrate-N (mg/L)**	**Nitrite-N (mg/L)**	**Ammonia-N (mg/L**	**TIN (mg/L), calc**	**TDS (mg/L)**
Location 6 – San Antonio Creek (discharges into Prado Basin / Santa Ana River Reach 3)							
Mean	12	5.00	4.80	0.04	0.09	4.90	783
Std. Deviation		3.20	0.96	0.03	0.07	0.93	102
Minimum		2.10	3.00	0.02	0.03	3.30	620
Maximum		10.00	6.60	0.09	0.24	6.70	930
Location 7 – San Antonio Channel (discharges into Chino Creek / San Antonio Creek)							
Mean	12	29.00	0.77	0.01	0.20	0.97	659
Std. Deviation		19.00	1.30	0.01	0.12	1.20	112
Minimum		3.7	0.02	0.02	0.05	0.07	440
Maximum		68.00	4.20	0.03	0.48	4.30	780

Table 4-5 WQOs for Reach 3 of the Santa Ana River (Sites 3 and 8)						
Constituent	Units	Basin Plan Note on Beneficial Use	Basin Plan Objective (including Metals SSO)	CTR		
				Acute (1-hr Avg) Freshwater Aquatic Life	Chronic (4-day Avg) Freshwater Aquatic Life	Human Health (Water and Organisms)
Conventional						
COD	mg/L	Waterbody-specific	30	–	–	–
pH	pH units	All	6.5 - 8.5	–	–	–
TDS	mg/L	Waterbody-specific	700	–	–	–
DO	mg/L	WARM	5	–	–	–
Metals (Dissolved)						
Ag	µg/L		–	–	Varies[a]	–
As	µg/L		–	340	150	–
B	µg/L		750	–	–	–
Cd	µg/L	LWRM	Varies[a]	–	–	–
Cr[b]	µg/L		–	16.3	11.4	–
Cu	µg/L	LWRM	Varies[a]	–	–	1,300
Hg	µg/L		–	–	–	0.05
Pb	µg/L	LWRM	Varies[a]	–	–	–
Se	µg/L		–	20	5	–
Zn	µg/L		–	Varies[a]	Varies[a]	–
General Minerals						
Total Hardness	mg/L	Waterbody-specific	350	–	–	–
Sodium	mg/L	Waterbody-specific	110	–	–	–
Other						
Sulfate - SO_4	mg/L	Waterbody-specific	150	–	–	–
Chloride	mg/L	Waterbody-specific	140	–	–	–
Cyanide	mg/L			22	5	700
Total Inorganic N	mg/L	Waterbody-specific	10	–	–	–

Table 4-5 WQOs for Reach 3 of the Santa Ana River (Sites 3 and 8)

Constituent	Units	Basin Plan Note on Beneficial Use	Basin Plan Objective (including Metals SSO)	CTR		
				Acute (1-hr Avg) Freshwater Aquatic Life	Chronic (4-day Avg) Freshwater Aquatic Life	Human Health (Water and Organisms)
Microbiology						
Fecal Coliform	MPN/100 mL	REC-1	400	–	–	–
E.coli	MPN/100 mL	TMDL	126	–	–	–

NOTES:
Beneficial Uses – AGR = Agricultural Supply; LWRM = Limited Warm Freshwater Habitat; MUN = Municipal and Domestic Supply; REC-1 = Water Contact Recreation; WARM = Warm Freshwater Habitat

[a] CTR and Basin Plan metals objectives were calculated using event-specific hardness. See the results in **Appendix M** for the appropriate WQOs.

[b] The Chromium VI CTR objective is used to assess compliance for all chromium species

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APPENDIX D: LOS ANGELES WATER QUALITY DATA

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Table 4-1. Summary of Hydrologic Data for Mass Emission Stations

Event ID	Station Name	WRD RAIN GAUGE	WRD FLOW GAUGE	Total Precipitation (in.)	Rainfall Duration (hrs)	Avg. Rainfall Intensity (in./hr)	Base Flow Volume (acre-ft)	Total Runoff Volume (acre-ft)	High Flow Suspension of Bacteria WQO***
2012-13Event04	L.A. River at Wardlow (S10)	314	F319-R	0.77	11:59	0.06	488.8	6,685.9	Yes
2012-13Event04	Dominguez Channel (S28)	315	manual*	0.80	21:37	0.04	7.9	39.6	Yes
2012-13Event04	Malibu Creek (S02)	319	F130-R	0.19	0:15	0.76	NS	NS	NA
2012-13Event04	Coyote Creek (S13)	1140**	F354-R	0.04	5:52	0.01	49.0	182.5	No
2012-13Event04	San Gabriel River (S14)	416	F263C-R	0.39	3:24	0.11	3.1	172.2	No
2012-13Event04	Ballona Creek (S01)	370	F38C-R	NA	NA	NA	NS	NS	NA
2012-13Event04	Santa Clara River (S29)	406	F92C	0.03	10:58	0.00	NS	NS	NA
2012-13Event05	L.A. River at Wardlow (S10)	375	F319-R	0.20	4:10	0.05	898.8	5,632.7	No
2012-13Event05	Dominguez Channel (S28)	315	manual*	0.14	11:56	0.01	11.3	69.0	No
2012-13Event05	Malibu Creek (S02)	319	F130-R	0.87	39:44	0.02	4.0	19.8	NA
2012-13Event05	Coyote Creek (S13)	326	F354-R	0.08	40:13	0.00	64.1	491.7	No
2012-13Event05	San Gabriel River (S14)	416	F263C-R	0.38	16:33	0.02	5.0	32.8	No
2012-13Event05	Ballona Creek (S01)	370	F38C-R	0.20	0.52	0.02	66.1	553.1	No
2012-13Event05	Santa Clara River (S29)	406	F92C	0.48	22:23	0.02	NS	NS	NA
2012-13Event06	L.A. River at Wardlow (S10)	375	F319-R	0.51	23:09	0.02	883.9	8,337.4	Yes
2012-13Event06	Dominguez Channel (S28)	315	manual*	0.66	43:31	0.02	20.2	318.0	Yes
2012-13Event06	Malibu Creek (S02)	319	F130-R	0.90	38:26	0.02	5.4	68.7	NA
2012-13Event06	Coyote Creek (S13)	326	F354-R	0.55	33:51	0.02	150.7	1,381.4	No
2012-13Event06	San Gabriel River (S14)	416	F263C-R	0.63	35:35	0.02	NS	NS	NA
2012-13Event06	Ballona Creek (S01)	370	F38C-R	0.83	1.45	0.02	53.5	1,710.2	Yes
2012-13Event06	Santa Clara River (S29)	406	F92C	0.39	37:30	0.01	NS	NS	NA
2012-13Event07	L.A. River at Wardlow (S10)	375	F319-R	0.20	8:32	0.02	812.6	6,998.7	No
2012-13Event07	Dominguez Channel (S28)	315	manual*	0.20	10:08	0.02	7.1	145.4	No
2012-13Event07	Malibu Creek (S02)	319	F130-R	0.28	36:27	0.01	38.9	79.7	NA
2012-13Event07	Coyote Creek (S13)	326	F354-R	0.71	11:41	0.06	64.6	2,238.8	Yes
2012-13Event07	San Gabriel River (S14)	416	F263C-R	0.71	15:46	0.05	146.0	409.4	Yes
2012-13Event07	Ballona Creek (S01)	370	F38C-R	0.27	0.42	0.03	53.6	703.6	No
2012-13Event07	Santa Clara River (S29)	406	F92C	NA**	NA**	N/A	NS	NS	NA
2012-13Event08	L.A. River at Wardlow (S10)	375	F319-R	0.08	1:35	0.05	481.7	2,727.3	No
2012-13Event08	Dominguez Channel (S28)	315	manual*	0.16	8:15	0.02	3.1	20.5	No
2012-13Event08	Malibu Creek (S02)	319	F130-R	0.51	5:38	0.09	NS	NS	NA
2012-13Event08	Coyote Creek (S13)	326	F354-R	0.39	8:11	0.05	13.4	957.8	No
2012-13Event08	San Gabriel River (S14)	416	F263C-R	1.37	9:23	0.15	32.4	537.6	Yes
2012-13Event08	Ballona Creek (S01)	370	F38C-R	0.12	0:45	0.16	47.4	179.2	No
2012-13Event08	Santa Clara River (S29)	406	F92C	0.20	4:57	0.04	2.7	14.7	NA
2012-13Event11	L.A. River at Wardlow (S10)	375	F319-R	0.43	10:15	0.04	452.3	3,602.6	No
2012-13Event11	Dominguez Channel (S28)	315	manual*	0.12	5:53	0.02	4.4	79.3	No
2012-13Event11	Malibu Creek (S02)	319	F130-R	0.23	8:11	0.03	NS	NS	NA
2012-13Event11	Coyote Creek (S13)	326	F354-R	0.12	1:29	0.08	40.1	433.4	No
2012-13Event11	San Gabriel River (S14)	416	F263C-R	0.95	11:17	0.08	NS	NS	NA
2012-13Event11	Ballona Creek (S01)	370	F38C-R	0.43	27:03	0.02	43.4	932.9	No
2012-13Event11	Santa Clara River (S29)	406	F92C	0.19	31:03	0.01	NS	NS	NA
2012-13Event12	L.A. River at Wardlow (S10)	375	F319-R	0.31	2:24	0.13	587.9	7,902.8	No
2012-13Event12	Dominguez Channel (S28)	315	manual*	0.69	8:15	0.08	4.6	661.7	Yes
2012-13Event12	Malibu Creek (S02)	319	F130-R	1.42	41:37	0.03	47.6	217.0	NA
2012-13Event12	Coyote Creek (S13)	326	F354-R	0.51	28:15	0.02	42.7	1,716.2	Yes
2012-13Event12	San Gabriel River (S14)	416	F263C-R	0.35	5:01	0.07	NS	NS	NA
2012-13Event12	Ballona Creek (S01)	370	F38C-R	0.95	11:11	0.08	NS	NS	NA
2012-13Event12	Santa Clara River (S29)	406	F92C	0.20	35:16	0.01	NS	NS	NA

Table 4-1. Summary of Hydrologic Data for Mass Emission Stations

Event ID	Station Name	WRD RAIN GAUGE	WRD FLOW GAUGE	Total Precipitation (in.)	Rainfall Duration (hrs)	Avg. Rainfall Intensity (in./hr)	Base Flow Volume (acre-ft)	Total Runoff Volume (acre-ft)	High Flow Suspension of Bacteria WQO***
2012-13Event13	L.A. River at Wardlow (S10)	375	F319-R	0.32	3:43	0.09	NS	NS	NA
2012-13Event13	Dominguez Channel (S28)	315	manual*	0.13	5:37	0.02	9.2	126.4	No
2012-13Event13	Malibu Creek (S02)	319	F130-R	0.16	2:56	0.05	NS	NS	NA
2012-13Event13	Coyote Creek (S13)	326	F354-R	0.08	0:23	0.21	NS	NS	NA
2012-13Event13	San Gabriel River (S14)	416	F263C-R	0.28	3:05	0.09	NS	NS	NA
2012-13Event13	Ballona Creek (S01)	370	F38C-R	0.19	3:24	0.06	73.6	644.7	No
2012-13Event13	Santa Clara River (S29)	406	F92C	0.12	1:00	0.12	NS	NS	NA
2012-13Event14	L.A. River at Wardlow (S10)	375	F319-R	0.63	8:43	0.07	573.8	10,196.3	Yes
2012-13Event14	Dominguez Channel (S28)	315	manual*	0.85	42:31	0.02	7.2	348.0	Yes
2012-13Event14	Malibu Creek (S02)	319	F130-R	1.03	11:08	0.09	5.5	200.9	NA
2012-13Event14	Coyote Creek (S13)	326	F354-R	0.67	38:55	0.02	25.3	1,735.3	Yes
2012-13Event14	San Gabriel River (S14)	416	F263C-R	1.10	39:08	0.03	12.7	306.4	Yes
2012-13Event14	Ballona Creek (S01)	370	F38C-R	0.70	8:16	0.08	43.0	1,787.1	Yes
2012-13Event14	Santa Clara River (S29)	406	F92C	0.82	12:40	0.06	NS	NS	NA
2012-13Event15	L.A. River at Wardlow (S10)	375	F319-R	0.16	20:18	0.01	645.5	3,931.1	No
2012-13Event15	Dominguez Channel (S28)	315	manual*	0.12	6:47	0.02	12.7	155.2	No
2012-13Event15	Malibu Creek (S02)	319	F130-R	0.71	19:37	0.04	8.3	238.5	NA
2012-13Event15	Coyote Creek (S13)	326	F354-R	0.04	6:28	0.01	53.5	899.0	No
2012-13Event15	San Gabriel River (S14)	416	F263C-R	0.08	1:47	0.04	18.1	267.3	No
2012-13Event15	Ballona Creek (S01)	370	F38C-R	0.40	27:09	0.01	100.9	428.2	No
2012-13Event15	Santa Clara River (S29)	406	F92C	0.14	18:20	0.01	3.5	19.2	No
2012-13Event17	L.A. River at Wardlow (S10)	375	F319-R	0.16	1:48	0.09	589.3	3,252.7	No
2012-13Event17	Dominguez Channel (S28)	315	manual*	0.08	9:21	0.01	6.9	53.8	No
2012-13Event17	Malibu Creek (S02)	319	F130-R	0.15	1:25	0.11	3.9	22.9	NA
2012-13Event17	Coyote Creek (S13)	326	F354-R	0.04	1:00	0.04	191.4	516.8	No
2012-13Event17	San Gabriel River (S14)	416	F263C-R	0.59	8:48	0.02	57.0	359.6	Yes
2012-13Event17	Ballona Creek (S01)	370	F38C-R	0.12	0:38	0.19	44.1	254.1	No
2012-13Event17	Santa Clara River (S29)	406	F92C	0.12	7:04	0.02	3.5	9.0	No
2012-13Event18	L.A. River at Wardlow (S10)	375	F319-R	0.47	3:20	0.14	1379.8	11,757.4	No
2012-13Event18	Dominguez Channel (S28)	315	manual*	0.62	23:44	0.03	7.1	349.0	Yes
2012-13Event18	Malibu Creek (S02)	319	F130-R	0.83	18:29	0.04	10.5	181.7	NA
2012-13Event18	Coyote Creek (S13)	326	F354-R	0.47	4:10	0.11	136.9	1,406.2	No
2012-13Event18	San Gabriel River (S14)	416	F263C-R	0.51	25:33	0.02	47.2	198.7	No
2012-13Event18	Ballona Creek (S01)	370	F38C-R	0.63	5:50	0.11	162.5	2,222.2	Yes
2012-13Event18	Santa Clara River (S29)	406	F92C	0.83	6:24	0.13	40.4	297.4	No
2012-13Event21	L.A. River at Wardlow (S10)	314	F319-R	0.77	32:12	0.02	1,203.5	9,169.6	No
2012-13Event21	Dominguez Channel (S28)	315	manual*	0.60	32:26	0.02	7.1	97.8	No
2012-13Event21	Malibu Creek (S02)	319	F130-R	0.55	3:03	0.18	20.9	46.5	NA
2012-13Event21	Coyote Creek (S13)	326	F354-R	0.63	6:03	0.10	56.1	1,028.6	Yes
2012-13Event21	San Gabriel River (S14)	416	F263C-R	0.31	7:09	0.04	22.2	79.4	No
2012-13Event21	Ballona Creek (S01)	370	F38C-R	0.75	7:30	0.10	254.8	617.1	Yes
2012-13Event21	Santa Clara River (S29)	406	F92C	0.44	5:48	0.08	NS	NS	NA

NS - No sampling conducted druing this event

* Manual = Flow measured by Watershed Management Division auto sampler. Water Resources Division has no flow gauge here.

** Orange County Rain Gage: Fullerton Airport

*** High flow suspension of the REC-1 and REC-2 bacteria water quality objectives does not apply to Malibu Creek and Santa Clara River MES.

TABLE 4-2a. 2012-13 Annual Monitoring Report
Number of Sampling Events

WET WEATHER								
Site ID/ Station Name	Grab Samples		Composite Samples					
	Conventional Pollutants	Bacteria	General Minerals	Heavy Metals	Semi-Volatiles	Pesticides	TSS	Toxicology
Mass Emisions								
S01 - Ballona Creek at Sawtelle	6	6	7	7	7	7	11	2
S13 - Coyote Creek*	6	6	7-8	8	8	7	11	2
S28 - Dominguez Channel at Artesia Blvd	7	7	8	8	8	8	13	2
S02 - Malibu Creek at Piuma Rd	5	5	6	6	6	6	9	2
S10 - Los Angeles River at Wardlow Rd	7	7	8	8	8	8	12	2
S14 - San Gabriel River at SGR Pkwy	5	5	5	5	5	5	8	2
S29 - Santa Clara River at Old Road	4	4	4	4	4	4	4	2
Malibu Creek Tributaries								
Upper Las Virgenes at Parkmor (TS25)	5	5	6	6	6	6	6	0
Cheseboro Canyon (TS26)*	5	5	6-7	7	7	6	6	0
Lower Lindero Canyon (TS27)	5	5	6	6	6	6	6	0
Medea Creek (TS28)*	5	5	6-7	7	7	6	6	0
Liberty Canyon Channel (TS29)	5	5	6	6	6	6	6	0
PD 728 at Foxfield Dr (TS30)	5	5	6	6	6	6	6	0

*During 2012-13Event04 enough sample was collected to analyze only a subset of the composite sample analytes.

Table 4-6: Total Suspended Solids Concentration at Mass Emissions Stations (mg/L)

Event Code	Ballona Creek at Sawtelle Blvd. S01	Malibu Creek at Piuma Rd. S02	Los Angeles River at Wardlow Rd. S10	Coyote Creek at Spring St. S13	San Gabriel River at SGR Parkway S14	Dominguez Channel at Artesia Blvd. S28	Santa Clara River S29
DRY WEATHER							
2012-13Event03 (10/09/2012)	44	4	136	48	NF	47	9
2012-13Event20	2	>1&<2	34	10	NF	18	<1
WET WEATHER							
2012-13Event04 (10/11/2012)	NS	NS	134	NS*	220	122	NS
2012-13Event05 (11/17/2012)	152	17	498	1280	81	323	NS
2012-13Event06 (11/30/2012)	116	16	122	278	NS	122	NS
2012-13Event07 (12/02/2012)	56	22	214	314	NS**	89	NS
2012-13Event08 (12/13/2012)	162	NS	341	442	50	166	75
2012-13Event11 (12/18/2012)	397	NS	163	173	NS	227	NS
2012-13Event12 (12/23/2012)	NS	167	379	115	NS	147	NS
2012-13Event13 (12/26/2012)	91	NS	NS	NS	NS	69	NS
2012-13Event14 (01/24/2013)	137	40	175	97	145	109	NS
2012-13Event15 (01/25/2013)	190	12	125	48	19	66	15
2012-13Event17 (02/19/2013)	149	1.2	71	118	13	314	8.8
2012-13Event18 (03/07/2013)	223	61	272	189	20	215	269
2012-13Event21 (05/08/2013)	132	5	210	321	16	155	NS

NS - Not sampled

NF - No flow

* Due to limited sample quantity TSS was not analyzed at S13 during 2012-13Event04

**Composite samples were not collected due to equipment malfunction.

Table 4-8. Total Suspended Solid Loads at Mass Emissions Stations (pounds)

Event Code	Ballona Creek at Sawtelle Blvd. S01	Malibu Creek at Piuma Rd. S02	Los Angeles River at Wardlow Rd. S10	Coyote Creek at Spring Street S13	San Gabriel River at SGR Parkway S14	Dominguez Channel at Artesia Blvd. S28	Santa Clara River S29
DRY WEATHER							
2012-13Event03	8,193.797	28.751	153,074.267	1,370.899	NF	1,048.559	24.301
2012-13Event20	387.430	4.762	42,168.822	1,614.975	NF	404.590	1.561
WET WEATHER							
2012-13Event04	NS	NS	2,436,296.842	NS	103,025.432	13,142.171	NS
2012-13Event05	228,614.683	915.586	7,628,017.052	1,711,421.057	7,221.905	60,572.044	NS
2012-13Event06	539,461.481	2,990.971	2,766,014.962	1,044,277.565	NS	105,499.147	NS
2012-13Event07	107,153.368	4,411.551	4,072,823.765	1,911,636.263	NS	35,190.514	NS
2012-13Event08	78,963.838	NS	2,528,992.054	1,151,218.973	73,095.728	9,245.220	3,007.280
2012-13Event11	1,007,183.173	NS	1,596,851.802	203,875.174	NS	48,950.749	NS
2012-13Event12	NS	98,553.078	8,144,804.368	536,695.174	NS	264,507.039	NS
2012-13Event13	159,540.420	NS	NS	NS	NS	23,709.850	NS
2012-13Event14	665,798.977	21,853.175	4,852,258.396	457,730.383	120,806.508	103,135.082	NS
2012-13Event15	221,228.593	7,781.655	1,336,236.081	117,345.163	13,809.497	27,849.825	781.270
2012-13Event17	102,966.707	74.758	628,008.493	165,824.158	12,712.613	45,978.125	215.796
2012-13Event18	1,347,560.538	30,140.146	8,696,502.170	722,714.486	10,805.195	204,031.340	217,552.454
2012-13Event21	221,518.980	632.417	5,236,396.595	897,875.319	3,454.462	41,215.505	NS

NS= Not Sampled
NF=No Flow

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