Lower San Gabriel River Watershed Management Program

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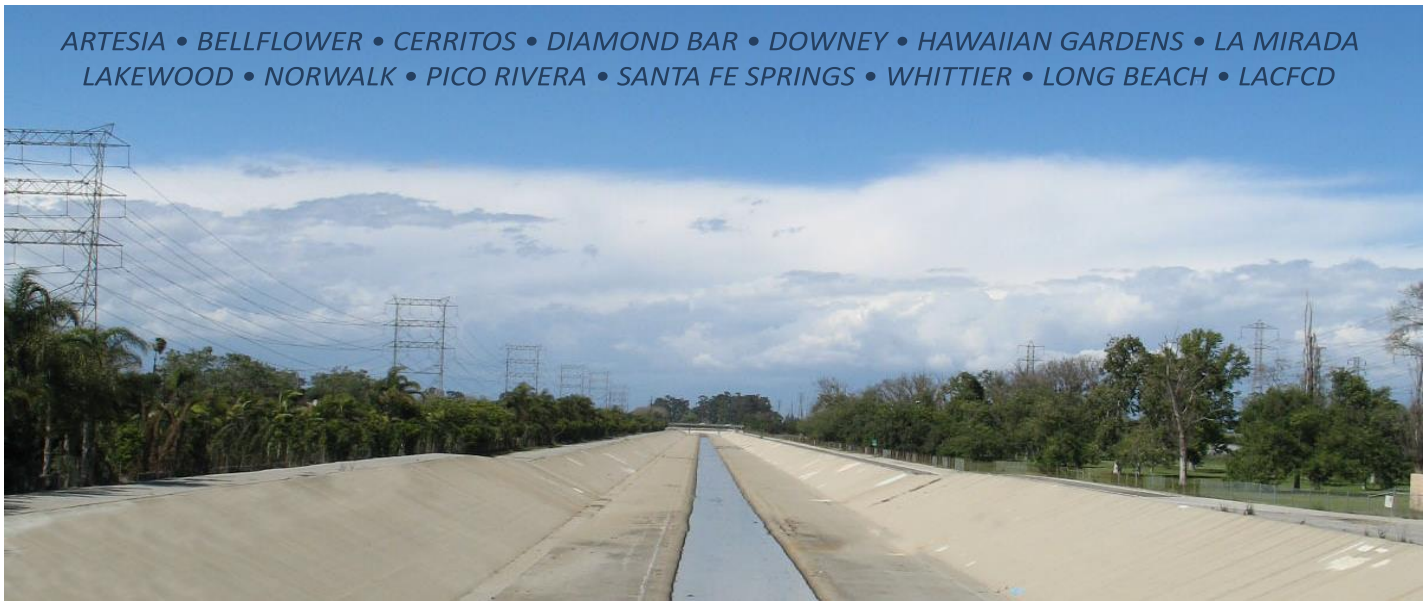

Prepared For:

Lower San Gabriel River Watershed Group

Prepared By:

John L. Hunter and Associates, Inc.

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EXECUTIVE SUMMARY

This Watershed Management Program (WMP) sets forth a path to achieve reductions in the pollutants in the waterbodies of the Lower San Gabriel River and its tributaries. The WMP includes: a discussion of existing and planned watershed control measures; a Reasonable Assurance Analysis (RAA) based upon the Watershed Management Modeling System previously developed by the Los Angeles County Flood Control District in collaboration with the USEPA; and a Coordinated Integrated Monitoring Program (CIMP) being implemented over a four year period which began in 2013 with the installation of an early action monitoring site.

The agencies of the Lower San Gabriel River (SGR) Watershed have been working cooperatively towards the goal of a cleaner watershed for several years. In 2011 the cities tributary to Coyote Creek (a major tributary of the San Gabriel River) formed a Technical Committee to address the USEPA's Metals TMDL. As the Regional Board neared completion of the current fourth term MS4 Permit, and as many of the Technical Committee agencies also had areas tributary to the San Gabriel River and in some cases San Jose Creek, the Technical Committee rapidly expanded to include these areas. Funding for the Technical Committee was originally approved by City Councils and agency governing boards through a Memorandum of Understanding (MOU) for the TMDL, which was quickly superseded by a second MOU with funding through December 31, 2022, for selected activities pertaining to the WMP and CIMP provisions of the fourth term MS4 permit. Through this cooperative effort, the Technical Committee requested and supported the Regional Board's effort to adopt a Basin Plan Amendment for a Metals TMDL implementation schedule which was accomplished in June of 2013. This cooperative effort continues and in 2014, the Watershed Group was notified of their successful multi-city grant application (as part of a larger Gateway effort) to install 17 LID BMPs along selected major thoroughfares.

Prior to 2012, MS4 permits required cities and agencies to implement a series of best management practices such as street sweeping and catch basin cleaning to demonstrate compliance. With the adoption of the fourth term MS4 permit by the Los Angeles Regional Water Quality Control Board on November 8, 2012, the emphasis shifted to a more watershed based effort that includes the goals of achieving specific pollutant targets as runoff leaves the storm drain system and enters the main river channels. This WMP and the accompanying RAA and CIMP constitute the first step in that watershed based effort.

The jurisdictional boundaries of the Lower San Gabriel River Watershed are complex. Coyote Creek has a larger drainage area in Orange County which is under a separate MS4 Permit issued by a different Regional Board. Efforts to coordinate activities between the areas of Orange and Los Angeles County are in their infancy and would benefit from a realignment of the two MS4 Permits. Many Cities have drainage areas in multiple watersheds. To facilitate the implementation of control measures and minimize the impact of multiple watershed implementation plans within a single city, the Cities have combined the efforts of the Lower Los Angeles River Watershed and the Los Cerritos Channel to create similar Watershed Management Programs. Two cities have areas that drain to San Jose Creek, also tributary to the San Gabriel River – these areas have been included in this WMP.

This WMP is a long-term planning document that takes a comprehensive look at the Lower SGR Watershed, including its land uses, MS4 system, existing and planned control measures (both structural and nonstructural), existing storm water treatment systems, historical monitoring data and the various segments of the San Gabriel River and its tributaries that have been identified as impaired by various pollutants. Using that data, the Watershed Management Modeling System, one of the three modeling system authorized by the MS4 Permit, is used to generate a Reasonable Assurance Analysis (RAA) which predicts an optimal combination of structural treatment systems and construction timelines to achieve the goals of the MS4 Permit. The RAA spreads responsibility for implementation of future treatment systems amongst all Participating Agencies.

The RAA identifies wet weather zinc as the primarily pollutant of concern[1]. This means that by designing treatment systems and other nonstructural controls measures for zinc, the targets for other pollutants of concern will also be met. The first target for zinc occurs in 2017, when 10 percent wet weather reduction of zinc must be demonstrated. The next targets specified in the MS4 Permit occur in 2020, 2023 and 2026 when 35, 65 and 100 percent respectively of the wet weather zinc reductions must be demonstrated. This WMP establishes milestones that are to be met through the implementation of enhanced nonstructural control measures (such as the City of Whittier's existing vacant parcel sediment ordinance that targets sediment reduction) and construction of structural treatment projects (such as the City of Downey's Discovery Park infiltration system and over 500 existing individual treatment systems).

The RAA provides a recommended volume of runoff on a city-by-city basis that must be treated in order to meet the milestones. In total, the RAA establishes a final (2026) goal of capturing and treating a cumulative 37 acre feet in the San Gabriel and 81.6 acre feet in the Coyote Creek portions of the Lower SGR Watershed. The ultimate cost will vary considerably depending on the availability and configuration of suitable treatment locations and effectiveness of nonstructural watershed control measures but is estimated to be cumulatively in the range of $33 to $65 million. The treatment volumes recommended by the RAA are estimates based on current land used data, historical monitoring and assumed treatment system efficiencies. The WMP also incorporates an adaptive management strategy to adjust and modify the various control measures as necessary.

A Coordinated Integrated Monitoring Program (CIMP) has been developed at a part of this WMP and greatly expands the monitoring of water quality in the Lower SGR Watershed. The CIMP goals are in part to measure the overall effectiveness of the control measures the Participating Agencies are implementing. Currently the Mass Emission Station operated by the Los Angeles County Flood Control District near the mouth of Coyote Creek is the only regularly monitored station in the watershed. A second Mass Emission Station located in the upstream section of the San Gabriel River near the Whittier Narrow Dam is conducting regular monitoring but due to its upstream location is only providing background and general health of the river monitoring information for the downstream portions of the San Gabriel River into which the Participating Agencies discharge.

[1] The discharge of copper is anticipated to be reduced as copper is removed from brake pads over the next decade.

The CIMP identifies five new monitor sites that will be phased in over a multi-year period and will include outfall and TMDL monitoring. The first of these sites has already been installed and is in operation at the base of the North Fork of Coyote Creek. Upon approval of the CIMP, a second station will be installed along the downstream portion of the San Gabriel River as it enters the estuary. Two stations will be added the following year and three potential sites have been identified for the year following that.

This WMP and its components, including Chapter 3 *Selection of Watershed Control Measures*, Chapter 4 *RAA* and Chapter 8 *CIMP* outline a path to achieve significantly improved water quality in the Lower SGR Watershed. The WMP outlines a path based on the optimal placement of treatment systems determined by the RAA, but this is not the only viable path. The agencies of the LSGR can follow the adaptive management strategy described in Chapter 9 to adjust the number, locations and sizes of future treatment systems as long as the timelines and goals of this WMP are followed. While this WMP has been developed to establish treatment and capture goals on an agency-by-agency basis, it does not preclude those agencies from collaborating (in actuality, collaboration is encouraged) on a regional and multi-agency basis.

As part of the overall collaborative and inclusive effort, this Draft Watershed Management Program was presented at a public stakeholder meeting at the Lakewood City Hall on April 30, 2014. The Watershed Control Measures, Reasonable Assurance Analysis and Coordinated Integrated Monitoring Programs were discussed and comments from interested members of the public were solicited.

1 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

This Watershed Management Program (WMP) has been developed to implement the requirements of Los Angeles Regional Water Quality Control Board Order Nos. R4-2012-0175 and R4-2014-0024 (National Pollutant Discharge Elimination System (NPDES) Permit Nos. CA004001, CA004003 respectively) on a watershed scale. In addition, elements of this WMP relating to Total Maximum Daily Loads (TMDLs) address requirements of California State Water Resources Control Board Order No. 2012-0011-DWQ (the Caltrans Stormwater Permit) for those TMDLs within the watershed area as described in the Section 1.1.4. Combined, the Orders set forth waste discharge requirements for the Municipal Separate Storm Sewer (MS4) discharges by Caltrans, the Los Angeles County Flood Control District (LACFCD), the County of Los Angeles and 85 cities within the coastal watersheds of Los Angeles County (Permittees). These requirements include three fundamental elements: (i) effectively prohibit nonstormwater discharges through the MS4, (ii) implement controls to reduce the discharge of pollutants to the maximum extent practicable, and (iii) other provisions the Regional Water Board has determined appropriate for the control of such pollutants.[1] The ultimate goals of the WMP are listed in Section 1.2.3.

1.1.1 PARTICIPATING AGENCIES

This WMP is a collaborative effort of fourteen participating agencies with MS4 facilities within the subwatersheds[2] of Coyote Creek, Reaches 1, 2 and 3 of the San Gabriel River and San Jose Creek. For the purposes of this WMP, the area defined by the boundaries of the participating agencies with these subwatersheds is referred to as the Lower San Gabriel River Watershed (Lower SGR Watershed). The participating agencies and their respective MS4 stormwater Permits addressed by this WMP are listed in Table 1-1.

1.1.2 MS4 PERMITS ADDRESSED

As noted in Table 1-1, Caltrans and the City of Long Beach are regulated under their own MS4 Permits, separate from the Los Angeles MS4 Permit. The extent to which this impacts the contents of this WMP is explained in this section.

LONG BEACH AND LOS ANGELES MS4 PERMITS

The Long Beach and Los Angeles MS4 Permits, adopted by the Los Angeles Regional Water Quality Control Board (Regional Board) within 15 months of each other, contain similar language and requirements. Specifically, both Permits include an optional WMP approach to compliance. These similarities allow for the preparation of one WMP to address the requirements of both permits. Except

[1] LA County NPDES MS4 Permit Findings, page 20.

[2] Subwatersheds within this WMP are the "HUC-12 Equivalent" drainage areas as defined in 1.1.4.

where otherwise noted, the term *MS4 Permit* will refer exclusively to the Los Angeles and Long Beach MS4 Permits.

Table 1-1: Participating Agencies of the Lower SGR Watershed

Agency	Permit Order No.	Permit Name
Artesia	R4-2012-0175	Los Angeles County NPDES MS4 Permit (LA MS4 Permit)
Bellflower		
Cerritos		
Diamond Bar		
Downey		
Hawaiian Gardens		
La Mirada		
LACFCD[3]		
Lakewood		
Norwalk		
Pico Rivera		
Santa Fe Springs		
Whittier		
Long Beach	R4-2014-0024	Long Beach NPDES MS4 Permit (LB MS4 Permit)
Caltrans[3]	2012-0011-DWQ	Caltrans Stormwater Permit (Caltrans MS4 Permit)

CALTRANS STORMWATER PERMIT

Discharges to Caltrans' MS4 are regulated through the Caltrans MS4 Permit. Although the Caltrans Permit does not include a WMP compliance approach like the Los Angeles and Long Beach MS4 Permits, its TMDL provisions do require cooperation with agencies subject to the same TMDLs. As such, Caltrans' participation is restricted to those sections of the WMP related to TMDL requirements. Caltrans has acknowledged their intent to participate.

1.1.3 NON-PARTICIPATING AGENCIES

All other NPDES MS4 permitted agencies within these subwatersheds that are not listed in Table 1-1 have developed either individual or collaborative draft WMPs or draft EWMPs separately and are not participating in this WMP. Non-participating agencies include the County of Los Angeles (unincorporated areas), the City of La Habra Heights, multiple cities within and upstream of Reach 3 of the San Gabriel River and San Jose Creek and the agencies draining to Coyote Creek located within Orange County. Figure 1-1 shows the participating agencies within the Lower SGR.

[3] LACFCD and Caltrans participation is restricted to their land and stormwater facilities within the Lower SGR Watershed.

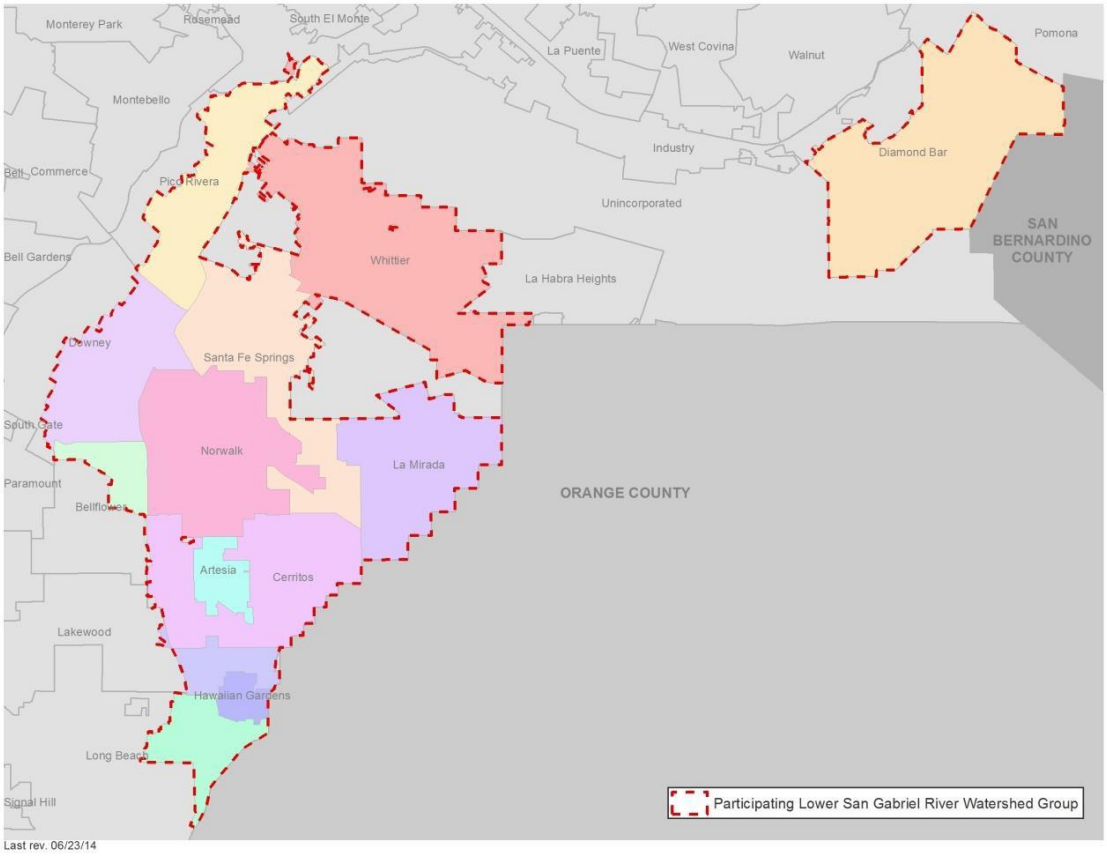

Figure 1-1: Participating Agencies map

1.1.4 THE LOWER SAN GABRIEL RIVER WATERSHED GROUP

DESIGNATION

Prior to the adoption of the MS4 permit, the participating agencies – with the exception of Caltrans, the LACFCD and the City of Pico Rivera – were under a Memorandum of Understanding to develop an Implementation Plan for the San Gabriel River Metals TMDL. After Permit adoption, this group decided to continue their collaborative efforts to develop a WMP. Caltrans, the LACFCD and the City of Pico Rivera decided to participate in this joint effort. The agencies' intent was to focus collective resources on water quality prioritization and implementation efforts to their shared receiving waters. The fourteen agencies submitted a Notice of Intent to develop a WMP to the Regional Board prior to the June 28, 2013[4], deadline and each signed a MOU to develop the WMP. Neighboring Los Angeles MS4 Permittees within the San Gabriel WMA chose to develop separate WMPs, either individually or collaboratively.

BOUNDARIES

The boundaries of the Lower SGR Watershed are both hydrological and jurisdictional. The jurisdictional boundaries, located in the east region, are primarily a consequence of the division of Coyote Creek

[4] The Notice of Intent was approved by the Regional Board on September 25, 2013

between the Counties of Los Angeles, Orange and San Bernardino. The Coyote Creek subwatershed is also split between Whittier and Diamond Bar, separated by the communities of La Habra Heights (incorporated) and Rowland Heights (unincorporated County), which are not participating in this WMP. In addition, the northeast boundary within the San Jose Creek subwatershed is defined by the jurisdictional boundaries of Diamond Bar. This WMP also applies to approximately 400 acres within Diamond Bar that does not have an MS4 draining to the San Gabriel River Watershed. The hydrological boundaries of Reach 1 and 2 of the San Gabriel River and Coyote Creek define the west region and most of the north region.

The Lower SGR Watershed is located within the San Gabriel River Watershed Management Area (WMA) as designated in the Los Angeles MS4 Permit (Figure B-5). The water bodies located within the Lower SGR Watershed - Coyote Creek, Reaches 1, 2 and 3 of the San Gabriel River and San Jose Creek - are defined by the Regional Board as inland Surface Waters of the State (A-9). As part of the main stem of the San Gabriel River, Reaches 1, 2 and 3 are considered Waters of the United States. By definition its tributaries are also Waters of the United States, which includes Coyote Creek and San Jose Creek (A-9). The drainage areas of these five water bodies in turn define five subwatersheds.

The main channels of the San Gabriel River, Coyote Creek and San Jose Creek and most of their tributaries are owned by the LACFCD, with the exception of a small area within the City of Pico Rivera owned by the Army Corps of Engineers. Figure 1-2 shows this area. Additionally, there are privately owned and maintained drains and open channels.

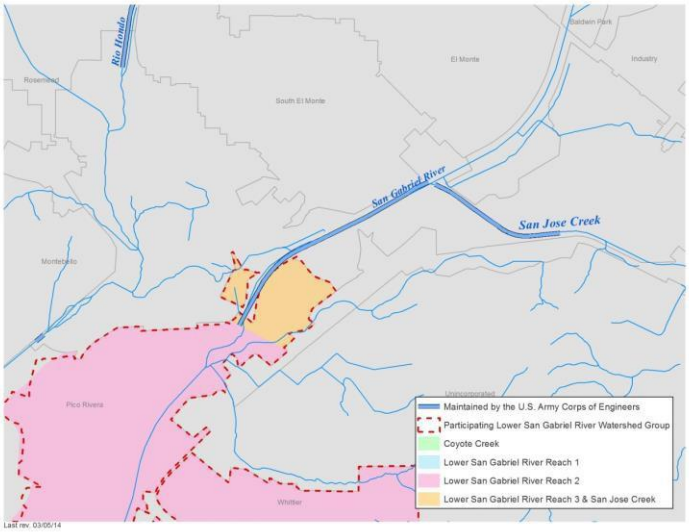

Figure 1-2: Extent of channel ownership by the Army Corps of Engineers

HYDROLOGIC UNIT CODES (HUC)

The United States Geological Survey's (USGS) Hydrologic Unit Codes (HUCs) are referenced in the MS4 Permits. The HUC system divides the United States into a hierarchical classification of defined, hydrologically-based watersheds. The LACFCD found that some of the HUC boundaries within the Los Angeles Basin were incorrect and have since developed more accurate "HUC equivalents". Following the

HUC Equivalent system, San Gabriel River Reach 1, 2 and 3 are within subwatershed 18070160606, Coyote Creek is within subwatersheds 180701060602, 180701060603 and 180701060606 and San Jose Creek is within subwatersheds 180701060501 and 180701060502. The subwatersheds of the Lower SGR Watershed are shown in Figure 1-3 and listed in Table 1-2.

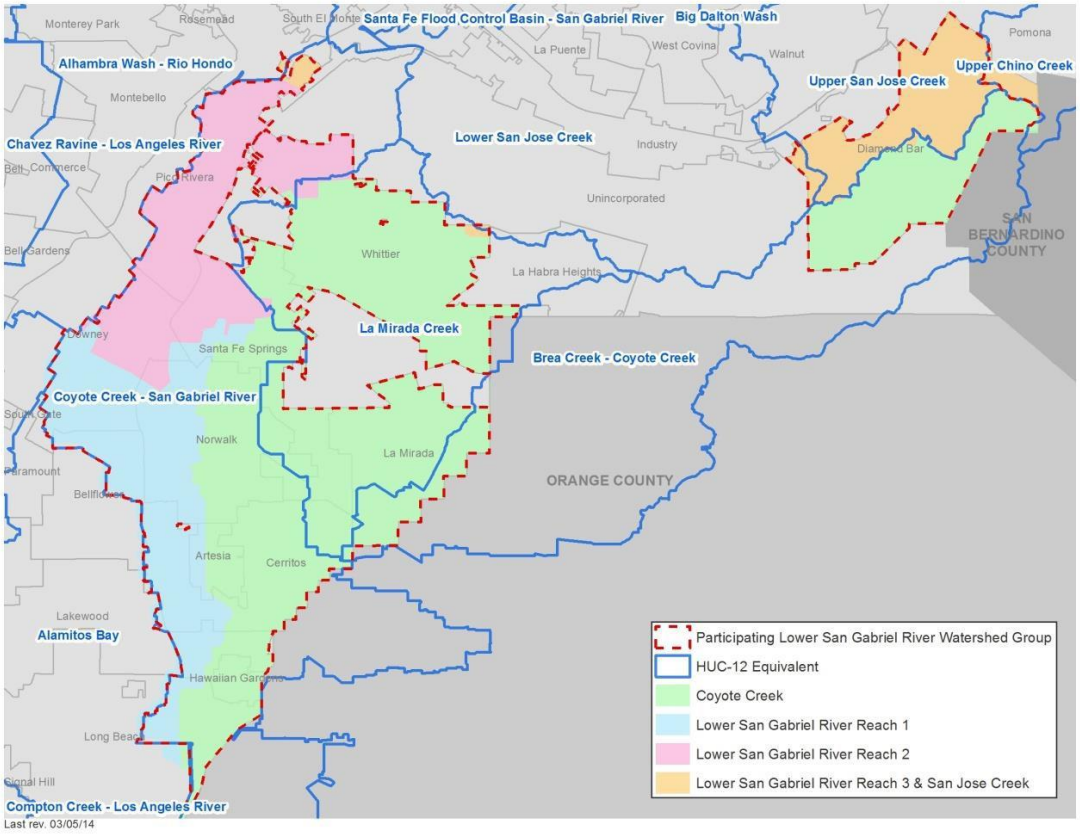

Figure 1-3: Watershed map with HUC-12 equivalent subwatershed

The subwatersheds defined by these 12 digit numbers are referred to as HUC-12. Groups of subwatersheds that share a common downstream waterbody form a watershed. A watershed is designated by the first 10 digits of a HUC-12 and as such is referred to as HUC-10. In the case of the Lower San Gabriel River Watershed, Coyote Creek and San Gabriel River Reach 1, 2 and 3 are within the Lower San Gabriel River HUC-10 watershed and San Jose Creek is itself a HUC-10 watershed. Both watersheds are within the San Gabriel HUC-08 subbasin, which shares most of its borders with the San Gabriel River WMA (Figure B-4).

WATERSHED AUTHORITY GROUP

Watershed Authority Groups (WAGs) as described in State Assembly Bill 2554, which in 2010 amended the Los Angeles County Flood Control District Act, are referenced in the MS4 Permits. The purpose of the WAGs is to implement collaborative water quality improvement projects and services, with the goal of improving water quality and reducing stormwater and urban runoff pollution. The creation and

funding of the WAGs has not yet occurred - it is dependent upon voter approval of the LACFCD's Water Quality Funding Initiative (a countywide parcel fee). AB 2554 divides the County into 9 WAGs - the LSGRW is located within the Lower San Gabriel River WAG, which shares borders with the Lower San Gabriel River HUC-10 watershed. Figure 1-4 is a complete map of the WAG groups.

Table 1-2: Subwatersheds/waterbodies within the Lower SGR Watershed

Subwatershed/ Waterbody	HUC 12 Equivalent	HUC Name	Area within Lower SGR Watershed (mi^2)
Coyote Creek	180701060602	La Mirada Creek	68.05
	180701060603	Brea Creek-Coyote Creek	
	180701060606	Coyote Creek-San Gabriel River	
San Gabriel Reach 1	180701060606	Coyote Creek-San Gabriel River	16.31
San Gabriel Reach 2	180701060606	Coyote Creek-San Gabriel River	15.45
San Gabriel Reach 3	180701060606	Coyote Creek-San Gabriel River	0.51
San Jose Creek	180701060501	Upper San Jose Creek*	7.7

* The USGS Hydrologic Unit Code Equivalent HUC boundaries created by LACFCD included the City of Diamond Bar in the Upper SJC HUC (180701060501); however, this designation does not coincide with the LA Basin Plan Reach designations that commence the Upper SJC (Reach 2) at Temple Avenue in Pomona. According to this designation, Diamond Bar drains solely to SJC Reach 1.

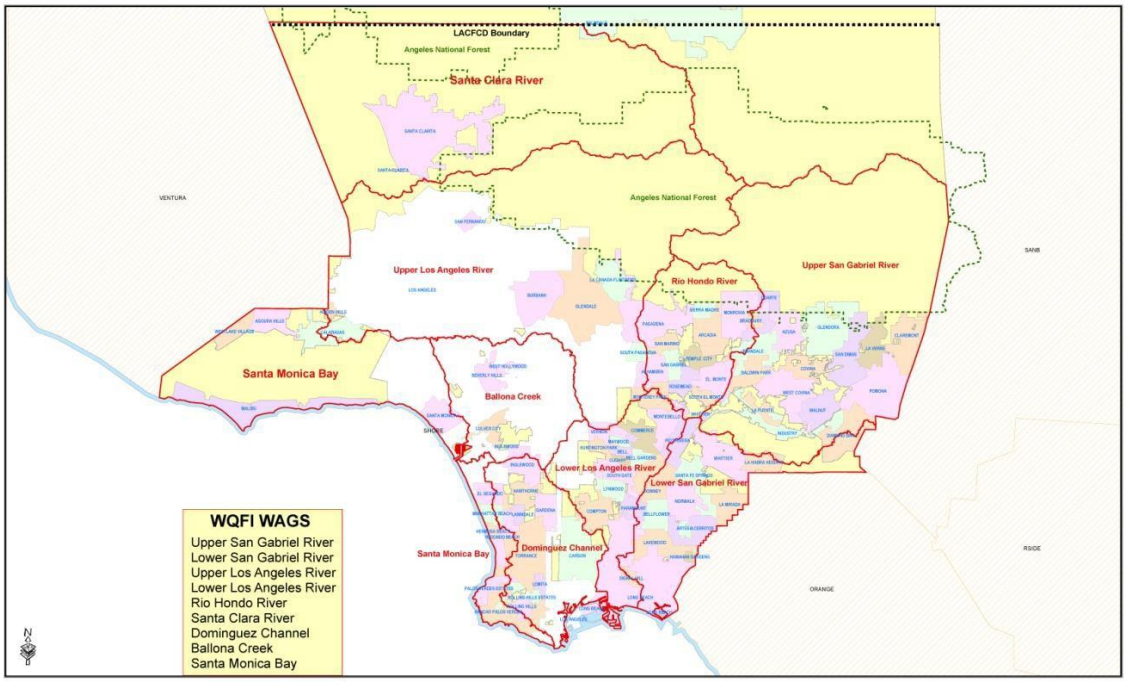

Figure 1-4: WAG map

1.2 THE WATERSHED MANAGEMENT PROGRAM

1.2.1 PURPOSE OF THE MS4 PERMIT

MS4s receive stormwater and non-stormwater discharges from various sources, including municipal MS4s and other public agencies, discharges under NPDES permits or authorized by the USEPA[5], groundwater and natural flow. As the discharges flow over the urban landscape, they may pick up pollutants generated by urban activities, such as metals, bacteria, pesticides, fertilizers and trash. Polluted stormwater and non-stormwater discharges conveyed through the MS4 ultimately reach receiving waters, resulting in adverse water quality impacts.[6]

The goal of the MS4 Permit is to reduce the discharge of these pollutants from MS4s to the maximum extent practicable.

1.2.2 WATERSHED MANAGEMENT EMPHASIS

The watershed management approach to permit implementation - described in the current MS4 Permits as a voluntary approach to compliance - is a departure from previous permit structures. The previous MS4 Permits (Order Nos. 01-182 and 99-060) addressed implementation through jurisdictional Stormwater Quality Management Programs (SQMPs). The Los Angeles countywide SQMP, prepared jointly by the Permittees and approved by the Regional Board in 2001, described the controls to be implemented in order to comply with the special provisions (now referred to as the Minimum Control Measures, or MCMs) of the MS4 Permit. These controls were identical for each Permittee and did not: 1) differentiate between watersheds or agencies or 2) target or identify priority pollutants.

The emphasis of the prior SQMP approach was rote program development and implementation. In contrast, management actions under the WMP are driven by the water quality conditions of the receiving waters and outfalls within the watershed.

The Regional Board outlines several reasons for this shift in emphasis from the prior MS4 permit. A watershed based structure for permit implementation is consistent with TMDLs developed by the Los Angeles Water Board and USEPA, which are established at a watershed or subwatershed scale and are a prominent part of the MS4 Permit. Many of the Permittees have already begun collaborating on a watershed scale to develop monitoring and implementation plans required by TMDLs.

[5] Including discharges subject to a decision document approved pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
[6] MS4 Permit Fact Sheet (pg. F7)

1.2.3 WATERSHED MANAGEMENT GOALS

Addressing MS4 discharges on a watershed scale focuses on water quality results by emphasizing the receiving waters and outfalls within the watershed[7]. The conditions of the receiving waters drive management actions, which in turn focus on the measures to address pollutant contributions from MS4 discharges.

The ultimate goals of the Watershed Management Programs is to ensure that discharges from the MS4:

1. Achieve applicable Water Quality Based Effluent Limitations (WQBELs) that implement TMDLs,
2. Do not cause or contribute to exceedances of receiving water limitations,
3. Non-stormwater discharges from the MS4 are not a source of pollutants to receiving waters.

1.2.4 WATERSHED MANAGEMENT APPROACH

In order to achieve the goals listed in the previous section, the approach of the WMP is to:

- Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters,
- Identify and implement strategies, control measures, and BMPs that:
    - Achieve applicable water quality-based effluent limitations[8]
    - Do not cause or contribute to exceedances of receiving water limitations[9]
    - Do not include non-stormwater discharges that are effectively prohibited[10]
    - Ensure that controls are implemented to reduce the discharge of pollutants to the maximum extent practicable[11]
- Execute an integrated monitoring program and assessment program[12] to determine progress towards achieving applicable limitations and/or action levels
- Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the Monitoring and Reporting Program (MRP) to ensure that applicable water quality-based effluent limitations and receiving water limitations and other milestones set forth in the WMP are achieved in the targeted timeframes.
- Provide opportunity for meaningful stakeholder input. This includes participation in a permit-wide WMP technical advisory committee (TAC) that advises and participates in the development of the WMP from month six through the date of program approval.

[7] MS4 compliance is measured at 1) Receiving water monitoring, 2) Stormwater outfall based monitoring, 3) Non-storm water outfall based monitoring, and 4) New Development/Re-development effectiveness tracking

[8] Pursuant to Part VI.E and Attachments L through R pursuant to corresponding compliance schedules

[9] Pursuant to Parts V.A and VI.E and Attachments L through R of the Permit

[10] Pursuant to Part III.A of the Permit

[11] Pursuant to Part IV.A.1 of the Permit

[12] Pursuant to Attachment E – MRP, Part IV of the Permit

The overall approach is adaptive, whereby BMPs will be implemented, their effectiveness monitored and modifications to this WMP will be made as needed. These modifications will maintain consistency with the assumptions and requirements of applicable TMDL Waste Load Allocations.

1.2.5 CALIFORNIA ENVIRONMENTAL QUALITY ACT

The goals and objectives of the WMP may be achieved by development of stormwater structural controls that may require discretionary approval subject to review under the California Environmental Quality Act (CEQA). The participating agencies intend to comply with CEQA when implementing structural BMPs. Public agencies responsible for carrying out or approving stormwater structural controls are identified as the lead agency. The environmental review required imposes both procedural and substantive requirements. At a minimum, the lead agency must adhere to the consultation and public notice requirements set forth in the CEQA Guidelines, make determinations whether the proposed stormwater treatment control is a "project", and if so, conduct an initial review of the project and its environmental effects. The lead agency must identify and document the potential environmental impacts of the proposed project in accordance with CEQA, (Public Resources Code Section 21000 et seq.), and the CEQA Guidelines (Title 14 of the California Code of Regulations, Section 15000, et seq.).

Certain classes of projects have been determined not to have significant effect on the environment and are exempt from the provisions of CEQA by statute or category. When a public agency decides that a project is exempt from CEQA, and the public agency approves or determines to carry out the project, the agency may file a Notice of Exemption. For projects deemed not exempt, the lead agency will prepare and Initial Study and decide whether a Negative Declaration will be required for the project, or depending on the potential effects, a further, and more substantial review may be conducted in the form of an Environmental Impact Report (EIR). A project may not be approved as submitted if feasible alternatives or Mitigation Measures are able to substantially lessen the significant environmental effects of the project. Moreover, environmental review must include provisions for wide public involvement, formal and informal, in order to receive and evaluate public reactions to environmental issues, and when deciding the matter, the lead agency must consider all comments it receives (Cal. Pub. Res. Code § 21091(d)(1); 14 CCR § 15074(b)). The lead agency will use the EIR in determining the environmental effects of the proposed storm water structural control project, and whether or not to approve the proposed project. If the proposed project is approved, all conditions and mitigations made in the adopted EIR will become part of any subsequent actions taken by the lead agency. The EIR will also be used by permitting agencies, funding agencies and the public to support proposed project decisions.

The National Environmental Quality Act (NEPA) comes into play less often than CEQA, but may be included for storm water treatment control projects involving federal funding. A joint NEPA and CEQA review process is encouraged to improve coordination and avoid redundancies. Like CEQA, NEPA process provides opportunities to address issues related to proposed projects early in the planning stages. NEPA was codified under Title 42 of the United States Code sections 4331 et seq. (42 U.S.C. 4331 et seq.).

1.3 LOWER SAN GABRIEL RIVER WATERSHED

1.3.1 OVERVIEW OF THE SAN GABRIEL RIVER WATERSHED

The San Gabriel River Watershed drains a watershed of 689 square miles. The main channel of the San Gabriel River is approximately 58 miles long. Its headwaters originate in the San Gabriel Mountains with the East, West, and North Forks. The river empties to the Pacific Ocean at the Los Angeles and Orange Counties boundary in Long Beach. The main tributaries of the river are Big and Little Dalton Wash, San Dimas Wash, Walnut Creek, San Jose Creek, Fullerton Creek, and Coyote Creek. Part of the Coyote Creek subwatershed is in Orange County and is under the authority of the Santa Ana Water Board. Land use in the watershed is diverse and ranges from predominantly open space in the upper watershed to urban land uses in the middle and lower parts of the watershed.

The remaining discussion on the watershed will solely refer to the specific characteristics of the Lower San Gabriel River Watershed.

1.3.2 LOWER SAN GABRIEL RIVER WATERSHED AREA

REGIONAL AND LOCAL SETTING

The Lower SGR Watershed encompasses an approximately 78.5 square miles (50,240 acres) within Los Angeles County and comprises 11.4% drainage area for the San Gabriel River Watershed. There are approximately 150 stream miles located in the watershed. The boundaries of the watershed are shown in Figure 1-1 and further explained in Section 1.1.

CLIMATE

Average annual precipitation for the watershed area is highly variable and terrain-dependent, averaging fifteen (15) inches annually and mainly occurring during the winter months (November through April). Due to the dominance of the stable marine layer, significant precipitation is rare between May and October.

During the winter months Pacific storms often push cold fronts across California from northwest to southeast. These storms and frontal systems account for the vast bulk of the area's annual rainfall. Such rainy season storms are migratory, with wet and dry periods alternating during the winter and early spring with irregularity in timing and duration. Rainfall patterns average 3.68 inches of rainfall in February to 0.01 inches of rainfall in July[13].

With the highly developed conditions within the watershed, most stormwater flows generated by the rainfall is routed to the ocean through the curb and gutters along the streets, catch basins and storm drains into the San Gabriel River. The velocity of the storm flows within this watershed ranges up to 20 feet per second within the waterways.

[13] National Climatic Data Center, http://lwf.ncdc.noaa.gov

RAINFALL AND FLOW CHARACTERISTICS

Historical rainfall records from 3 existing rain gauges located adjacent to the LSGR watershed were obtained and utilized in this analysis. These meteorological stations and resulting rain gauge data are maintained by National Climatic Data Center. The gauges were chosen due to their active status and the duration of available data. These locations are shown in Figure 1-5 with detailed location information provided in Table 1-3.

Table 1-3: Rainfall data summary

Station ID	Station	Period	Latitude	Longitude	Elevation (ft)	Mean Annual Precipitation (in)	85th Percentile Storm (in)
GHCND: USC00042494	Downey Fire Station	1949 - 2012	33.929	-118.145	110	12.32	0.22
GHCND: USW00023129	Long Beach Daugherty Field	1949 - 2014	33.811	-118.1463	30.84	11.20	0.18
GHCND: USC00049660	Whittier City Yard	1998 - 2014	33.9758	-118.0222	445.87	9.86	0.03

(1) National Climatic Data Center, http://lwf.ncdc.noaa.gov

Average monthly rainfall for the historical record has been calculated for each rain gauge and is provided in Table 1-3. The monthly values are similar among the two rain gauges.

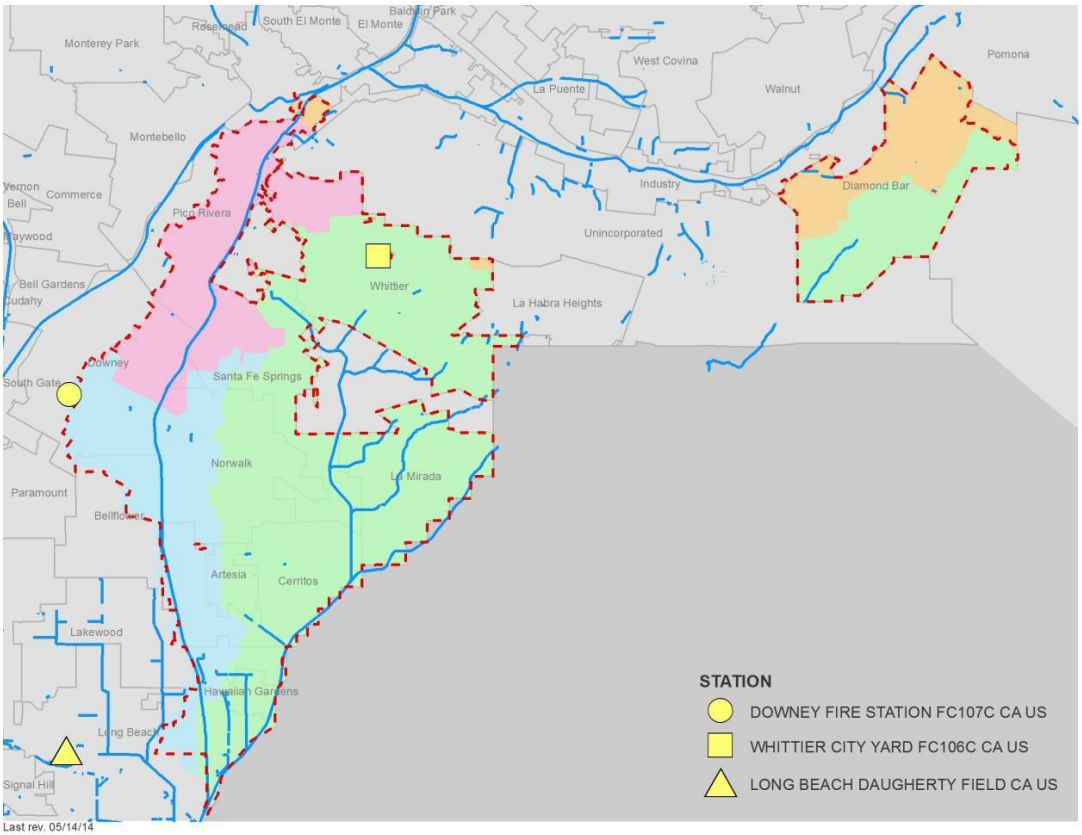

Figure 1-5: Rainfall gauge stations in Downey and Long Beach (yellow squares)

Table 1-4: Summary of average monthly rainfall (in)

Month	Downey Fire Station	Long Beach Daugherty Field	Whittier City Yard
January	3.3	2.8	2.8
February	3.3	3.6	3.7
March	2.4	2.2	2.2
April	1.0	0.6	0.7
May	0.3	0.3	0.3
June	0.1	0.2	0.1
July	0.0	0.0	0.0
August	0.1	0.1	0.1
September	0.3	0.3	0.3
October	0.4	0.4	0.4
November	1.5	1.0	0.9
December	2.0	2.0	2.0
Total Average Monthly Rainfall	1.2	1.1	1.1

(1) National Climatic Data Center, http://lwf.ncdc.noaa.govhttp://lwf.ncdc.noaa.gov/

DRY WEATHER FLOWS TO THE LOWER SAN GABRIEL RIVER

Dry weather flow in the San Gabriel River comes predominantly from effluent discharges and groundwater inflow. Sources of effluent discharges in the Lower San Gabriel River watershed include the Sanitation Districts of Los Angeles County, urban runoff such as irrigation overflows and car wash water, and various industrial discharges.

The Sanitation Districts of Los Angeles County maintain a regional, interconnected sewerage system called the Joint Outfall System. The Joint Outfall System includes five satellite water reclamation plants (WRPs) that discharge effluent into the San Gabriel River during dry weather:

THE LONG BEACH WRP is located at 7400 E. Willow Street in the City of Long Beach. The plant occupies 17 acres west of the San Gabriel River (605) Freeway and began operation in 1973. The Long Beach WRP provides primary, secondary and tertiary treatment for 25 million gallons of wastewater per day, and serves a population of approximately 250,000 people. Almost 6 million gallons per day of the reclaimed water is reused at over 60 reuse sites, including landscape irrigation of schools, golf courses, parks, and greenbelts by the City of Long Beach. The remaining water is discharged directly to Coyote Creek at one effluent discharge point directly above the confluence with the San Gabriel River. The average monthly effluent discharge from the Long Beach WRP was 11.97 MGD in 2012, with the average monthly max being 17.50 MGD and the average monthly minimum flows measured at 7.84 MGD.

THE LOS COYOTES WRP is located at 16515 Piuma Avenue in the city of Cerritos and occupies 34 acres at the northwest junction of the San Gabriel River (605) and the Artesia (91) Freeways. The Los Coyotes WRP provides primary, secondary and tertiary treatment for 37.5 million gallons of wastewater per day, and serves a population of approximately 370,000 people. Over 5 million gallons per day of the reclaimed water is reused at over 270 reuse sites, including landscape irrigation of schools, golf courses, parks, nurseries, and greenbelts. The remaining water is discharged directly to the San Gabriel River at one effluent discharge point above the confluence

with Coyote Creek. The average monthly effluent discharge from the Los Coyotes WRP was 18.85 MGD in 2012, with the average monthly max being 22.62 MGD and the average monthly minimum flows measured at 15.58 MGD.

THE POMONA WRP is located at 295 Humane Way in the City of Pomona. The plant occupies 14 acres northeast of the intersection of the Pomona (60) and Orange (57) Freeways. The Pomona WRP provides primary, secondary and tertiary treatment for 15 million gallons of wastewater per day, and serves a population of approximately 130,000 people. Approximately 8 million gallons per day of the reclaimed water is reused at over 190 different reuse sites, including landscape irrigation of parks, schools, golf courses, greenbelts. The remaining water is discharged to the San Jose Creek channel at 1 effluent discharge point, where it is allowed to percolate into the groundwater in the unlined portions of the San Gabriel River before flowing into the ocean. The average monthly effluent discharge from the Pomona WRP was 4.22 MGD in 2012, with the average monthly max being 7.42 MGD and the average monthly minimum flows measured at 2.09 MGD.

THE SAN JOSE CREEK WRP is located at 1965 Workman Mill Road, in unincorporated Los Angeles County, next to the City of Whittier. The plant occupies 39 acres north of the Pomona (60) Freeway on both sides of the San Gabriel (605) Freeway and consists of an East WRP and a West WRP. The San Jose Creek WRP provides primary, secondary and tertiary treatment for 100 million gallons of wastewater per day, and serves a large residential population of approximately one million people. Approximately 42 million gallons per day of the reclaimed water is reused at over 130 different reuse sites, including groundwater recharge and irrigation of parks, schools, and greenbelts. The remainder is discharged to the San Gabriel River at 5 discharge points. The average monthly effluent discharge from the East San Jose Creek WRP was 31.64 MGD in 2012, with the average monthly max being 44.34 MGD and the average monthly minimum flows measured at 9.03 MGD. The average monthly effluent discharge from the West San Jose Creek WRP was 9.65 MGD in 2012, with the average monthly max being 18.00 MGD and the average monthly minimum flows measured at 1.28 MGD.

THE WHITTIER NARROWS WRP is located at 301 N. Rosemead Boulevard in the City of El Monte. The plant occupies 27 acres south of the Pomona (60) Freeway, and provides primary, secondary and tertiary treatment for 15 million gallons of wastewater per day. Most of the reclaimed water is reused as groundwater recharge into the Rio Hondo and San Gabriel Coastal Spreading Grounds, or for irrigation at an adjacent nursery. Remaining effluent is discharged directly into the San Gabriel River at 1 effluent discharge point above Whittier Narrows Dam. The average monthly effluent discharge from the Whittier Narrows WRP was 6.44MGD in 2012, with the average monthly max being 8.05MGD and the average monthly minimum flows measured at 4.97MGD.

WET WEATHER FLOWS TO THE LOWER SAN GABRIEL RIVER

In addition to stormwater flows within the Los Angeles Basin, wet weather flows from the San Gabriel River Mountains also contribute to flows in the San Gabriel River.

WATERSHED CATCHMENT HYDROLOGIC CONNECTIVITY

The main reach through the watershed is the San Gabriel River, with Coyote Creek and San Jose Creek as major tributaries. The stretch of the San Gabriel River within the watershed consists of a concrete lined channel spanning 140 to 200 feet in width. Coyote Creek and San Jose Creek also have concrete channels at their confluence with the San Gabriel River. Figure 1-6 shows the LACFCD storm drain system within the LSGRW as well as its main channels and tributaries.

The Coyote Creek subwatershed drains approximately 185 square miles to its confluence with the San Gabriel River. The subwatershed is almost entirely developed.

The San Jose Creek subwatershed drains approximately 7.29 square miles to its confluence with the San Gabriel River.

The Lower SGR Watershed drains runoff directly from urbanized area totaling approximately 78.5 square miles. From its upstream beginning in Whittier (in Reach 3 of the San Gabriel River) to its downstream confluence with the San Gabriel River Estuary, the Lower SGR stretches approximately 17.1 miles. The Los Angeles County Department of Public Works provided the delineation of the catchments within each subwatershed. Approximately 107 catchments are located within this watershed[14]. These delineations are based on a combination of contour information and existing underground storm sewer systems.

Drainage areas for individual outfalls are not readily available at this time. Defining these areas would require significant resources. The Group proposes to provide drainages areas for major outfalls with significant discharges and outfalls to be monitored as part of the CIMP. To complete this task, existing drainage maps from the LACFD and/or cities will be obtained and converted to GIS project files. This task will be completed within one year of WMP approval.

The watershed is predominately served by storm drain systems, extending across 15 agency jurisdictions, connecting drainage in urbanized areas with the main tributaries. Although most agencies are not directly adjacent to the LSGR, their runoff ultimately reaches the SGR through its tributaries and connected storm sewer systems.

[14] Los Angeles County Watershed Management Modeling System, http://dpw.lacounty.gov/wmd/wmms/

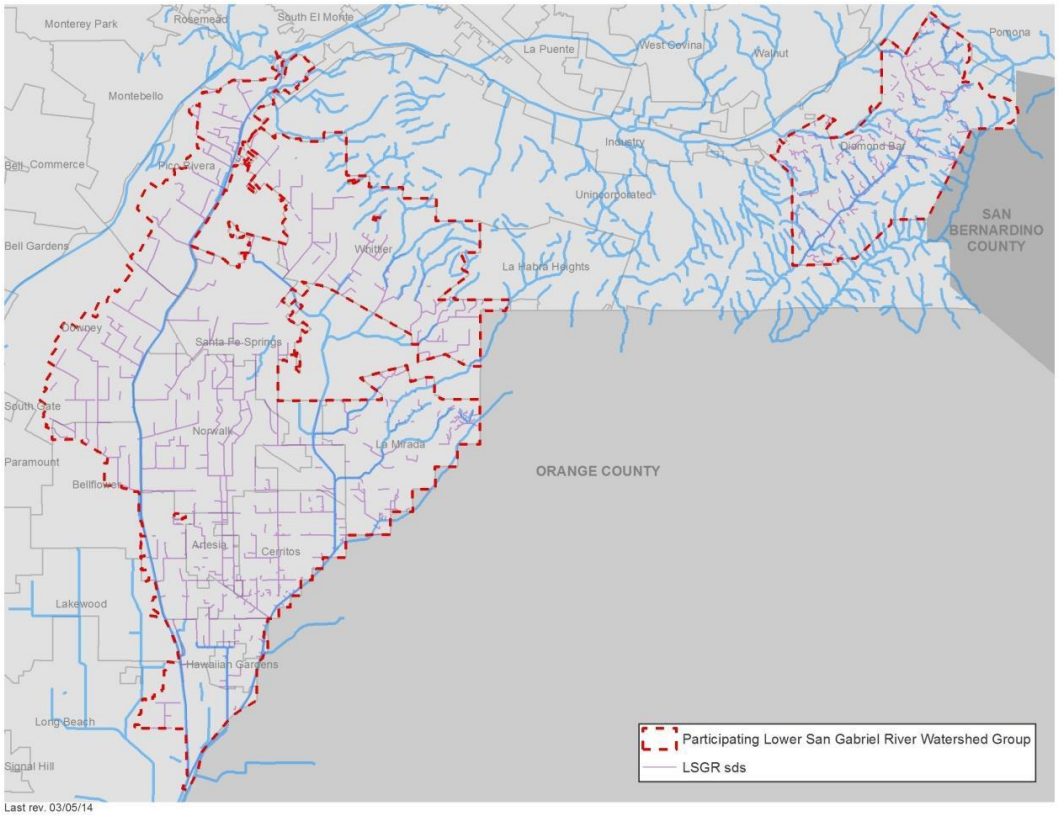

Figure 1-6: LACFCD storm drains

GEOPHYSICAL SETTING

TOPOGRAPHY

Natural topography is comprised of the existing soils, ground elevation/slope, vegetation, stream network, and groundwater. These features impact each other in both the natural and built environments, and therefore should not be analyzed independently when evaluating BMP location options.

SOILS

The Lower SGR Watershed can be characterized as having seven soil types. Figure 1-7 shows the various soil types underlying the watershed. Soils range from sandy loam to clay loam, having a varying range of saturated hydraulic conductivity.

GROUNDWATER

Groundwater flow in the Lower SGR Watershed generally mimics surface topography. Depth to the groundwater varies from 11 feet to greater than 40 feet. Figure 1-8 shows the groundwater basin for the Lower SGR Watershed.

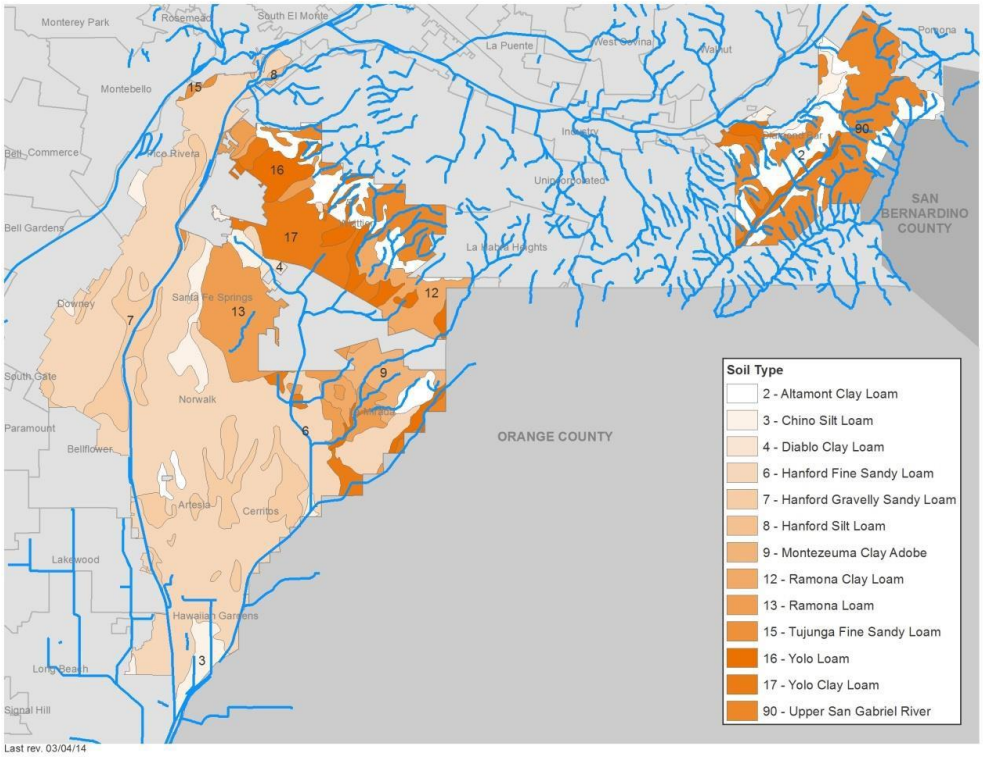

Figure 1-7: Soil types

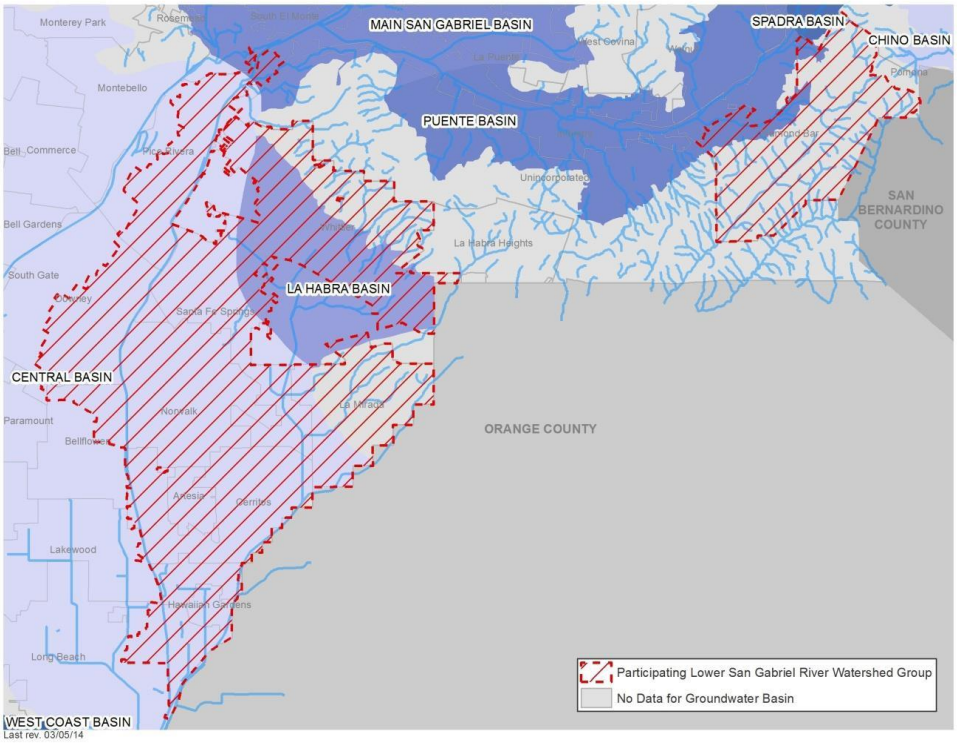

Figure 1-8: Groundwater basins

WATERSHED LAND AREA

Table 1-5 lists the percent land area within the Lower SGR for each participant. In addition to the areas listed in Table 1-5, the WMP will also cover the portions of the cities of Diamond Bar and Whittier do not drain to San Gabriel River Reach 1 and Reach 2 or Coyote Creek.

Table 1-5: Watershed land area

Permittee	Land Area (Acres)	Percent of Total Area
Artesia	1,037	2%
Bellflower	1,216	2%
Cerritos	5,645	11%
Diamond Bar	4,563	9%
Downey	4,237	8%
Hawaiian Gardens	614	1%
La Mirada	5,018	10%
Lakewood	1,293	3%
Long Beach	2,138	4%
Norwalk	6,246	11%
Pico Rivera	3,929	8%
Santa Fe Springs	5,683	11%
Whittier	9,382	16%
Caltrans	Caltrans owns and operates approximately 4% of the watershed	
LACFCD	N/A	N/A

LAND USES

Table 1-6 lists and Figure 1-9 shows the developed and undeveloped land within the Lower SGR Watershed.

Table 1-6: Developed and undeveloped land

Jurisdiction	Acres Developed	Acres Undeveloped	% Developed Lands
Artesia	1,053	15.90	99%
Bellflower	830	115	88%
Cerritos	4,600	250	95%
Diamond Bar	26,100	960	97%
Downey	4,090	166	96%
Hawaiian Gardens	1,650	2	100%
La Mirada	10,090	320	97%
LACFCD	ND	ND	ND
Lakewood	3,970	218	95%
Long Beach	4,330	700	86%
Norwalk	7,380	115	99%
Pico Rivera	3,770	283	93%
Santa Fe Springs	5,000	140	97%
Whittier	7,680	1,860	81%
Caltrans	ND	ND	ND

ND - Not delineated

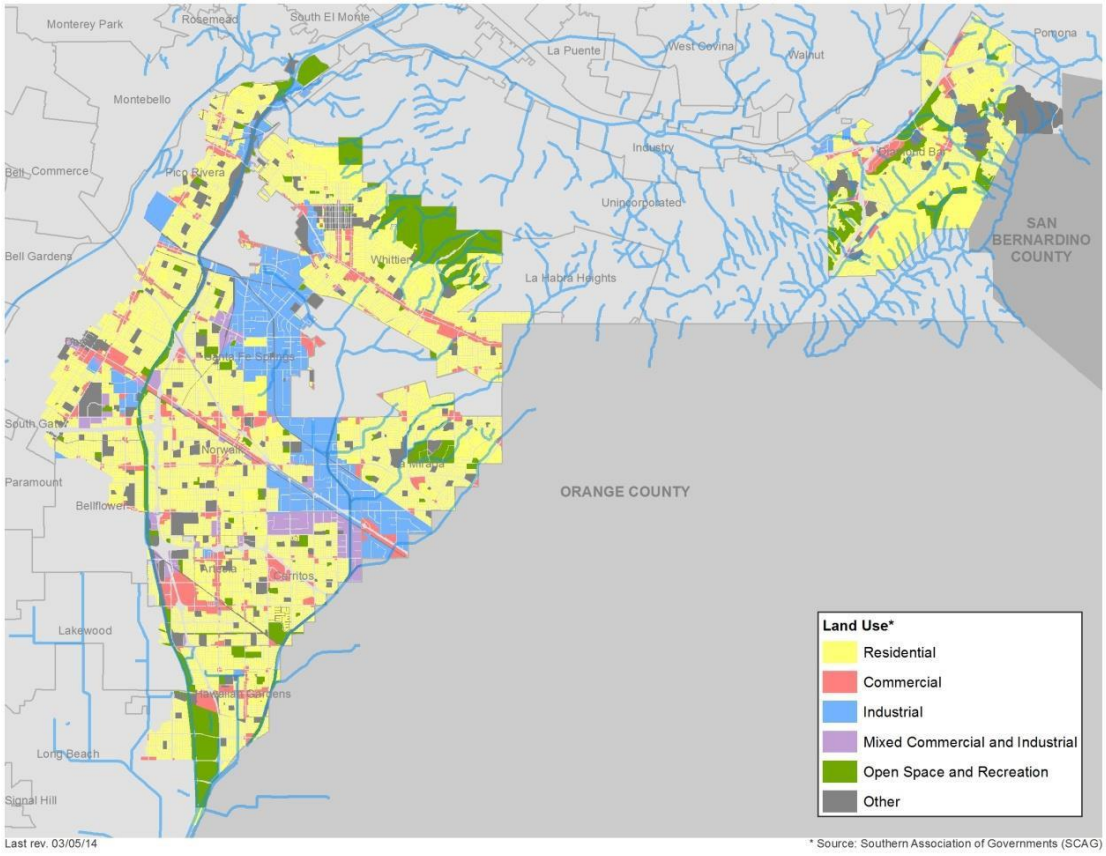

Figure 1-9: Land use map

DISADVANTAGED COMMUNITY

The Lower SGR Watershed is in a geographic area encompassing all or part of thirteen cities. This area is a high-minority and economically disadvantaged region. Of the thirteen cities participating in this WMP, twelve are categorized as disadvantaged communities in part (see Table 1-7)[15], meaning that the median income levels in the city as a whole are less than 80% of the state's median household income ($48,706).

[15] United States Census Bureau, as accessed at *http://www.census.gov/*. February 2014.

Table 1-7: Income statistics by City

City	DAC Percentage
Artesia	14%
Bellflower	30%
Cerritos	6%
Diamond Bar	0%
Downey	29%
Hawaiian Gardens	40%
La Mirada	7%
Lakewood	3%
Norwalk	23%
Pico Rivera	34%
Santa Fe Springs	80%
Whittier	16%
Long Beach	49%

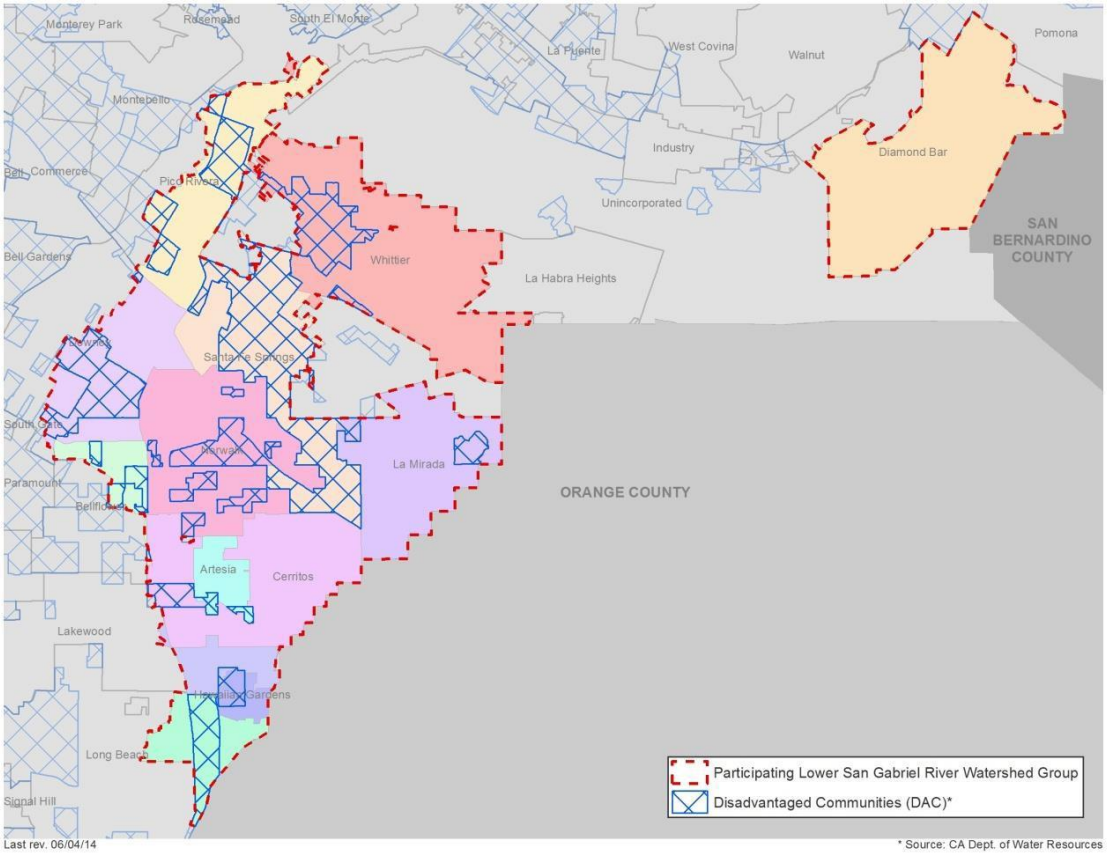

Figure 1-10: Disadvantage Community (DAC) map

1.4 WATER QUALITY IMPAIRMENTS

1.4.1 HISTORY OF IMPAIRMENTS IN THE LOWER SGR WATERSHED

Various reaches of the Lower SGR Watershed are on the 2010 CWA Section 303(d) List of impaired water bodies due to metals (copper, lead, selenium, and zinc). Segments of the San Gabriel River and its tributaries are listed as exceeding water quality objectives for copper, lead, selenium, and zinc. Metals loadings to San Gabriel River have the potential to cause impairments of the WILD, WARM, COLD, RARE, EST, MAR, MIGR, SPWN, WET, MUN, IND, AGR, GWR, and PROC beneficial uses. The San Gabriel River metals and selenium TMDL found that the MS4 contributes a large percentage of the metals loadings during dry weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. During wet weather, most of the metals loadings are in the particulate form and are associated with wet-weather stormwater flow.

1.4.2 ORGANIZING TO ADDRESS TMDLS

TMDLs represent large-scale efforts crossing jurisdictional boundaries and often encompassing the entire drainage of a major regional waterbody (e.g., San Gabriel River). These TMDLs involve coordinated participation from multiple agencies to address the impairments. Several agencies participating in the development of this WMP have already worked in a coordinated effort to address water quality issues throughout the San Gabriel River. This includes the Coyote Creek/San Gabriel River Metals TMDL Committee, which organized several cities under a Memorandum of Agreement in 2012 to develop an Implementation Plan for that TMDL. This effort has now been incorporated into this WMP approach in 2013 and development and adoption of a Basin Plan Amendment by the Regional Board in June 2013. Additional efforts included the cities of Downey, Norwalk, Pico Rivera, Santa Fe Springs and Whittier jointly applied for a Proposition 84 grant to install Low Impact Development (LID) BMPs along high traffic transportation corridors.

1.5 WATER QUALITY ISSUES AND THE HISTORY OF WATER QUALITY REGULATIONS

1.5.1 FEDERAL AND STATE LAW

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for all inland surface waters, estuaries, and coastal waters. The federal Environmental Protection Agency (EPA) is ultimately responsible for implementation of the CWA and its associated regulations. However, the CWA allowed EPA to authorize the NPDES Permit Program to state governments, enabling states to perform many of the permitting, administrative, and enforcement aspects of the NPDES Program. California, like other states, implements the CWA by promulgating its own water quality protection laws and regulations. As long as this authority provides equivalent protections as the federal CWA, EPA can delegate CWA

responsibilities to the state while retaining oversight responsibilities. In some cases, California has established requirements that are more stringent than federal requirements.

The 1970 Porter-Cologne Water Quality Control Act granted the California State Water Resources Control Board (SWRCB) and nine California Regional Water Quality Control Boards (Regional Boards) broad powers to protect water quality. This Act and its governing regulations provide the basis for California's implementation of CWA responsibilities. The Los Angeles Regional Water Quality Control Board (Regional Board) is the governing regulatory agency for the Lower SGR Watershed.

Section 303(d) of the CWA requires waterbodies not meeting water quality objectives even after all required effluent limitations have been implemented (e.g. through wastewater or stormwater discharge permits) to be regularly identified. These waters are often referred to as "303(d) listed" or "impaired" waters. Waterbodies that are listed on the 303(d) list typically require development of a Total Maximum Daily Load (TMDL) for the pollutant(s) impairing the use of the water. Development and approval of the 303(d) list is a lengthy state and federal process. A list is not effective until the EPA approves the list. The current EPA-approved 303(d) list for California is the 2010 list; this list can be found in APPENDIX X.

A TMDL establishes the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. Depending on the nature of the pollutant, TMDL implementation requires limits on the contributions of pollutants from point sources (waste load allocation), nonpoint sources (load allocation), or both. The Regional Board is responsible for TMDL development in the LSGRW.

Adoption of a TMDL requires an amendment to the Water Quality Control Plan (known as the Basin Plan) for the Los Angeles Region. The Regional Board's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of regional waters. Specifically, the Basin Plan (i) designates beneficial uses for surface and ground waters, (ii) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy, and (iii) describes implementation programs to protect all waters in the Region. The Basin Plan is reviewed and updated as necessary (Regional Board 1994, as amended). Following adoption by the Regional Board, the Basin Plan and subsequent amendments are subject to approval by the State Board, the State Office of Administrative Law (OAL), and the Environmental Protection Agency (EPA).

1.5.2 WATER QUALITY REQUIREMENTS

The Regional Board designates "beneficial uses" for waterbodies in the watersheds that it governs and adopts water quality objectives to protect these uses[16]. In some cases, EPA may also promulgate objectives where it makes a finding that the state's objectives are not protective enough to protect the beneficial use. The nature of the objectives is directly related to the type of beneficial use. For example, the freshwater warm habitat beneficial use protects aquatic organisms resident in warm-water streams. The associated water quality objectives are for those constituents known to affect both the growth and reproduction of aquatic life. These objectives range from physical characteristics such as temperature,

[16] See Regional Board's 1994 Los Angeles Region Basin Plan, as amended.

dissolved oxygen, and pH to potential toxic constituents including metals and organics. In California, the objectives for metals and a number of organic compounds have been established by the federal EPA rather than the state (California Toxics Rule, 2000). The EPA promulgated numeric water quality criteria for priority toxic pollutants and other water quality standards provisions based on the determination that the numeric criteria were necessary (since the state had been without numeric water quality criteria for many priority toxic pollutants as required by the CWA) to protect human health and the environment. These Federal criteria are legally applicable in the state for inland surface waters, enclosed bays and estuaries for all purposes and programs under the CWA.

1.6 MS4 PERMIT REQUIREMENTS

The development of this WMP is a compliance option of the MS4 Permit held by the Permittees[17]. The WMP includes an evaluation of existing water quality conditions, including characterization of stormwater and non-stormwater discharges from the MS4 and receiving water quality to support identification and prioritization/sequencing of management actions. At a minimum, water quality priorities within each Watershed Management Area must include achieving applicable water quality based effluent limitations and/or receiving water limitations established.

The MS4 permit requires that this WMP identify strategies, control measures, and BMPs to implement through the stormwater management programs on a watershed scale, with the goal of creating an efficient program to focus collective resources on watershed priorities and effectively eliminate the source of pollutants. This WMP has identified strategies, control measures, and BMPs to be implemented on a watershed scale. Customization of the BMPs to be implemented, or required to be implemented, has been done with the goal of creating an efficient program to focus individual and collective resources on watershed priorities.

On the basis of the evaluation of existing water quality conditions, water body-pollutant combinations were classified into one of the following three categories:

- CATEGORY 1 (HIGHEST PRIORITY): Waterbody-pollutant combinations for which water quality based effluent limitations and/or receiving water limitations are included in the MS4 permit to implement TMDLs.

[17] The Cities of Pico Rivera, Downey, Norwalk, La Mirada and Artesia (hereinafter "the Cities") submitted Administrative Petitions (Petitions) to the California State Water Resources Control Board (SWRCB) pursuant to section 13320(a) of the California Water Code requesting that the SWRCB review various terms and requirements set forth in the 2012 MS4 Permit, Order No. R4-2012-0175 (2012 Permit) adopted by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board)." These Cities have participated in good faith in the development of this Lower San Gabriel River Watershed Management Program (WMP). Nothing in this WMP shall affect those cities' administrative petitions, nor shall anything in this WMP constitute a waiver of any positions or rights therein.

- CATEGORY 2 (HIGH PRIORITY): Pollutants for which data indicate water quality impairment in the receiving water according to the State's Listing Policy and for which MS4 discharges may be causing or contributing to the impairment.
- CATEGORY 3 (MEDIUM PRIORITY): Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in the MS4 permit and for which MS4 discharges may be causing or contributing to the exceedance.

Sources for the waterbody-pollutant combinations are identified by considering the following:

- Review of available data, including historical findings from the participating agencies' Minimum Control Measure and TMDL programs, watershed model results and other pertinent information, data or studies.
- Locations of major MS4 outfalls and major structural controls for stormwater and nonstormwater that discharge to receiving waters.
- Other known and suspected sources of pollutants from the MS4 to receiving waters.

Based on the findings of the source assessment, the issues within the watershed are prioritized and sequenced. Factors considered in establishing watershed priorities include:

1. Pollutants for which there are water quality based effluent limitations and/or receiving water limitations with interim or final compliance deadlines within the permit term.
2. Pollutants for which there are water quality based effluent limitations and/or receiving water limitations with interim or final compliance deadlines between October 26, 2012 and October 25, 2017.
3. Pollutants for which data indicate impairment in the receiving water and the findings from the source assessment implicates discharges from the MS4, but no TMDL has been developed.

1.6.1 REASONABLE ASSURANCE ANALYSIS AND WATERSHED CONTROL MEASURES

As part of the WMP plan, a Reasonable Assurance Analysis (RAA) is conducted for each waterbody-pollutant combination. The RAA consists of an assessment, through quantitative analysis or modeling, to demonstrate that the activities and control measures (i.e. BMPs) identified in the Watershed Control Measures section of the WMP are performed to demonstrate that applicable water quality based effluent limitations and/or receiving water limitations with compliance deadlines during the permit term will be achieved. Watershed Control Measures are subdivided into 1) Minimum Control Measures, 2) Non-Stormwater Discharge Measures 3) TMDL Control Measures and 4) other control measures for water-body pollutant Categories 1, 2 and 3.

Schedules are developed for strategies, control measures and BMPs to be implemented by each individual Permittee within its jurisdiction and for those that will be implemented by multiple

Permittees on a watershed scale. The schedule will measure progress and incorporate 1) Compliance deadlines occurring within the permit term for all applicable interim and/or final water quality based effluent limitations and/or receiving water limitations to implement TMDLs, 2) Interim deadlines and numeric milestones within the permit term for any applicable final water quality based effluent limitation and/or receiving water limitation to implement TMDLs, where deadlines within the permit term were not otherwise specified, and 3) For watershed priorities related to addressing exceedances of receiving water limitations.

1.6.2 ADAPTIVE MANAGEMENT

An adaptive management process will be implemented every two years from the date of program approval, adapting the WMP to become more effective, based on, but not limited to the following:

1. Progress toward achieving the outcome of improved water quality in MS4 discharges and receiving waters through implementation of the watershed control measures,
2. Progress toward achieving interim and/or final water quality based effluent limitations and/or receiving water limitations, or other numeric milestones where specified, according to established compliance schedules,
3. Re-evaluation of the highest water quality priorities identified for the Watershed Management Area based on more recent water quality data for discharges from the MS4 and the receiving water(s) and a reassessment of sources of pollutants in MS4 discharges,
4. Availability of new information and data from sources other than the Permittees' monitoring program(s) within the Watershed Management Area that informs the effectiveness of the actions implemented by the Permittees,
5. Regional Water Board recommendations; and
6. Recommendations for modifications to the WMP solicited through a public participation process

Based on the results of the iterative process, modifications necessary to improve the effectiveness of the WMP will be reported in the Annual Report, and as part of the Report of Waste Discharge (ROWD). Any necessary modifications to the WMP will be implemented upon acceptance by the Regional Water Board Executive Officer or within 60 days of submittal if the Regional Water Board Executive Officer expresses no objections.

2 IDENTIFICATION OF WATER QUALITY PRIORITIES

2.1 WATERBODY POLLUTANT CLASSIFICATION

One of the goals of this Watershed Management Program (WMP) is to identify and address water quality priorities within the Lower San Gabriel River Watershed (Lower SGR Watershed). In order to begin prioritizing water quality issues within the Lower SGR Watershed, an evaluation of existing water quality conditions, including characterization of stormwater and nonstormwater discharges from the Municipal Separate Storm Sewer System (MS4) and receiving waters has been completed per section VI.C.5.a the MS4 Permit.

The existing water quality conditions of the Lower SGR Watershed were used to classify pollutants into three categories each with specific subcategories. These categories outline watershed priorities, which include, at a minimum, achieving applicable water quality-based effluent limitations and/or receiving water limitations established pursuant to TMDLs. The categories and subcategories are described below:

- Category 1: Waterbody-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E TMDL Provisions and Attachments L through R of the MS4 Permit.
    - Category 1A: **Final** deadlines within permit term (after approval of WMP[1] & prior to December 28, 2017)
    - Category 1B: **Interim** deadlines within permit term (after approval of WMP[2] & prior to December 28, 2017)
    - Category 1C: **Final** deadlines between December 29, 2017 - December 28, 2022
    - Category 1D: **Interim** deadlines between December 29, 2017 - December 28, 2022
    - Category 1E: **Interim & final** deadlines after December 28, 2022
    - Category 1F: **Past final** deadlines (final deadlines due prior to approval of WMP)
- Category 2: Pollutants for which data indicate water quality impairment in the receiving water according to the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment.
    - Category 2A: Non-legacy pollutants
    - Category 2B: Bacterial indicators
    - Category 2C: Legacy pollutants
    - Category 2D: Water quality indicators
- Category 3: Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in this Order and for which MS4 discharges may be causing or contributing to the exceedance.

[1] Upon approval and no later than April 28, 2015.

[2] *Ibid.*

- Category 3A: Non-legacy pollutants
- Category 3B: Bacterial indicators
- Category 3C: Legacy pollutants
- Category 3D: Water quality indicators

The Lower SGR Watershed encompasses Reaches 1, 2, and 3 of the San Gabriel River, Coyote Creek, and the lower portions of the San Jose Creek (SJC Reach 1)[3]. A small portion of the watershed in the Diamond Bar area drains primarily through natural drainage to Chino Creek and the jurisdiction of the Santa Ana Region (Region 8). This area will be addressed through watershed control measures discussed in later chapters of this WMP. The pollutants for which the Lower SGR Watershed is listed as impaired for are shown on Figure 2-1.

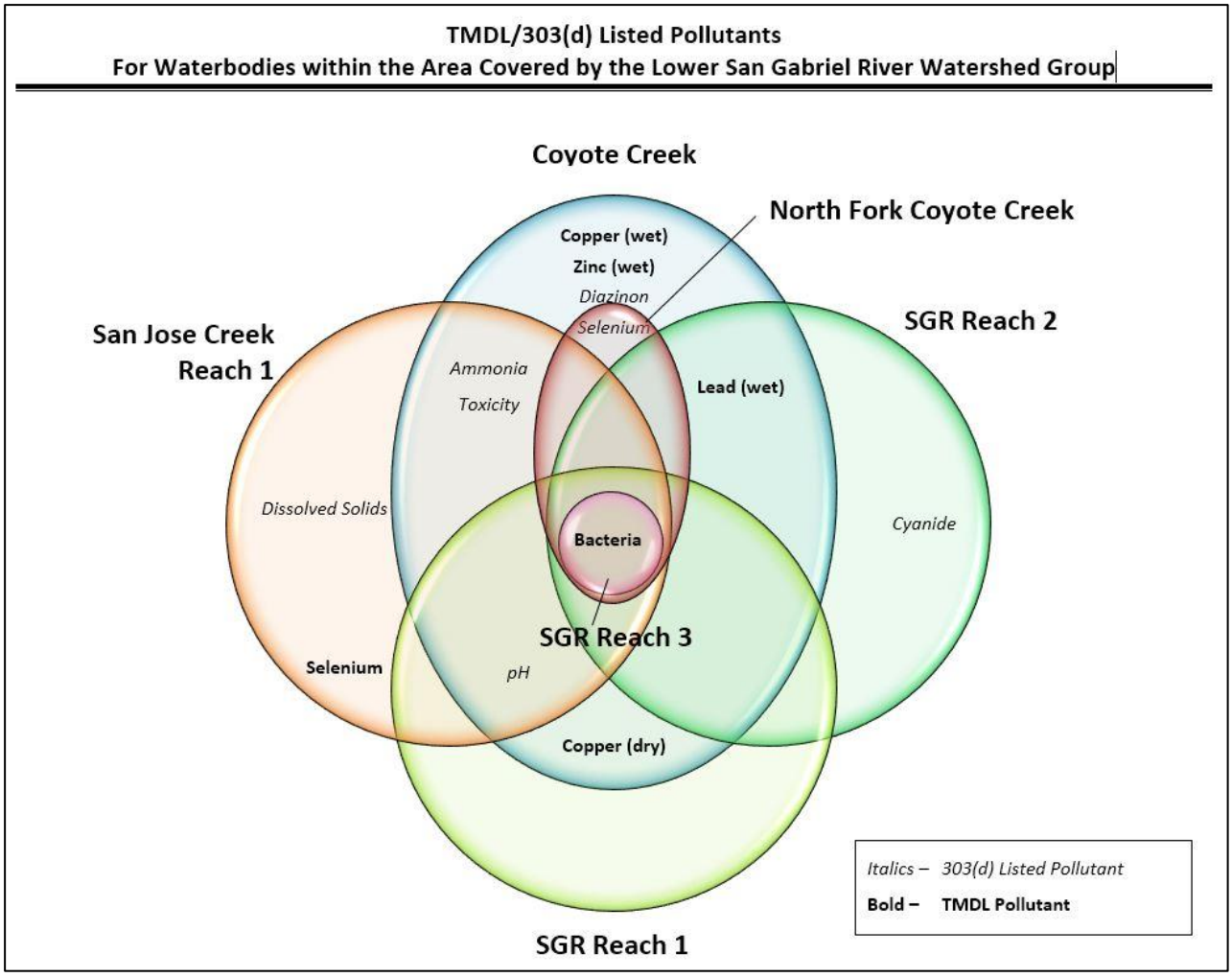

Figure 2-1: Lower San Gabriel River Watershed pollutant Venn diagram

[3] The USGS Hydrologic Unit Code Equivalent HUC boundaries created by LACFCD included the City of Diamond Bar in the Upper SJC HUC (180701060501); however, this designation does not coincide with the LA Basin Plan Reach designations that commence the Upper SJC (Reach 2) at Temple Avenue in Pomona. According to this designation, Diamond Bar drains solely to SJC Reach 1.

The pollutant categories are summarized below including the weather condition for which impairment was determined:

CATEGORY 1 B

- ***Copper*** *– San Gabriel River Reach 1 (Dry), Coyote Creek (Wet & Dry), North Fork Coyote Creek (Wet)*
- ***Lead*** *– San Gabriel River Reach 2 (Wet), Coyote Creek (Wet), San Jose Creek Reach 1 (Wet), North Fork Coyote Creek (Wet)*
- ***Zinc*** *– Coyote Creek (Wet), North Fork Coyote Creek (Wet)*
- ***Selenium*** *– San Jose Creek Reach 1 (Dry)*
- ***Bacteria*** *– San Gabriel River Reach 1 (Wet & Dry), San Gabriel River Reach 2 (Wet & Dry), San Gabriel River Reach 3 (Wet & Dry),Coyote Creek (Wet & Dry), North Fork Coyote Creek (Wet & Dry), San Jose Creek Reach 1 (Wet & Dry)*

CATEGORY 2A

- ***Ammonia*** *– Coyote Creek (Wet & Dry), San Jose Creek Reach 1 (Wet & Dry)*
- ***Cyanide*** *– Coyote Creek (Wet & Dry), San Gabriel River Reach 2 (Wet & Dry)*
- ***Diazinon*** *– Coyote Creek (Wet & Dry)*
- ***PAHs*** *– San Gabriel River Reach 2 (Wet & Dry), San Jose Creek Reach 1 (Wet and Dry)*

CATEGORY 2C

- ***Copper*** *– San Gabriel River Reach 2 (Wet & Dry), San Jose Creek Reach 1 (Wet & Dry)*
- ***Lead*** *– Coyote Creek (Dry)*
- ***Mercury*** *– North Fork Coyote Creek (Wet & Dry)*
- ***Nickel*** *– Coyote Creek (Dry)*
- ***Selenium*** *– North Fork Coyote Creek (Wet & Dry)*
- ***Zinc*** *–San Gabriel River Reach 2 (Wet & Dry), San Jose Creek Reach 1 (Wet & Dry), Coyote Creek (Dry)*

CATEGORY 2D

- ***Chloride*** *– San Jose Creek Reach 1 (Dry)*
- ***pH*** *– San Gabriel River Reach 1 (Wet & Dry), Coyote Creek (Wet & Dry), San Jose Creek Reach 1 (Wet & Dry)*
- ***Total Dissolved Solids*** *– San Jose Creek Reach 1 (Dry)*
- ***Toxicity*** *– Coyote Creek (Wet & Dry), San Jose Creek Reach 1 (Wet & Dry)*

CATEGORY 3A

- ***Cyanide*** *– North Fork Coyote Creek (Wet and Dry), San Jose Creek Reach 1 (Wet and Dry)*
- ***Chloride*** *– San Gabriel River Reach 2 (Dry), Coyote Creek (Dry), San Jose Creek Reach 1 (Dry)*
- ***Lindane*** *– San Gabriel River Reach 2 (Wet and Dry)*

- ***Sulfate*** *– San Gabriel River Reach 2 (Dry)[4], San Jose Creek Reach 1(Dry)*

CATEGORY 3C

- ***Alpha-Endosulfan*** *– Coyote Creek (Dry)[5]*
- ***Copper*** *– North Fork Coyote Creek (Dry)*
- ***Selenium*** *– San Gabriel River Reach 1 (Dry)*

CATEGORY 3D

- ***Dissolved Oxygen*** *– San Gabriel River Reach 1 (Dry),San Gabriel River Reach 2 (Wet and Dry), Coyote Creek (Wet)[6], San Jose Creek Reach 1 (Wet & Dry)*
- ***MBAS*** *– Coyote Creek (Wet), San Gabriel River Reach 2 (Wet)*
- ***pH*** *–North Fork Coyote Creek (Dry)*
- ***Total Dissolved Solids*** *– San Gabriel River Reach 2 (Dry)*

Tables 2-1 and 2-2 summarize the waterbody pollutant combinations for the Lower SGR Watershed.

Table 2-1: Wet weather waterbody/pollutant categories

Category	Analyte	SGR1[(a)]	SGR2[(b)]	SGR3[(c)]	SJC1[(d)]	CC[(e)]	NFC[(f)]
1	Copper					×	×
	E. coli	×	×	×	×	×	×
	Lead		×		×	×	×
	Zinc					×	×
2	Ammonia				×	×	
	Copper		×		×		
	Cyanide		×			×	
	Diazinon					×	
	Mercury						×
	PAH		×		×		
	pH	×			×	×	
	Selenium						×
	Toxicity				×	×	
	Zinc		×		×		
3	Cyanide				×		×
	Dissolved Oxygen		×		×	×	
	Lindane		×				
	MBAS		×			×	
	Selenium	×					

[(a)]San Gabriel River Reach 1, [(b)]San Gabriel River Reach 2, [(c)]San Gabriel River Reach 3, [(d)]San Jose Creek Reach 1, [(e)]Coyote Creek, [(f)]North Fork Coyote Creek

[4] This waterbody/pollutant combination was added due to one exceedance occurring during the 09-10 storm year. There have been no exceedances detected since this time.

[5] This waterbody/pollutant combination was added due to one exceedance occurring during the 09-10 storm year. There have been no exceedances detected since this time.

[6] This waterbody/pollutant combination was added due to one exceedance occurring during the 03-04 storm year. There have been no exceedances detected since this time.

Table 2-2: Dry weather waterbody/pollutant categories

Category	Analyte	SGR1[a]	SGR2[b]	SGR3[c]	SJC1[d]	CC[e]	NFC[f]
1	Copper	X				X	
	E. coli	X	X	X	X	X	X
	Selenium				X		
2	Ammonia				X	X	
	Chloride				X		
	Copper		X		X		
	Cyanide		X			X	
	Diazinon					X	
	Lead					X	
	Mercury						X
	Nickel					X	
	PAH		X		X		
	pH	X			X	X	
	Selenium						X
	TDS				X		
	Toxicity				X	X	
	Zinc		X		X	X	
3	Alpha-endosulfan					X	
	Chloride		X		X	X	
	Copper						X
	Cyanide				X		X
	Dissolved Oxygen	X	X		X		
	Lindane		X				
	pH						X
	Selenium	X					
	Sulfate		X		X		
	TDS		X				

[a]San Gabriel River Reach 1, [b]San Gabriel River Reach 2, [c]San Gabriel River Reach 3, [d] San Jose Creek Reach 1, [e]Coyote Creek, [f]North Fork Coyote Creek

2.1.1 CATEGORY 1 POLLUTANTS

METALS (COPPER, LEAD, & ZINC), SELENIUM AND BACTERIA

Copper (for San Gabriel River Reach 1 and Coyote Creek), lead (for San Gabriel River Reach 2, Coyote Creek, and San Jose Creek Reach 1), zinc (for Coyote Creek), and selenium (for San Jose Creek Reach 1) are classified as a Category 1B pollutants. The indicator bacteria – *E. coli* is also classified as a Category 1B pollutant for the San Gabriel River and all tributaries (San Gabriel River Reach 1,2, Coyote Creek, North Fork Coyote Creek and San Jose Creek Reach 1,2).These waterbody-pollutant combinations are addressed in the USEPA established San Gabriel River and Impaired Tributaries Metals and Selenium TMDL and the San Gabriel River, Estuary and Tributaries Indicator Bacteria TMDL that was in effect starting June 14, 2016. Implementation of the TMDLs to achieve applicable receiving water limitations for these pollutants is discussed in later chapters of this WMP. Table 2-3 lists the TMDL targets.

Table 2-3: TMDL Targets for Category 1 Pollutants

Weather	Waterbody	Pollutant	Target	Source
Wet	San Gabriel River Reach 1, 2, 3	*E-coli*	235 MPN/100 mL	WQBEL
	San Gabriel River Reach 2	Pb	81.34 ug/L	WQBEL
	San Jose Creek Reach 1	*E-coli*	235 MPN/100 mL	WQBEL
	Coyote Creek	Cu	24.71 ug/L	WQBEL
	Coyote Creek	Pb	96.99 ug/L	WQBEL
	Coyote Creek	Zn	144.57 ug/L	WQBEL
	Coyote Creek	*E-coli*	235 MPN/100 mL	WQBEL
	North Fork Coyote Creek	*E-coli*	235 MPN/100 mL	WQBEL
Dry	San Gabriel River Reach 1	Cu	18 ug/L	WQBEL
	San Gabriel River Reach 1, 2, 3	*E-coli*	235 MPN/100 mL	WQBEL
	San Jose Creek Reach 1	Se	5 ug/L	WQBEL
	San Jose Creek Reach 1	*E-coli*	235 MPN/100 mL	WQBEL
	Coyote Creek	Cu	0.941 kg/d	WQBEL
	Coyote Creek	*E-coli*	235 MPN/100 mL	WQBEL
	North Fork Coyote Creek	*E-coli*	235 MPN/100 mL	WQBEL

2.1.2 CATEGORY 2 POLLUTANTS

The following pollutants have been categorized as Category 2 because data indicate water quality impairment due to these constituents according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy)[7]. This section concludes with Table 2-4, a summary of the applicable Water Quality Objectives (WQOs) for these pollutants.

AMMONIA[8]

Ammonia is a nutrient which is harmful in high levels. The 303(d) List has indicated that the San Jose Creek Reach 1 and Coyote Creek are impaired by ammonia; therefore, ammonia is classified as a Category 2A pollutant for San Jose Creek Reach 1 and Coyote Creek.

According to the California 2010 Integrated Report, ammonia was considered for removal from the 303(d) list for Coyote Creek and San Gabriel River Reach 1; however, it was concluded that the pollutant should not be removed from the 303(d) list because applicable water quality standards for the pollutant are being exceeded.

[7] An excerpt of the 2010 California 303(d) List of Water Quality Limited Segments for Region 4 is included in Appendix 2-1

[8] According to the Council for Watershed Health's State of the San Gabriel River watershed, over the last 10 years, upgrades to water reclamation plant (WRP) technologies has resulted in significant decreases in nitrogen compounds (such as ammonia) in receiving waters.

CHLORIDE

LACSD data detected 26 out of 108 dry weather exceedances at C1, 22 out of 108 dry weather exceedances at C2, and 21 out of 102 dry weather exceedances at RD in of the LA Basin Plan WQO for chloride between 2004 and 2012. These stations all correspond to Coyote Creek. Since the number of exceedances meets the State Listing Criteria for 303(d) listing[10] chloride is classified as a Category 2D pollutant in Coyote Creek.

COPPER

LACFCD mass emission station S(14) San Gabriel River detected 23 out of 38 wet weather exceedances and 14 out of 21 dry weather exceedances, and LACFCD Tributary Station TS(17) North Fork Coyote Creek detected 9 out of 10 wet weather exceedances and TS(15) Upper San Jose Creek detected 9 out of 10 wet weather and 4 out of 4 dry weather exceedances of the CTR WQO for copper between 2002 and 2012. Since this meets the State Listing Criteria for 303(d) listing[11] Copper is classified as a Category 2C pollutant in San Gabriel River Reach 2, North Fork Coyote Creek and San Jose Creek Reach 1.

CYANIDE

Cyanide is an inorganic chemical compound. The 303(d) List has indicated that San Gabriel River Reach 2 is impaired by cyanide. In addition, there were 4 out of 40 wet weather and 22 out of 23 dry weather exceedances of the CTR water quality objective for cyanide at Coyote Creek between 2002 and 2012[12]. Since this meets the State Listing Criteria for 303(d) listing[13], cyanide is classified as a Category 2A pollutant for the Reach 2 of the San Gabriel River and Coyote Creek.

DIAZINON

Diazinon is an organophosphate insecticide. The 303(d) List has indicated that Coyote Creek is impaired by diazinon; therefore, diazinon is classified as a Category 2A pollutant for the Reach 1 of Coyote Creek.

According to the California 2010 Integrated Report, diazinon was considered for removal from the 303(d) list for Coyote Creek; however, it was concluded that the pollutant should not be removed from the 303(d) list because applicable water quality standards are exceeded and diazinon contributes to or causes the problem.

[10] According to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Conventionals – Table 3.2.

[11] According to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Toxicants – Table 3.1.

[12] According to the California 2010 Integrated Report, cyanide was considered for placement onto 303(d) list for Coyote Creek; however, it was concluded that the pollutant should not be placed on the 303(d) list for Coyote Creek because applicable water quality standards for the pollutant are not being exceeded.

[13] According to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Toxicants – Table 3.1.

LEAD

Lead is classified as a Category 1B pollutant for San Gabriel River Reach 2, Coyote Creek, and San Jose Creek Reach 1 during wet weather as it is to be addressed by the USEPA established San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL; however, waste load allocations (WLAs) are not provided during dry weather.

Although Coyote Creek does not have an established dry weather WLA within the San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL, data indicates that Coyote Creek is impaired by lead in dry weather. LACFCD Mass Emission Station S(13) detected 9 out of 23 dry weather exceedances of the CTR water quality objective for lead between 2002 and 2012. Therefore, lead is classified as a Category 2C pollutant for Coyote Creek.

MERCURY

Although the waterbodies within the Lower SGR Watershed are not listed as impaired by mercury, the LACFCD Tributary station TS(17) North Fork Coyote Creek collected 1 out of 4 wet weather samples and 2 out of 10 dry weather samples exceeding the California Toxics Rule WQO for this pollutant between 2002 and 2012. Since this meets the State Listing Criteria for 303(d) listing[14], mercury is classified a category 2C pollutant within this WMP. It is anticipated that the control measures used to address the pollutants within San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL will subsequently address mercury; however, if exceedances occur and the implemented or proposed control measures do not address mercury, the Lower SGR WMP will be revised to include control measures to address the pollutant directly.

NICKEL

LACSD data detected 58 out of 85 dry weather exceedances of the CTR WQO for nickel in the Coyote Creek between 2004 and 2012. Since this meets the State Listing Criteria for 303(d) listing[15] nickel is classified as a Category 2C pollutant in Coyote Creek.

PAHS

Although the San Gabriel River and San Jose Creek are not listed as impaired on the 303(d) List for PAHs, monitoring data from the LA County Sanitation Districts (LACSD) indicate numerous exceedances of PAH compounds in the San Gabriel River and San Jose Creek from 2004-2012. Therefore, PAHs are classified as a Category 2A pollutant for San Gabriel River Reach 2 and San Jose Creek Reach 1.

PH

pH is a measure of the acidity or basicity of an aqueous solution. The 303(d) List has indicated that San Gabriel River Reach 1, Coyote Creek, and San Jose Creek Reach 1 are impaired by pH; therefore, pH is

[14] According to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Toxicants – Table 3.1.

[15] According to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Toxicants – Table 3.1.

classified as a Category 2D for Reach 1 of the San Gabriel River, Coyote Creek, and Reach 1 of the San Jose Creek.

According to the California 2010 Integrated Report, pH was considered for removal from the 303(d) list for Coyote Creek and San Gabriel River Reach 1; however, it was concluded that the pollutant should not be removed from the 303(d) list because applicable water quality standards for the pollutant are being exceeded.

SELENIUM

Selenium is classified as a Category 1C pollutant for San Jose Creek Reaches 1 and 2 as it is to be addressed by the USEPA established San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL; however, waste load allocations (WLAs) are not provided for Reaches 1, 2, or 3 of the San Gabriel River or for Coyote Creek.

Although Coyote Creek does not have an established WLA within the San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL, the 303(d) List has indicated that North Fork Coyote Creek is impaired by selenium[16]. Therefore, selenium is classified as a Category 2C pollutant for Coyote Creek.

TOTAL DISSOLVED SOLIDS

Total Dissolved Solids (TDS) is a measure of the combined content of all inorganic and organic substances contained in a liquid. The 303(d) List has indicated that the San Jose Creek Reach 1 is impaired by TDS; therefore, TDS is classified as a Category 2D for San Jose Creek Reach 1.

TOXICITY

The 303(d) List has indicated that Coyote Creek and San Jose Creek Reach 1 are impaired by toxicity; therefore, toxicity is classified as a Category 2D for Coyote Creek and Reach 1 of the San Jose Creek.

According to the California 2010 Integrated Report, San Gabriel River Reaches 1 and 3 were originally listed on the 303(d) list for toxicity and were removed based on the conclusion that applicable water quality standards are not being exceeded.

ZINC

LACFCD mass emission station S(13) Coyote Creek detected 5 out of 23 dry weather exceedances, LACFCD mass emission station S(14) San Gabriel River detected 27 out of 38 wet weather exceedances and 8 out of 21 dry weather exceedances, and LACFCD Tributary Station TS(15) Upper San Jose Creek detected 9 out of 10 wet weather exceedances and 3 out of 4 dry weather exceedances of the CTR WQO

[16] Based on data from the State Listing Policy lines of evidence ID #2425, #2426, #25164, and #25162 collected by the County of Los Angeles Department of Public Works, and the Los Angeles County Sanitation Districts, selenium is being considered for removal from the 303(d) list for Coyote Creek. The Regional Board concluded that the pollutant should not be on the 303(d) list because applicable water quality standards are not being exceeded. It has been recommended that the decision be approved by the State Board and selenium has not yet been removed from the 303(d) list for Coyote Creek

for zinc between 2002 and 2012. Since this meets the State Listing Criteria for 303(d) listing[17] zinc is classified as a Category 2C pollutant in San Gabriel River Reach 2 and San Jose Creek Reach 1.

Table 2-4: Water Quality Objectives for Category 2 Pollutants

Pollutant	Weather	Lowest Applicable WQO	Source
Ammonia	Wet	Varies based on pH and temperature for Cold waters and Warm Waters (Table 3-1 to 3-4 of Basin Plan)	Basin Plan—Total Ammonia-Nitrogen (NH3-N)
	Dry		
Copper	Wet	5.7 ug/L[(a)]	CTR Freshwater (1 hr avg.) dissolved
	Dry	4.1 ug/L[(a)]	CTR Freshwater (4 day avg.) dissolved
Cyanide	Wet	22 ug/L	CTR Freshwater (1 hr avg.)
	Dry	5.2 ug/L	CTR Freshwater (4 day avg.)
Diazinon	Wet	0.16 ug/L[(b)]	CA Dept. of Fish and Game Freshwater (1-hour avg)
	Dry	0.1 ug/L[(b)]	CA Dept. of Fish and Game Freshwater (4-day avg)
PAHs	Wet	See footnote (c)	CTR Human Health other than drinking water
	Dry	See footnote (c)	CTR Human Health other than drinking water
Mercury	Wet/Dry	0.051 ug/L	CTR Human Health (30-d avg; fish consumption only)
pH	Wet/Dry	6.5-8.5	LA Basin Plan
Selenium	Wet	20 ug/L	NTR Freshwater (1 hr avg.) total recoverable
	Dry	5 ug/L	NTR Freshwater (4 day avg.) total recoverable
Toxicity	Wet/Dry	See footnote (d)	Basin Plan
Zinc	Wet	54 ug/L[(a)]	CTR Freshwater (1 hr avg.) dissolved
	Dry	54 ug/L[(a)]	CTR Freshwater (4 day avg.) dissolved
Chloride	Dry	150 mg/L	Basin Plan: applies to specific portions of watershed
Lead	Dry	0.92 ug/L[(a)]	CTR Freshwater (4 day avg.) dissolved
Nickel	Dry	20 ug/L[(a)]	CTR Freshwater (4 day avg.) dissolved

a) Objectives for these constituents are hardness dependent. Values listed are based upon a total hardness of 40 mg/L.

b) Value adjusted by removing *Gammarus fasciatus* study results per recommendation of Finlayson, California Dept. of Fish and Game.

c) CTR does not contain criteria for total PAHs. Each available human health CTR Water Quality Objectives for other than drinking water will be applied.

d) 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 continuous flow bioassay tests shall be at least 90%, with no single test having less than 70% survival when using an established USEPA, State Board, or other protocol authorized by the Regional Board. There shall be no chronic toxicity in ambient 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.

[17] According to the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List Minimum Number of Measured Exceedances Needed to Place a Water Segment on the Section 303(d) List for Toxicants – Table 3.1.

2.1.3 CATEGORY 3 POLLUTANTS

The waterbody-pollutant combinations described below have been identified as exceeding water quality objectives (WQOs) in the Lower SGR Watershed. Through the adaptive management process, water quality priorities identified in this WMP will be re-evaluated every two years, and if exceedances of Category 3 WQOs are identified through monitoring, then the WMP will be adapted to become more effective in addressing these constituents, per Section VI.C.8.a.ii of the MS4 Permit. Note that station S(14) is of limited value to the Lower SGR Watershed as the watershed's drainage comprises approximately 2% of the drainage captured by this station. Therefore its precision in measuring MS4 contributions from the watershed is uncertain.

ALPHA-ENDOSULFAN

Although the waterbodies within the Lower SGR Watershed are not listed as impaired by Endulsulfan sulfates, the LACFCD Mass Emissions station S(13) in the Coyote Creek collected 1 out of 22 dry weather samples exceeding the California Toxics Rule WQO for this pollutant between 2002 and 2012. This exceedance occurred during the 2009-10 storm year, and there have been no further exceedances detected since this time. Alpha-Endosulfan is classified a category 3C. If exceedances are found to occur and the implemented or proposed control measures do not address Alpha-Endosulfan, the WMP will be revised to include control measures to address the pollutant directly.

CHLORIDE

According to the California 2010 Integrated Report, Coyote Creek was originally listed on the 303(d) list for chloride and was removed based on the conclusion that applicable water quality standards are not being exceeded. However, there were 4 out of 22 dry weather exceedances of the LA Basin Plan WQO for chloride at the LACFCD Mass Emissions station S(14) in San Gabriel River between 2002 and 2012 and 3 out of 23 wet weather exceedances of the USEPA National Recommended WQO for chloride at S(13) between 2002 and 2012; therefore, Chloride is classified a category 3A pollutant within this WMP. If exceedances are found to occur and the implemented or proposed control measures are not expected to address chloride, the Lower SGR WMP will be revised to include control measures to address the pollutant directly.

COPPER

LACFCD Tributary Station TS(17) North Fork Coyote Creek detected 4 out of 4 dry weather exceedances of the CTR WQO for copper between 2002 and 2012. Copper is classified as a Category 3C pollutant within this WMP. If exceedances are found to occur and the implemented or proposed control measures are not expected to address Copper, the Lower SGR WMP will be revised to include control measures to address the pollutant directly.

CYANIDE

LACFCD Tributary Station TS(17) North Fork Coyote Creek detected 1 out 8 wet weather and 1 out of 4 dry weather exceedances and Station TS(15) Upper San Jose Creek detected 1 out of 9 wet weather exceedances of the CTR WQO for cyanide between 2002 and 2012. Therefore Cyanide is classified as a

Category 3C pollutant for North Fork Coyote Creek and San Jose Creek Reach 1. If exceedances are found to occur and the implemented or proposed control measures are not expected to address cyanide, the Lower SGR WMP will be revised to include control measures to address the pollutant directly.

DISSOLVED OXYGEN

According to the California 2010 Integrated Report, dissolved oxygen (more correctly a lack of dissolved oxygen) was considered for placement onto 303(d) list for Coyote Creek; however, it was concluded that the dissolved oxygen should not be placed on the 303(d) list for Coyote Creek because applicable water quality standards are not being exceeded.

Although the waterbodies within the Lower SGR Watershed are not listed as impaired by low dissolved oxygen, the LACFCD Mass Emissions station S(13) in Coyote Creek collected 1 out of 39 wet weather samples below the dissolved oxygen water quality criteria between 2002 and 2012. This exceedance occurred during the 2003-04 storm year, and there have been no exceedances detected since that time. In addition, LACSD detected 10 out of 501 samples during dry weather in San Jose Creek and 11 out of 550 samples in San Gabriel River that were below the WQO for dissolved oxygen between 2004 and 2012. Therefore, dissolved oxygen is classified as a Category 3D pollutant within this WMP. If exceedances are found to occur through monitoring and the implemented or proposed control measures are not expected to address the dissolved oxygen impairment, the WMP will be revised to include control measures to address it directly.

LINDANE

Lindane is a persistent organic pollutant and is relatively long-lived in the environment.

Although the waterbodies within the Lower SGR Watershed are not listed as impaired by lindane, historical data detected exceedances of lindane in San Gabriel River Reach 2. Therefore, lindane is classified as Category 3A within this WMP. If exceedances are found to occur and the implemented or proposed control measures are not expected to address the pollutant, the WMP will be revised to include control measures to address it directly.

METHYLENE BLUE ACTIVE SUBSTANCES (MBAS)

An MBAS assay is used to detect the presence of detergents or foaming agents in water samples.

Although the waterbodies within the Lower SGR Watershed are not listed as impaired by MBAS, the LACFCD Mass Emissions station S(13) in Coyote Creek collected 5 out of 42 wet weather samples, the LACFCD Mass Emissions station S(14) in Upper San Gabriel River collected 1 out of 37 wet weather samples that exceeded the Basin Plan WQO for MBAS between 2002 and 2012. Therefore, MBAS is classified as Category 3D within this WMP. If exceedances are found to occur and the implemented or proposed control measures are not expected to address the pollutant, the WMP will be revised to include control measures to address it directly.

pH

LACFCD Tributary Station TS(17) North Fork Coyote Creek detected 3 out of 4 dry weather exceedances of the LA Basin Plan WQO for pH between 2002 and 2012. Therefore pH is classified as a Category 3D pollutant within this WMP. If exceedances are found to occur through monitoring and the implemented or proposed control measures are not expected to address the impairment, the WMP will be revised to include control measures to address pH directly.

Selenium

Selenium is classified as a Category 1B pollutant for San Jose Creek Reach 1 during dry weather as it is to be addressed by the USEPA established San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL; however, waste load allocations (WLAs) are not provided for the San Gabriel River or Coyote Creek.

Although the San Gabriel River Reach 1 is not listed as impaired by selenium, the Council for Watershed Health monitoring site SGLT5617 in the San Gabriel River detected 1 exceedance of the National Toxics Rule WQO for selenium between 2005 and 2009. Therefore, selenium is classified as a Category 3C pollutant within this WMP for the San Gabriel River Reach 1. It is anticipated that the control measures used to address the pollutants within the San Gabriel River and Impaired Tributaries Metals and Selenium TMDL will subsequently address selenium; however, if exceedances are found to occur and the implemented or proposed control measures do not address sulfates, the WMP will be revised.

Sulfates

Although the waterbodies within the Lower SGR Watershed are not listed as impaired by sulfates, the LACFCD Mass Emissions station S(14) in the Upper San Gabriel River collected 1 out of 22 dry weather samples exceeding the Basin Plan WQO for sulfates between 2002 and 2012. This exceedance occurred during the 2009-10 storm year, and there have been no exceedances detected since that time. In addition, the LACSD detected 1 out of 503 dry weather samples exceeding the California Secondary MCL for sulfates between 2004 and 2012 in the San Jose Creek. Therefore, Sulfates are classified as a Category 3A within this WMP for the San Gabriel River Reach 1 and the San Jose Creek; however, these waterbody/pollutant combinations will not be directly addressed through the WMP. It is anticipated that the control measures used to address the pollutants within San Gabriel River Metals and Impaired Tributaries Metals and Selenium TMDL will subsequently address sulfates; however, if exceedances are found to occur and the implemented or proposed control measures do not address sulfates, the WMP will be revised to include control measures to address the pollutant directly.

Total Dissolved Solids

Total Dissolved Solids (TDS) is a measure of the combined content of all inorganic and organic substances contained in a liquid. The LACFCD Mass Emission station S(14) collected 2 out of 22 dry weather samples exceeding the LA Basin Plan WQO for Total Dissolved Solids between 2002 and 2012.

Therefore TDS is classified as a Category 3D within this WMP. If exceedances are found to occur and the implemented or proposed control measures are not expected to address the condition, the WMP will be revised to include control measures to address it directly.

2.1.4 POLLUTANT CLASSIFICATION

In order to determine the sequence of addressing pollutants of concern, the pollutants have been placed into classification groups. Pollutants have been identified to be in the same "class" if they have a similar fate and transport, can be addressed via the same types of control measures, and can be addressed within the same timeline. The six following classes have been identified:

- Metals
- Nutrients
- Bacteria
- Pesticides
- Semivolatile Organic Compounds (SVOC)
- Water Quality Indicators/General

The specific classes and pollutants associated can be found below. Since similar control measures and timelines are to be implemented for pollutants within the same class, each class will be treated with the highest priority of any one pollutant within that class. Watershed Control Measures and Compliance Schedules are discussed in Sections 3 and 5, respectively.

METALS

Copper
Lead
Mercury
Nickel
Selenium
Zinc

NUTRIENTS

Ammonia

BACTERIA

Coliform Bacteria
E.Coli

PESTICIDES

Alpha Endosulfan
Diazinon
Lindane

SVOCS

PAHs

WATER QUALITY INDICATORS/GENERAL

Chloride
Cyanide
Dissolved Oxygen
MBAS
pH
Sulfate
Total Dissolved Solids
Toxicity

2.2 WATER QUALITY CHARACTERIZATION

In order to characterize existing water quality conditions in the Lower SGR Watershed, and to identify pollutants of concern for prioritization per section VI.C.5.a.ii of the MS4 Permit, available monitoring data collected during the previous ten years were analyzed. The following sources were utilized during the water quality characterization:

- LACFCD Mass Emission and Tributary Monitoring Programs
- Los Angeles County Sanitation Districts (LACSD)
- San Gabriel River Regional Watershed Monitoring Program (SGRRMP)
- County of Orange Coyote Creek Monitoring Program

A summary of each of these monitoring efforts and relevant findings is presented below. In addition to providing a characterization of the current conditions within the watershed, this information will be used to target watershed management efforts in the Lower SGR Watershed.

2.2.1 MASS EMISSIONS HISTORICAL DATA ANALYSIS

Since 1994, the LACFCD has conducted stormwater monitoring in Los Angeles County. The LACFCD operates seven mass emission monitoring stations, which collect runoff from the major watersheds in the county with the goal of estimating the mass emissions from the MS4, assessing mass emissions trends, and determining whether the MS4 is contributing to exceedances of water quality standards by comparing results to applicable objectives in the Water Quality Control Plan for the Los Angeles Region (Basin Plan), and the California Toxics Rule (CTR).

The mass emissions monitoring dataset is the most comprehensive information to date regarding the condition of water quality in the San Gabriel River and its tributaries. Two LACFCD Monitoring Stations, S(13) and S(14), collect samples that are applicable to the Lower SGR Watershed.

COYOTE CREEK MONITORING STATION S(13)

The Coyote Creek Monitoring station, S(13), is located at the existing Army Corps of Engineers stream gauge station (i.e. Stream Gauge F354-R) below Spring Street in the Lower SGR Watershed. The upstream tributary area is 150 square miles and extends into Orange County. The sampling station was chosen to avoid backwater effects from the San Gabriel River to ensure that all water being sampled is from Coyote Creek only. Coyote Creek is a concrete-lined trapezoidal channel at this location. Figure 2-2 shows the location and sub-drainage area of this station.

SAN GABRIEL MONITORING STATION S(14)

The San Gabriel River Monitoring Station, S(14), is located at an historic stream gauge station (Stream Gauge F263C-R), below San Gabriel River Parkway in Pico Rivera. Approximately 10% of the Lower SGR Watershed area drains to the San Jose Creek which discharges to the San Gabriel River Reach 2 upstream of the S(14) monitoring station. Lower SGR Watershed drainage comprises approximately 2% of the drainage captured by this station. While the Watershed Group is aware of this monitoring

location and analyzed 10 years of data to determine WQPs, it may not be wholly representative of MS4 contributions from the Lower SGR Watershed since the station captures runoff from a large area outside of the Lower SGR Watershed. The Lower SGR Watershed Group will continue to monitor this station through the Lower SGR CIMP.

The upstream tributary area for station S(14) is 450 square miles (most of this area falls outside of the Lower SGR Watershed). The San Gabriel River is a grouted rock-concrete stabilizer along the western levee and a natural section on the eastern side. Flow measurement and water sampling are conducted in the grouted rock area along the western levee of the river. The length of the concrete stabilizer is nearly 70 feet. The San Gabriel River sampling location has been an active stream gauging station since 1968. Figure 2-3 shows the location and sub-drainage area of this station.

Both stations, S(13) and S(14), are equipped with automated samplers with integral flow meters, and collect flow composite samples from a minimum of three storm events, including the first storm, and two dry weather events in accordance with the 1996 MS4 Permit.

Monitoring data from stormwater collected at stations S(13) and S(14) were compared to the most stringent applicable WQOs to determine exceedances of receiving water limitations. WQOs were determined pursuant to TMDLs, the Basin Plan and the California Toxics Rule, 40 CFR Part 131.38 (CTR). Water quality objectives for chlorpyrifos and diazinon were determined using the freshwater final acute criteria set by the California Department of Fish and Game. Many of the WQOs were used as benchmarks for determining Water Quality Priorities, and should not be used for compliance purposes. Please refer to the Lower SGR Watershed Coordinated Integrated Monitoring Plan (CIMP) for a table of monitored constituents along with their most up-to-date WQOs.

A summary of the constituents not attaining WQOs at stations S(13) and S(14) during the monitoring years 2002-2012 is presented in Tables 2-5 to 2-8 below. Complete tables of monitoring results can be found in Appendix 2-2. Constituents were compared against the most appropriate WQO to date. Refer to CIMP Appendices for a table of monitored constituents along with applicable WQOs.

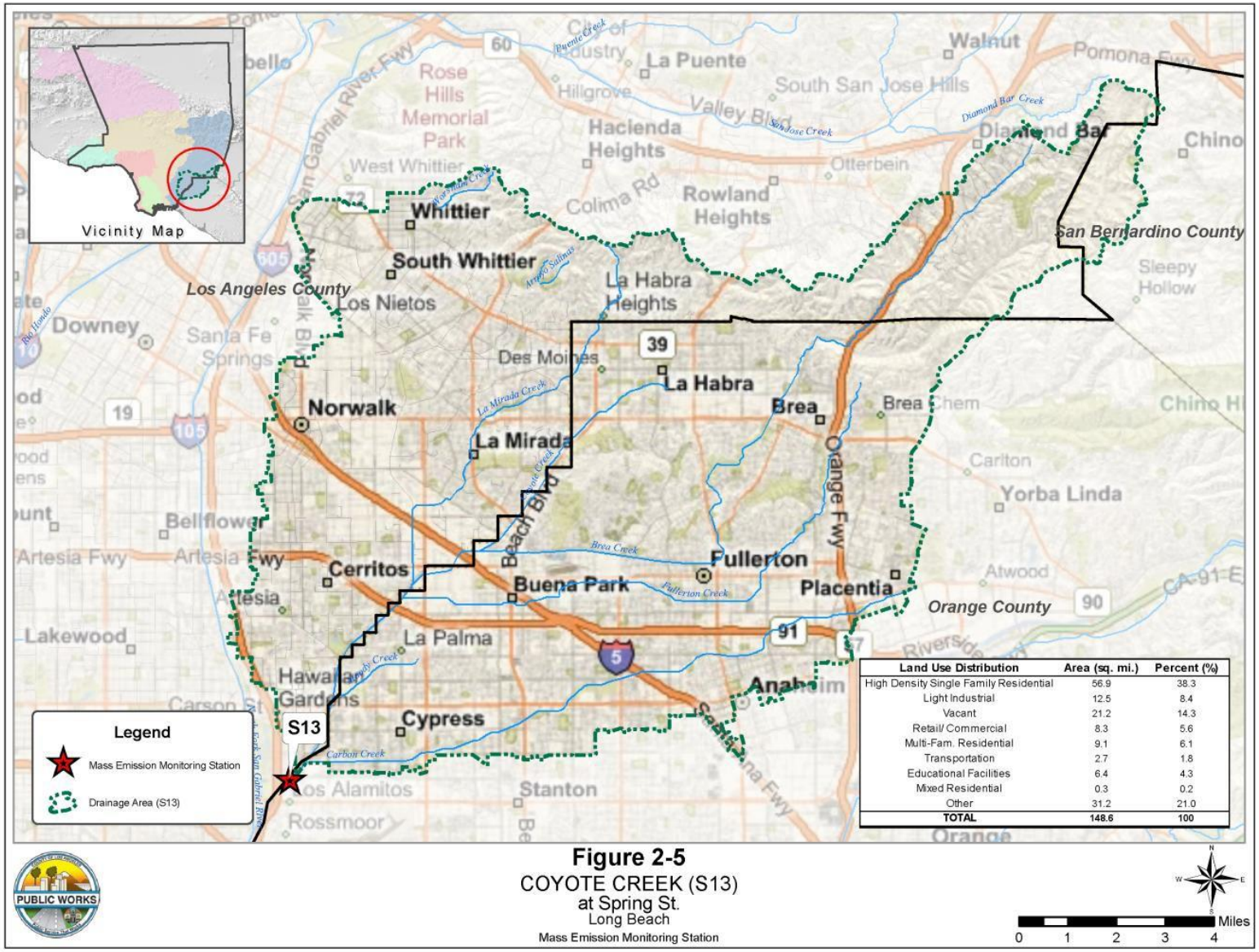

Figure 2-2: Coyote Creek S(13) monitoring station

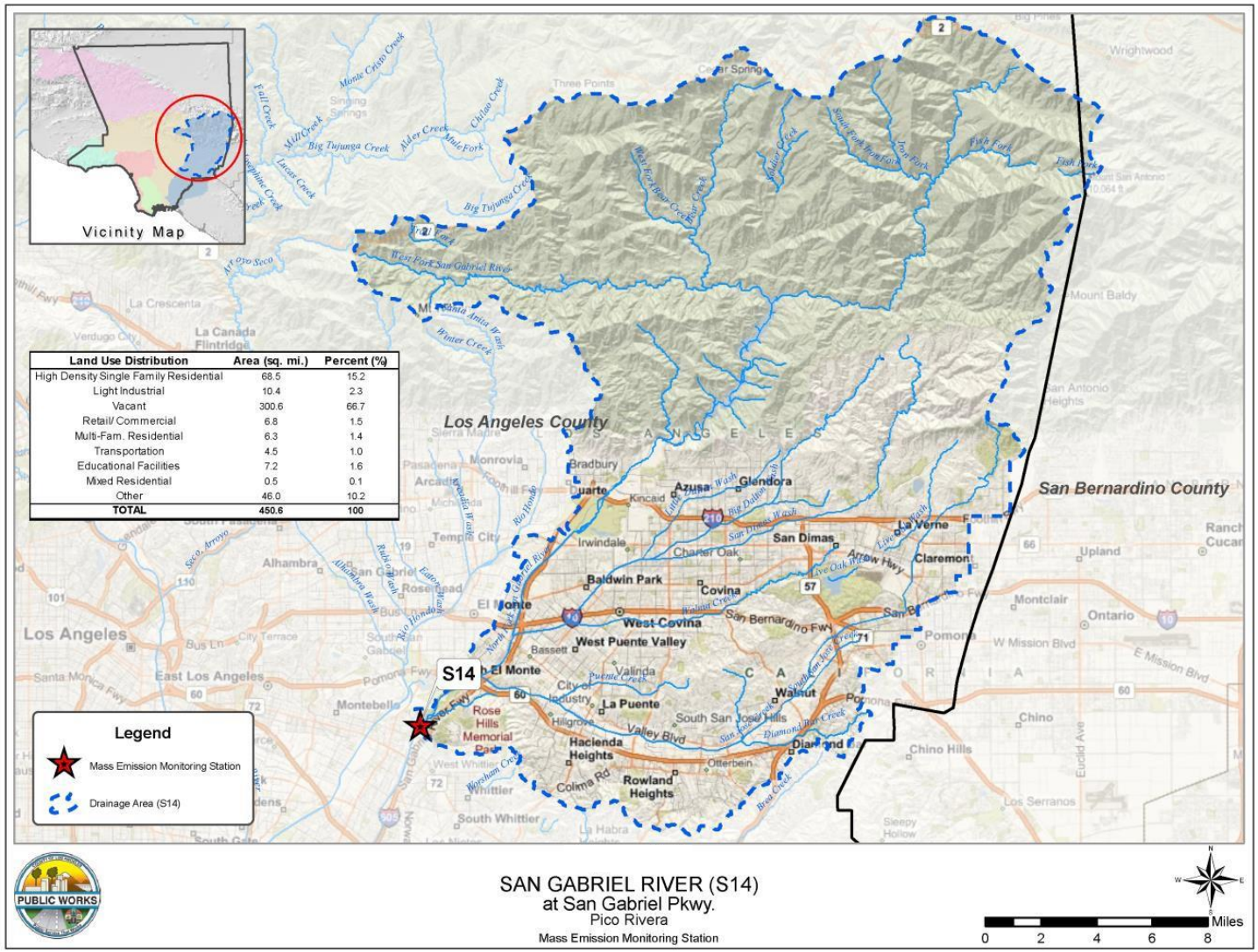

Figure 2-3: San Gabriel River (S14) Monitoring Location

Table 2-5: S(13) Constituents exceeding WQOs during wet weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Cyanide	40	4	10	0.022	CTR Freshwater Aquatic Life Protection - Acute
pH	42	2	5	6.5-8.5	LA Basin Plan
Dissolved Oxygen	39	1	3	5	LA Basin Plan
Total Coliform	40	37	93	10000	LA Basin Plan - Marine Waters
Fecal Coliform	40	40	100	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	40	40	100	104	LA Basin Plan - Marine Waters
MBAS	42	5	12	0.5	LA Basin Plan
Total Copper	42	26	62	27	SG River Metals TMDL
Total Lead	42	1	2	106	SG River Metals TMDL
Total Selenium	42	1	2	5	SG River Metals TMDL
Dissolved Zinc	42	8	19	120	CTR-100mg/L CMC
Total Zinc	42	29	69	106	SG River Metals TMDL
Diazinon	42	3	7	0.08	CADF&G

Table 2-6: S(13) Constituents Exceeding WQOs during dry weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Cyanide	23	22	96	0.0052	CTR Freshwater Aquatic Life Protection, Chronic
pH	23	5	22	6.5-8.5	LA Basin Plan
Total Coliform	23	10	43	10000	LA Basin Plan - Marine Waters
Fecal Coliform	23	18	78	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	23	16	70	104	LA Basin Plan - Marine Waters
Chloride	23	3	13	230	USEPA National Recommended Criteria
Total Copper	23	3	13	19.1	SG River Metals TMDL
Total Lead	23	9	39	0.92	CTR Freshwater Aquatic Life Criteria - Chronic
Total Selenium	23	14	61	5	SG River Metals TMDL
Total Zinc	23	1	4	95.6	SG River Metals TMDL
Diazinon	23	2	9	0.05	CADF&G
Alpha Endosulfan	23	1	0.04	0.034	CTR Freshwater Aquatic Life Protection, Chronic

Table 2-7: S(14) Constituents exceeding WQOs during wet weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Cyanide	38	4	11	0.022	CTR Freshwater Aquatic Life Protection - Acute
pH	38	2	5	6.5-8.5	LA Basin Plan
Total Coliform	38	33	87	10000	LA Basin Plan - Marine Waters
Fecal Coliform	38	36	95	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	38	36	95	104	LA Basin Plan - Marine Waters
MBAS	37	1	3	0.5	LA Basin Plan
Total Copper	38	23	61	14	CTR Aquactic Life Protection - Acute
Total Zinc	38	27	71	54	CTR Aquactic Life Protection - Acute
Diazinon	39	4	10	0.08	CADF&G

Table 2-8: S(14) Constituents exceeding WQOs during dry weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Cyanide	22	16	73	0.0052	CTR Freshwater Aquatic Life Protection - Chronic
pH	21	3	14	6.5-8.5	LA Basin Plan
Total Coliform	22	11	50	10000	LA Basin Plan - Marine Waters
Fecal Coliform	22	12	55	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	22	12	55	104	LA Basin Plan - Marine Waters
Chloride	22	4	18	150	LA Basin Plan
Sulfate	22	1	5	300	LA Basin Plan
Total Dissolved Solids	22	2	9	750	LA Basin Plan
Total Copper	21	14	67	9.3	CTR Aquatic Life Protection - Chronic

2.2.2 LACFCD TRIBUTARY MONITORING

In addition to the Mass Emission Station monitoring, LACFCD conducted tributary monitoring during the 2006-07 and 2007-08 storm years. This monitoring occurred at 4 tributary stations that fall within the Lower SGR Watershed: TS15: Upper San Jose Creek, TS16: Maplewood Channel, TS17: North Fork Coyote Creek, and TS18: SD 21 (Artesia Norwalk Drain). Two of these sites are located in the storm drain system (TS15 and TS18), while TS15 and TS17 are in 303(d) listed receiving waterbodies. Note: only the data from TS15 and TS17 was used to characterize receiving water and identify WQPs in the Lower SGR watershed. Data analyzed from the TS16 and TS18 will be considered in pollutant source identification during WMP implementation.

TS15: UPPER SAN JOSE CREEK

The Upper San Jose Creek tributary monitoring site is located on Upper San Jose Creek in the City of Industry, upstream of the confluence with Puente Creek. The site is approximately 500 feet south of where Don Julian Road crosses Puente Creek. The upstream tributary watershed area of Upper San Jose Creek is approximately 72.60 square miles.

TS16: MAPLEWOOD CHANNEL

The Maplewood Channel tributary monitoring site is located on Maplewood Channel in Bellflower City, where Trabuco Street ends and crosses Maplewood Channel. The upstream tributary watershed area of Maplewood Channel is approximately 4.90 square miles.

TS17: NORTH FORK COYOTE CREEK

The North Fork Coyote Creek tributary monitoring site is located on North Fork Coyote Creek in the City of Cerritos, where Artesia Boulevard crosses North Fork Coyote Creek. The upstream tributary watershed area of North Fork Coyote Creek is approximately 34.89 square miles.

TS 18: SD 21 (ARTESIA-NORWALK DRAIN)

The SD 21 (Artesia-Norwalk Drain) monitoring site is located on SD 21 (Artesia–Norwalk Drain) in the City of Long Beach, where Wardlow Road crosses the SD 21 (Artesia-Norwalk Drain). The upstream tributary watershed area of this site is approximately 4.14 square miles.

Monitoring data from stormwater collected at stations TS15 and TS17 were compared to the most stringent applicable WQOs to determine exceedances of receiving water limitations. WQOs were determined pursuant to TMDLs, the Basin Plan and the California Toxics Rule, 40 CFR Part 131.38 (CTR). WQOs for chlorpyrifos and diazinon were determined using the freshwater final acute criteria set by the California Department of Fish and Game. Many of the WQOs were used as benchmarks for determining Water Quality Priorities, and should not be used for compliance purposes. Please refer to the CIMP for a table of monitored constituents along with their most up-to-date WQOs.

A summary of the constituents not attaining WQOs at stations TS(15) and TS(17) during the monitoring years 2002-2012 is presented in Tables 2-9 to 2-12 below. Complete tables of monitoring results can be found in Appendix 2-2.

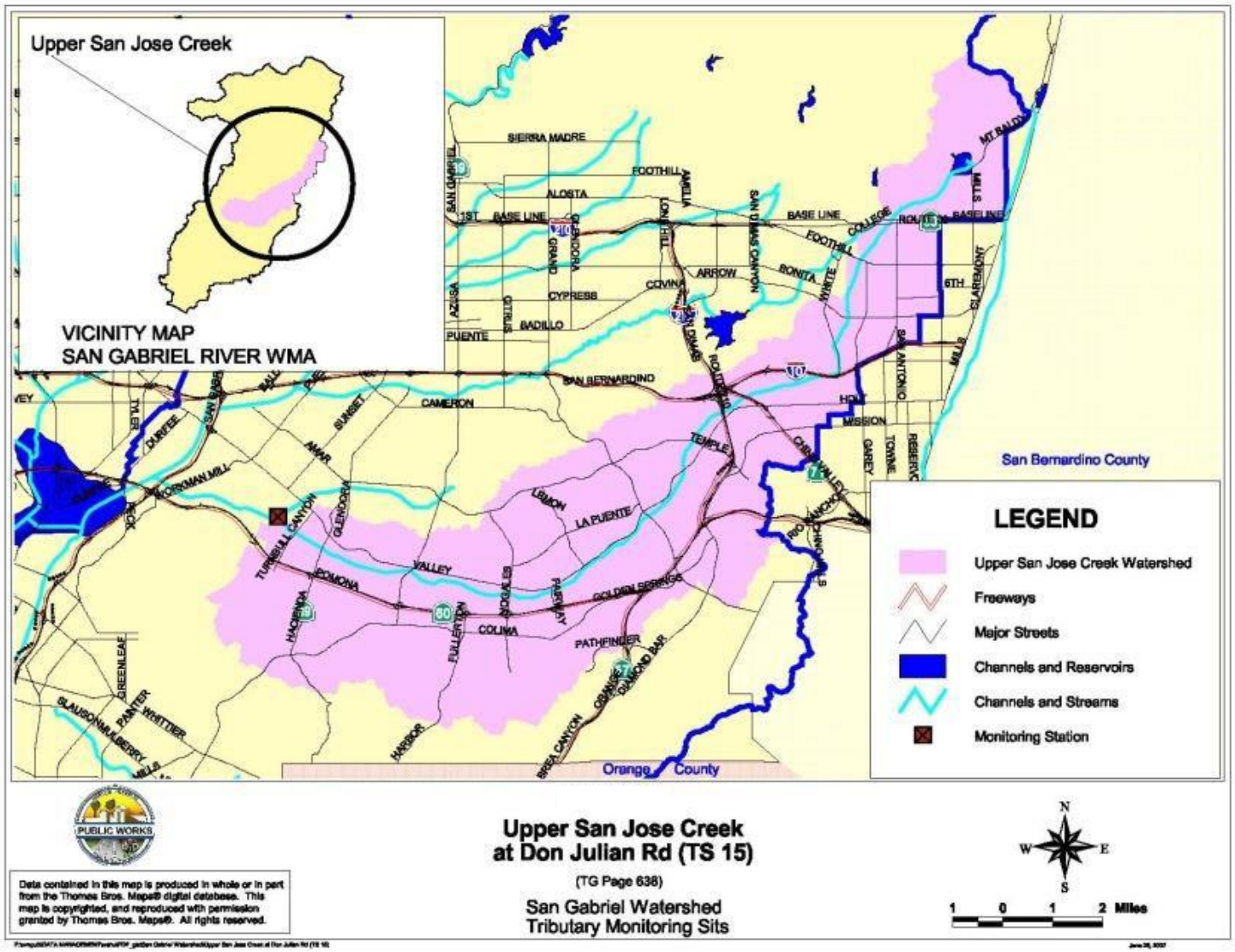

Figure 2-4: TS15 monitoring location

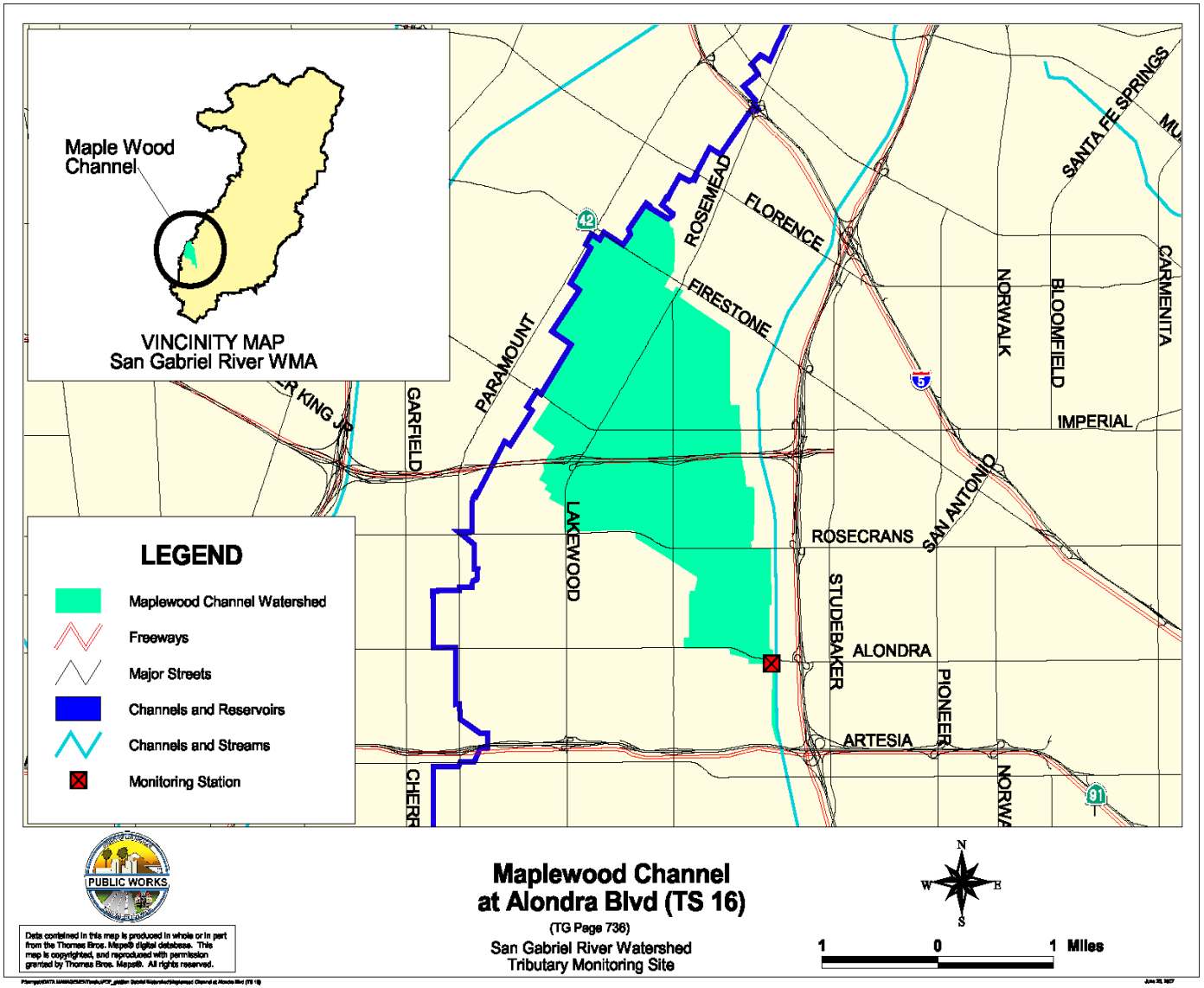

Figure 2-5: TS16 monitoring location

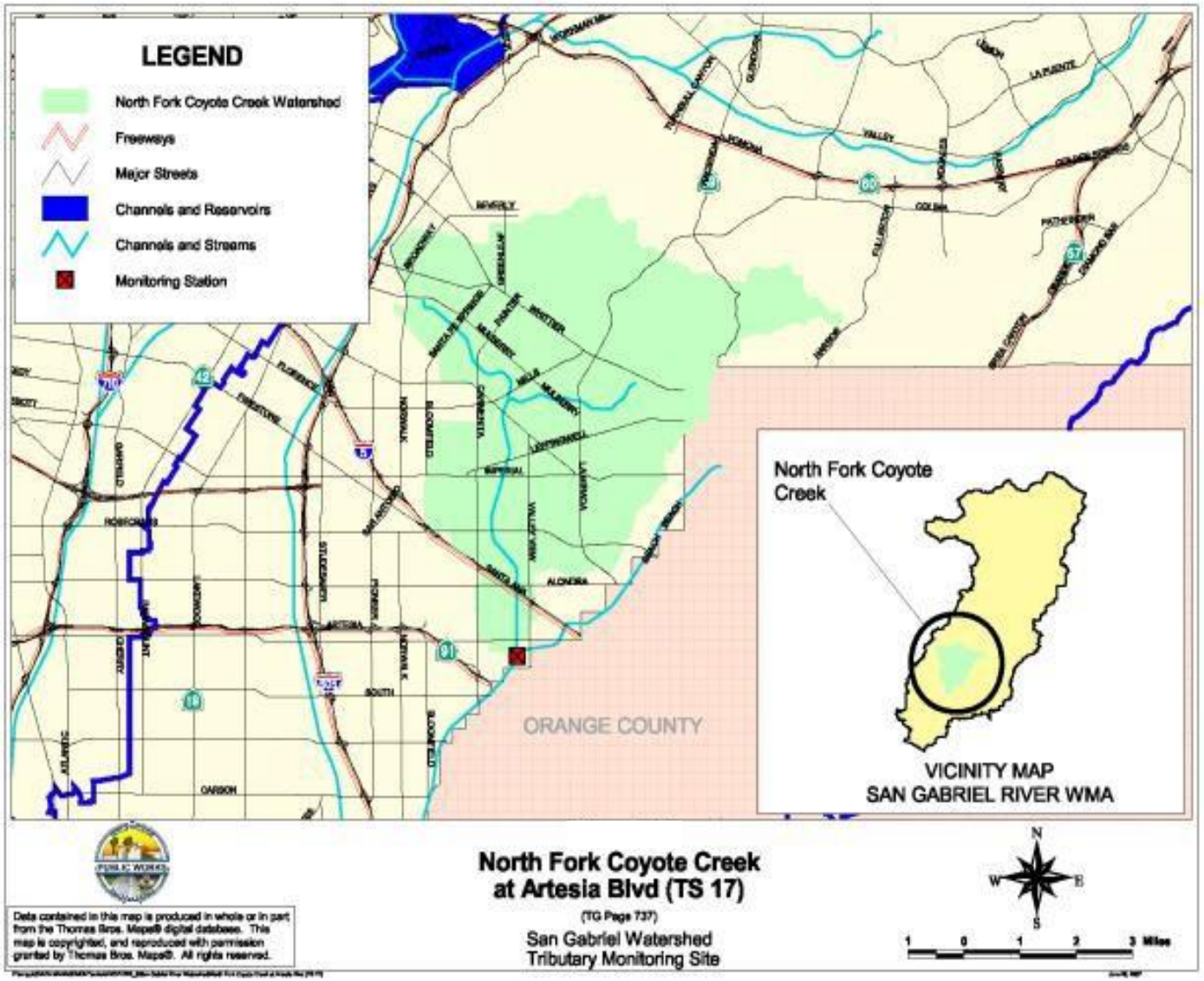

Figure 2-6: TS17 monitoring location

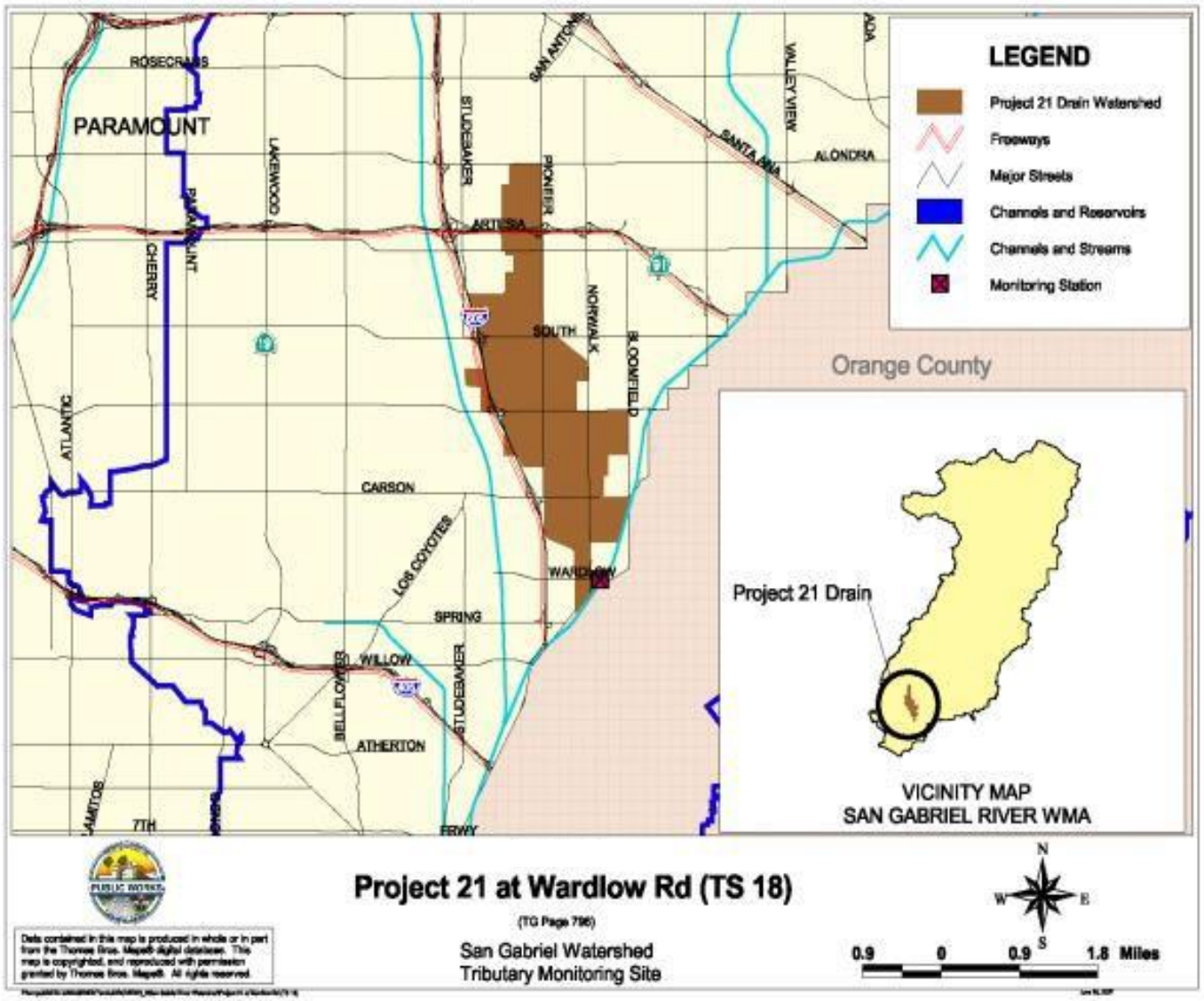

Figure 2-7: SD21 monitoring site location

Table 2-9: TS15 Constituents exceeding WQOs during wet weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Cyanide	8	1	13	0.022	CTR Freshwater Aquatic Life Protection - Acute
Total Coliform	8	8	100	10000	LA Basin Plan - Marine Waters
Fecal Coliform	8	8	100	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	8	8	100	104	LA Basin Plan - Marine Waters
Total Copper	10	9	90	14	CTR Freshwater Aquatic Life Protection – Acute
Total Mercury	4	1	25	0.051	CTR Human Health Consumption

Table 2-10: TS15 Constituents exceeding WQOs during dry weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Total Coliform	4	4	100	10000	LA Basin Plan - Marine Waters
Fecal Coliform	4	4	100	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	4	4	100	104	LA Basin Plan - Marine Waters

Table 2-11: TS17 Constituents exceeding WQOs during wet weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
Cyanide	4	1	25	0.022	CTR Freshwater Aquatic Life Protection - Acute
pH	4	3	75	6.5-8.5	LA Basin Plan
Total Coliform	4	2	50	10000	LA Basin Plan - Marine Waters
Fecal Coliform	4	2	50	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	4	2	50	104	LA Basin Plan - Marine Waters
Total Mercury	810	12	1320	0.022051	CTR Human Health Consumption

Table 2-12: TS17 Constituents exceeding WQOs during dry weather

Constituent	No Samples	No. Exceeding Applicable WQOs	Percent of Samples Exceeding WQOs	Source of Lowest Applicable WQO Value	Source
pH	4	3	75	6.5-8.5	LA Basin Plan
Total Coliform	4	4	100	10000	LA Basin Plan - Marine Waters
Fecal Coliform	4	4	100	235	LA Basin Plan Fresh- Rec 1 Standard
Fecal Enterococcus	4	2	50	104	LA Basin Plan - Marine Waters

2.2.3 LA COUNTY SANITATION DISTRICT MONITORING

The County Sanitation Districts of Los Angeles County (LACSD) are a confederation of 23 independent special districts serving the water pollution control management needs of about 5.7 million people in Los Angeles County. The Sanitation Districts' service area covers approximately 820 square miles and encompasses 78 cities and unincorporated territory within the County. With regard to wastewater treatment, the Sanitation Districts construct, operate and maintain facilities to collect, treat and dispose of wastewater and industrial wastes.

Seventeen of the 23 districts are signatory to an agreement which provides for sewerage service to the majority of residential, commercial and industrial users (IUs) within the County, but mostly located outside of the City of Los Angeles service area. This treatment system, known as the Joint Outfall System (JOS), currently consists of the Joint Water Pollution Control Plant (JWPCP) located in the City of Carson and six upstream water reclamation plants (WRPs); the Whittier Narrows WRP near the City of South El Monte, the Los Coyotes WRP in the City of Cerritos, the San Jose Creek WRP adjacent to the City of Industry, the Long Beach WRP in the City of Long Beach, the Pomona WRP in the City of Pomona and the La Cañada WRP in La Cañada Flintridge. All JOS facilities except the La Cañada WRP are regulated under the NPDES program; all six WRPs are subject to California Waste Discharge or Water Reclamation Requirements. See Chapter 1 Introduction for more detail on the WRP discharges within the Lower SGR Watershed.

The LACSD monitors its effluent at multiple locations within the Lower SGR Watershed. Data from 2004 to 2012 was analyzed and exceedances of the following constituents were found: PAHs in San Gabriel River Reach 2 and San Jose Creek Reach 1, Nickel in Coyote Creek, Chloride in San Jose Creek Reach 1, Sullfates in San Jose Creek Reach 1, and Dissolved Oxygen in San Gabriel River Reach 1 and San Jose Creek Reach 1.

2.2.4 COUNCIL FOR WATERSHED HEALTH SAN GABRIEL RIVER REGIONAL MONITORING PROGRAM

Since 2005, the San Gabriel River Regional Monitoring Program (SGRRMP), a group of local, state, and federal stakeholders led by the Council for Watershed Health, has conducted watershed scale dry weather (May through July) monitoring at targeted and random sites throughout the San Gabriel River watershed. From 2005-2009, the SGRRMP collected and analyzed aquatic chemistry, toxicity bioassessment, and physical habitat data from 69 randomly selected sites within the San Gabriel River watershed representing the upper river watershed, the lower river watershed, and mainstream channel below Whittier Narrows. The SGRRMP also relied on LACFCD tributary monitoring in the San Gabriel River and Coyote Creek watersheds for assessing water quality conditions. A map of randomly selected sites used for biological assessment, along with their biological condition scores is shown in Figure 2-29.

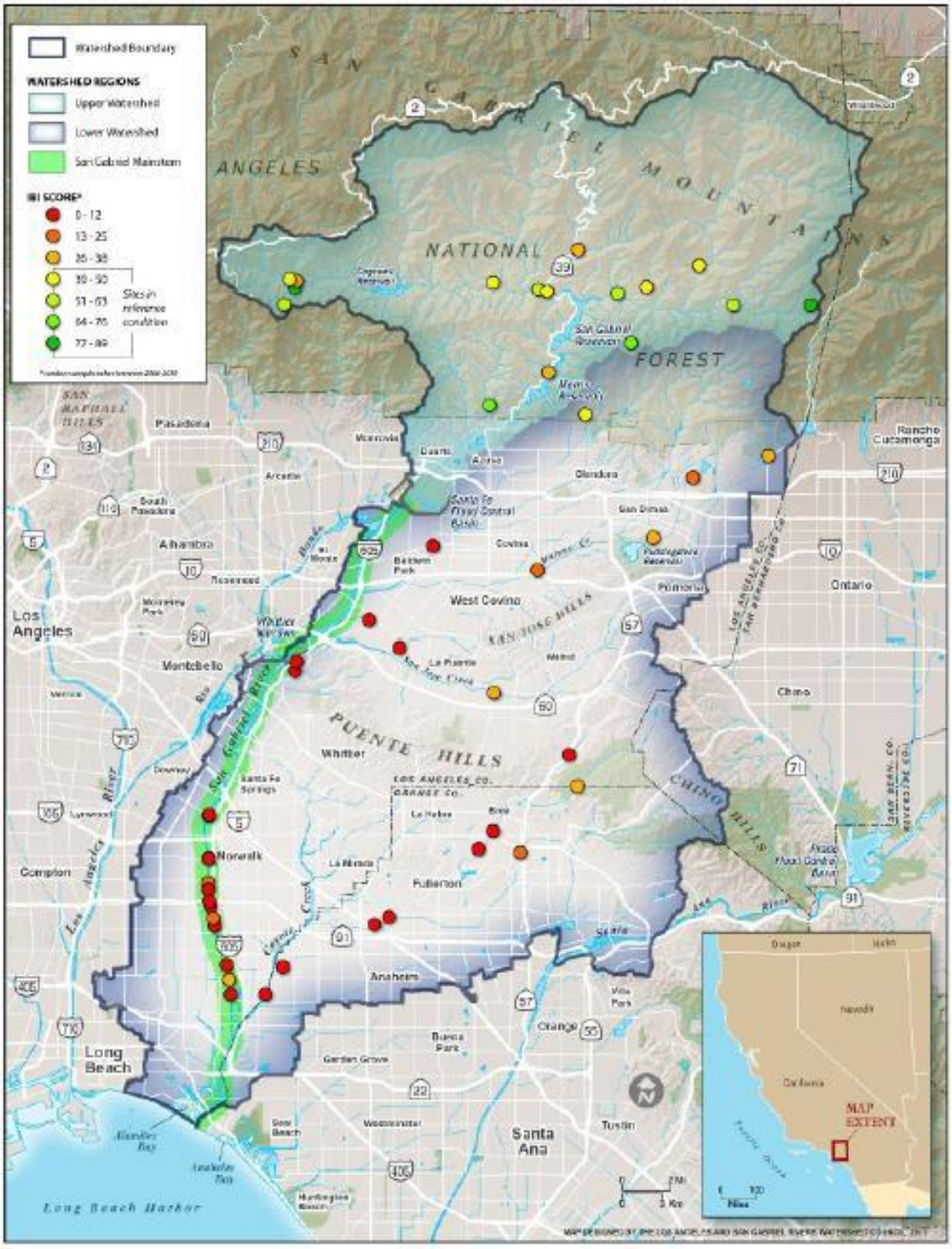

Figure 2-8: SGRRWMP stream monitoring locations used for water quality and biological conditions assessment

The following is a summary of significant observations found after the first five years of monitoring under this program[18]:

- "There were few exceedances of dry weather Basin Plan standards for any water quality parameters measured during the 5-year period."
- "Nutrients were greatest on the mainstem, while most metals were greatest in lower tributaries. An exception to this was dissolved zinc, which was much greater on the mainstem compared to other sub-regions."
- "While nutrients and metals were elevated in the lower tributaries and mainstem, they rarely exceeded water quality objectives and did not strongly correlate with the biotic condition."
- "Nitrate and ammonia were well below toxicity thresholds/standard and there were no exceedances of the hardness-adjusted California toxics rule for any dissolved metal."
- "Organophosphorous and pyrethroid pesticides were nearly always below method detection limits (i.e. Non-detect)."
- "A total of 61 water samples tested for acute and chronic toxicity using water fleas"…"All of the toxic endpoints measured during the five years were in the lower or upper watershed, with no toxicity measured on the San Gabriel River mainstem."
- 317 water samples collected at the confluence of 5 major tributaries with the San Gabriel River during the summers of 2007, 2008, and 2009 were analyzed for E. coli. "47% of these samples exceeded standards with the greatest rate of exceedances occurring at San Jose Creek (range 89 to 100%) and the fewest at Coyote Creek (10 to 29%)."[19]
- "San Jose Creek conveys the largest [relative] loads of most constituents during wet weather, particularly total suspended solids (TSS)."[29]

The Lower SGR Watershed will use these results, and continue to track future SGRRMP results to help target watershed control measures identified in the WMP.

2.2.5 ORANGE COUNTY COYOTE CREEK SOURCE CONTROL PLAN

The Orange County NPDES Municipal Stormwater Permit (Order No. R8-2009-0030) requires Permittees with discharges tributary to Coyote Creek to develop and implement a constituent-specific source control plan to include a monitoring program to control the discharge of copper, lead and zinc into Coyote Creek and other tributaries in Orange County that discharge into the San Gabriel River.

The Coyote Creek Source Control Plan outlines the monitoring and source control strategy for jurisdictions within Orange County draining to Coyote Creek. This Plan identifies monitoring locations to be used in determining source control strategies and compliance with TMDL targets for Coyote Creek within the Orange County jurisdiction. According to this plan, stormwater discharges from Los Angeles County are contributed through North Fork Coyote Creek, and at the confluence with the San Gabriel River. All monitoring locations identified in this plan that are downstream of North Fork Coyote Creek

[18] Morris, K. et al.

[19] Only approximately 10% of the Lower SGR Watershed contributes discharge to San Jose Creek

are located on the Orange County side of the confluence with the Creek, and are meant to be representative of Orange County drainage. Therefore, data collected from these locations cannot be used to characterize Los Angeles County MS4 discharges at this time. The Watershed Group will continue to remain apprised of monitoring results collected through the Orange County Source Control effort, and revise this WMP should data suggest that the Los Angeles County MS4 may be contributing to exceedances of water quality objectives.

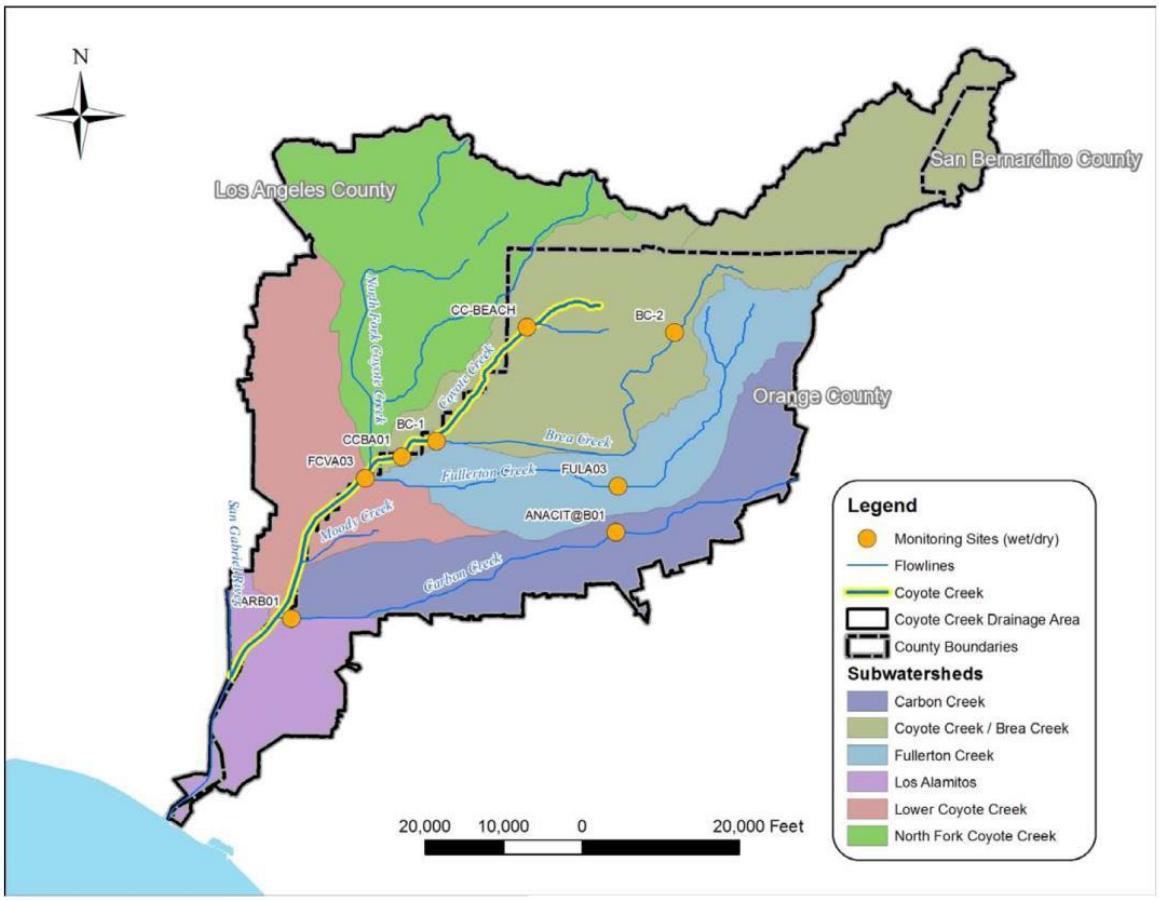

Figure 2-9: County of Orange, OC Watersheds Program Source Control Plan Monitoring Locations along Coyote Creek (*Coyote Creek Watershed Water Quality Monitoring Plan, Figure 2-1*)

2.3 SOURCE ASSESSMENT

This section identifies the potential sources of pollutants within the Lower LSGR Watershed for the waterbody-pollutants classified in section 2.2. Information was gathered from several water quality monitoring programs and special studies related to pollutant sources and conditions that contribute to the highest water quality priorities to identify known and suspected stormwater and non-stormwater pollutant sources to and from the MS4.

The pollutants addressed in this section are bacteria, nutrients, metals and sediment. In order to generally describe the potential sources in the Lower LSGR Watershed for these pollutants, pollutant sources have been divided into the following categories: NPDES discharges, road infrastructure, atmospheric deposition, and wastewater from sanitary sewer and SSOs.

2.3.1 NPDES SOURCES

Pollutant sources may be categorized as either point sources or non-point sources. Point source discharges are regulated through National Pollutant Discharge Elimination System (NPDES) permits. Point sources include those associated with the MS4 (stormwater and urban runoff) and other NPDES discharges. Stormwater runoff in the watershed is regulated through four types of permits including MS4 permits, a statewide stormwater permit for Caltrans; a statewide Construction General Permit (CGP); and a statewide Industrial General Permit (IGP). The NPDES IGP regulates stormwater discharges and authorized non-stormwater discharges from ten specific categories of industrial facilities, including manufacturing facilities, oil and gas mining facilities, landfills, and transportation facilities. The NPDES CGP regulates stormwater discharges from construction sites that result in land disturbances equal to or greater than one acre. Point source discharges from IGP, CGP, residential, commercial and transportation activities can be a significant source of pollutant loads.

Non-point sources by definition include pollutants that reach waters from a number of land uses and are not regulated through NPDES permits. Non-point sources include existing contaminated sediments within the watershed and direct air deposition to the waterbody surface.

The following provides additional discussion regarding the presence of pollutants in stormwater runoff within the watershed.

BACTERIA

Specific sources of bacteria are associated with categories such as, anthropogenic, non-anthropogenic, and environmental sources, which may include:

- Sanitary sewer overflows (SSOs), leaks and spills; illicit connections of sanitary lines to the storm drain system.
- Animal wastes – the bacteria indicators used to assess water quality are not specific to human sewage; therefore, natural influences of fecal matter from animals and birds can also be a source of elevated levels of bacteria.

- Organic debris from gardens, landscaping, parks, food waste and illegal dumping from recreational vehicle holding tanks among others, can be a source of elevated levels of total coliform bacteria[1].
- Environmental – soils, decaying vegetation
- Illegal connections and illicit discharges (IC/IDs) to the MS4 are also very likely sources of bacteria in stormwater discharges. The following table includes data based on annual reports submitted to the LA County DPW (previous principal permittee), for illicit connections and illicit discharges. Current data on the constituents for the IC/IDs recorded during this period is not available.

Table 2-13 Illicit Connections/Illicit Discharges 2001-2012

Agency	Illicit Discharges	Illicit Connections
Artesia	21	0
Bellflower	135	0
Cerritos	100	0
Diamond Bar	149	1
Downey	467	6
Hawaiian Gardens	41	0
La Mirada	121	0
Lakewood	162	0
Long Beach	-	-
Norwalk	219	1
Pico Rivera	-	-
Santa Fe Springs	82	2
Whittier	7	1
Total	1,504	11

NUTRIENTS

Possible sources of nutrients include runoff from residential and commercial areas due to landscaping activities and use of fertilizer for lawns and gardens, this includes organic debris. Activities such as washing cars, parking lots and driveways can contribute to nutrients pollutants in the MS4 since most of the detergents used contain phosphorus. Other sources of nutrients include food wastes, domestic animal waste; and human waste from areas inhabited by the homeless. These pollutants build up and are then washed into the waterways through the storm drain system when it rains. These kinds of loads are typically highest during the first major storm flush and even after extended periods of dry weather when pollutants have accumulated. Other major categories of nutrients sources include:

Golf courses are a major source of nutrients since fertilization activities and watering rates are generally much greater than the residential and commercial areas. The excess nutrients accumulated in the soils can be transported to waterways through excess irrigation or stormwater runoff. There are approximately 23 golf courses within the watershed area.

METALS

Heavy metals including copper, lead, and zinc are Category 1 pollutants in the Lower SGR Watershed. Although naturally occurring, concentrations of these metals are a concern in many watersheds because of potential industrial and urban discharges. These types of sources include Industrial General

Permit (IGP) covered facilities, Construction General Permit (CGP) covered facilities, and other types of urban activities.

INDUSTRIAL GENERAL PERMIT ACTIVITIES

The types of facilities covered under the IGP have the potential for metal loads, in particular metal plating, transportation, scrap yards and recycling and manufacturing facilities.

According to the Storm Water Multiple Application and Report Tracking System (SMARTS) database, there are approximately 360 current active industrial permits within the watershed; and from 2002-2012 there have been approximately 471 combined, active/terminated, industrial permits. Approximately 204 violations were recorded on the SMARTS database for inspections conducted from 2002-2012. No further data is available to determine the kind of violations or the kind of pollutants these facilities contributed to.

Table 2-14 Active IGP Facilities as of May 1, 2014

Agency	Total
Artesia	3
Bellflower	1
Cerritos	8
Diamond Bar	0
Downey	22
Hawaiian Gardens	0
La Mirada	22
Lakewood	1
Long Beach	78
Norwalk	15
Pico Rivera	12
Santa Fe Springs	176
Whittier	22
Total	360

CONSTRUCTION GENERAL PERMIT ACTIVITIES

Discharges covered under the CGP also have the potential to contribute metals loading from construction sites. Sediment delivered from construction sites can contain metals from construction materials and heavy equipment. Additionally, metals can leach out of building materials and construction waste exposed to stormwater[20].

Pollutants sources from construction activities are not considered a major concern since the watershed is mainly built-out. However, according to the SMARTS database, there are approximately 127 current active constructions permits within the watershed; and from 2002-2012 there have been approximately 470 combined, active/inactive, construction permits. Approximately 36 violations were recorded on the SMARTS database for inspections conducted from 2002-2012. No further data is available to determine the kind of violations or the kind of pollutants these facilities contributed to.

[20] Raskin, L., M.J. Singer, and A. DePaoli. 2004. Final Report to the State Water Resources Control Board Agreement number 01-269-250. University of California, Davis, CA.

Table 2-15 Active CGP Facilities as of May 1, 2014

Agency	Total
Artesia	1
Bellflower	5
Cerritos	5
Diamond Bar	10
Downey	7
Hawaiian Gardens	2
La Mirada	4
Lakewood	3
Long Beach	4
Norwalk	8
Pico Rivera	9
Santa Fe Springs	10
Whittier	18
Total	86

LAND USE ACTIVITIES

These include general wear and tear of automotive parts which can be a significant source of metals. For example, brake wear can release copper, lead, and zinc into the environment and this contributes to concentrations of metals in urban runoff. Motor oil and automotive coolants spills are another potential land use source of metals. Pesticides, algaecides, wood preservatives, galvanized metals, and paints used across the watershed can also contain these metals. In the watershed, sources for these heavy metals have been identified as automotive repair, maintenance, fueling, cleaning and painting locations, metal fabrication facilities, and transportation activities and facilities.

The fertilizers used for lawn and landscape maintenance are also a source of metals and organic chemicals. Fertilizers, herbicides, and pesticides contain metals such as cadmium, copper, mercury, zinc, lead, iron, and manganese, which are also distributed when applying fertilizers and pesticides.

2.3.2 ROAD INFRASTRUCTURE SOURCES

Runoff from highways and roads carries a significant load of pollutants. Pollutants originate from cars, roadway degradation, and surrounding landscape. Typical contaminants associated with these include sediment, heavy metals, oils and grease, debris, fertilizers, and pesticides, among others[21]. The use and wear of cars is one of the most prevalent sources of roadway pollutants. A study found that cars are the leading source of metal loads in stormwater, producing over 50 percent of copper, cadmium, and zinc loads[22]. Vehicle brake pads constitute the single largest source of copper[23]. Simultaneously, tires, and engine parts are also a significant source of metals pollutants; almost 50 percent of tire wear accounts

[21] Caltrans (California Department of Transportation). 2003. *Discharge characterization study report*. California Department of Transportation, Sacramento, CA.
[22] Schueler, T., and H.K. Holland. 2000. *The Practice of Watershed Protection*. Center for Watershed Protection, Ellicott City.
[23] TDC Environmental 2004, *Copper Sources in Urban and Shoreline Activities*. San Francisco, CA.

for over 50 percent of the total cadmium and zinc loads[24]. Roadways can also be a source of nutrients because nutrients are found in fertilizers that are commonly applied.

Table 2-16: Typical Sources of Pollutants from Road Infrastructure

Source	Cadmium	Chromium	Copper	Iron	Nickel	Lead	Zinc	PAHs	Nutrients	Synthetic Organic Chemicals
Gasoline	●		●			●	●			
Exhaust					●	●		●		●
Motor oil and grease				●	●	●	●	●		
Antifreeze	●	●	●	●		●	●	●		
Undercoating						●	●			
Brake Linings			●	●	●	●	●			
Tires	●		●			●	●	●		
Asphalt	●		●		●		●	●		
Concrete			●		●		●			
Diesel Oil	●	●				●	●			●
Engine wear				●	●	●	●			
Fertilizers, pesticides, and herbicides	●		●	●	●		●		●	●

2.3.3 ATMOSPHERIC DEPOSITION

Atmospheric deposition is the direct and indirect transfer of pollutants from the air to surface waters. Pollutants in the atmosphere deposit onto solid surfaces and can then be washed off by rain, becoming part of the stormwater runoff that reaches the MS4. Atmospheric deposition of pollutants can be a large source of contamination to surface waters. Typical pollutants associated with atmospheric deposition are metals, PAHs, PCBs, and, to a lesser extent, nutrients. These pollutants enter the atmosphere from point sources (i.e., industrial facility emitting metals into the air). A comparison of trace metals contributions from aerial deposition, sewage treatment plans, industrial activities, and power plants is shown in Table 2-17.

Table 2-17 Comparison of source annual loadings to Santa Monica Bay (metric tons/year)

Metal	Aerial Deposition	Non-Aerial Sources		
		Sewage Treatment Plants	Industrial	Power Plants
Chromium	0.5	0.6	0.02	0.14
Copper	2.8	16	0.03	0.01
Lead	2.3	<0.01	0.02	<0.01
Nickel	0.45	5.1	0.13	0.01
Zinc	12.1	21	0.16	2.4

[24] Davis A.P., M. Shokouhian, and S. Ni. 2001. Loading estimates of lead, copper, cadmium, and zinc in urban runoff from specific sources. *Chemosphere.*

In addition to the pollutants listed above, nutrients are also atmospherically deposited. The annual loading of nitrogen through atmospheric deposition in the neighboring Los Angeles River watershed is 5,559 tons per year, with 845 tons per year in the neighboring Ballona Creek watershed.[25]

2.3.4 SANITARY SEWERS AND SEPTIC SYSTEMS

Sanitary sewer systems and septic systems are potential sources of contaminants. Aging systems in need of repair or replacement, severe weather, improper system operation and maintenance (O&M), clogs, and root growth can contribute to sanitary sewer leaks and overflows. When sanitary sewers overflow or leak, they can release raw sewage into the environment, which can contain pollutants such as suspended solids, pathogenic organisms, toxic pollutants, oil and grease but in particular, high concentrations of bacteria and nutrients.[19]

According to the SSO database in the California Integrated Water Quality System (CIWQS) a total of 198 SSOs have been recorded within the watershed since 2006. Table 2-18 includes information on the total reported SSO discharges.

Table 2-18 SSO Total and Volume

Total SSOs	Total Volume (gal)
418	206,344

[25] Lu, R., K. Schiff, S. Solzenbach, and D. Keith. 2004. *Nitrogen Deposition on Coastal Watersheds in the Los Angeles Region*. Southern California Coastal Water Research Project Annual Report. 2003-2004. pp. 73– 81.

2.3.5 SUMMARY

Typical sources of these pollutants are summarized in Table 2-19.

Table 2-19 Typical Sources of Pollutants

Potential Source	Pollutants				Key References
	Bacteria	Nutrients	Metals	TSS/ Turbidity	
NPDES Sources					
Residential land areas	●	●		●	1, 2, 3, 4, 5, 6, 7, 8, 9
Agricultural activities (i.e., animal operations, land applications)	●	●		●	7,8,9
Metallurgical industries/activities			●		7, 10
Construction activities			●	●	7, 9
Industrial/municipal activities	●		●		6, 11
POTW discharges			●		12
Landscaping, fertilizers		●			7, 9
Homeless encampments	●				13
Pet waste	●	●			9,
Wildlife	●				7, 1
Native geology		●	●		7, 1
Land surface erosion			●	●	7
Detergents		●			9
Car washing				●	7, 9
Road Infrastructure					
Transportation sources (i.e., copper brake pads, tire wear)			●		7, 9, 14, 15
Pavement erosion			●	●	7, 16
Atmospheric Deposition					
Industrial activities			●		7, 10
Construction activities			●		7, 9
Roofing			●		7
Resuspension of historic emissions in road dusts and soil particles			●		17
Land surface erosion		●			18
Sanitary Sewer and sanitary sewer overflows (SSOs)					
Sewer Leaks, SSOs, illicit discharges, septic systems	●	●		●	7, 5, 19
POTW discharges		●	●		12

1. LARWQCB (Los Angeles Regional Water Quality Control Board). 2002 & 2006. Total Maximum Daily Load to Reduce Bacterial Indicator Densities at Santa Monica Bay Beaches During Wet Weather. California Regional Water Quality Control Board, Los Angeles Region, Los Angeles, CA.
2. City of San Diego. 2009. *Aerial Deposition Study, Phase III*. Source Evaluation of TMDL Metals in the Chollas Creek Watershed. Final Report. San Diego, CA.
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4. San Diego County. 2011. 2009-2010 *Urban Runoff Monitoring Annual Report*. January 2011.
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7: County of Los Angeles. 2010. *Multi-pollutant TMDL Implementation Plan for the Unincorporated County Area of Los Angeles River Watershed*. County of Los Angeles, Los Angeles, CA
8: City of San Diego. 2011. *Mission Bay and La Jolla Watershed Urban Runoff Management Program*. Fiscal Year 2010 Annual Report.
9: USEPA (U.S. Environmental Protection Agency). 2011. *Sanitary sewer overflows and peak flows*.
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11: Gregorio, D., and S.L. Moore, 2004. *Discharge into state water quality protection areas in southern California*. http://www.sccwrp.org/Homepage/RecentPublications.aspx
12: Sabin, L.D., K.C. Schiff, J. Hee Lim, and K.D. Stolzenback. 2004. *Atmospheric dry deposition of trace metals in the Los Angeles coastal region*. Southern California Coastal Research Project, Costa Mesa, CA.
13: City of San Diego. 2009. *Tecolote Creek Microbial Source Tracking Study*. Phase II. Final. June 30, 2009. San Diego, CA.
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15: Stein, E.D., L.L. Tiefenthaler, and K. Schiff. 2006. Watershed-based Sources of Polycyclic Aromatic Hydrocarbons in Urban Stormwater. *Environmental Toxicology and Chemistry* 25(2):373–385
16: Caltrans (California Department of Transportation). 2003. *A Review of the Contaminants and Toxicity Associated with Particles in Stormwater runoff*. August 2003.
17: Sabin, L. and K. Schiff. 2007. *Metal Dry Deposition Rates along a Coastal Transect in Southern California*. Technical Report #509. Southern California Coastal Research Project, Costa Mesa, CA
18: Sutula, M., K. Kamer, and J. Cable. 2004. *Sediment as a nonpoint source of nutrients to Malibu Lagoon, California*. Southern California Coastal Research Project. Technical Report.
19: SWRCB (State Water Resources Control Board). 2011. NPDES Permits (including Stormwater). Excel spreadsheet download. Accessed December 6, 2011.

2.4 PRIORITIZATION

Section VI.C.5.a.iv of the MS4 Permit outlines factors that should be considered when developing the sequence of addressing pollutants of concern within the Lower SGR Watershed. Based on the source assessment analysis, Water Quality Priorities (WQPs) within the watershed have been determined based on the following:

- Highest WQPs: TMDLs
    - TMDL pollutants with past due interim or final limits
    - TMDL pollutants with interim and final limits that fall within the MS4 Permit term, or the time period: September 6, 2012 – October 25, 2017
    - Pollutants that are in the same class as a TMDL pollutant
- High WQPs: other receiving water considerations
    - Pollutants on the 303(d) List for which MS4 discharges are a suspected source based on findings from the source assessment
    - Pollutants that exceed receiving water limitations and the findings from the source assessment indicate the MS4 as a source (these pollutants will be evaluated based on monitoring data collected as part of the CIMP).
- All Category 1 pollutants with TMDL compliance deadlines that are past due, or that fall within the MS4 Permit term are prioritized as a Highest WQP. In addition, pollutants that fall within the same class (as defined in Section 2.1) as a TMDL pollutant with a compliance deadline that is past due or falls within the MS4 Permit term are prioritized as a Highest WQP. All other pollutants that are associated with the MS4 (based on the Source Assessment in Section 2.3) are prioritized as a High WQP. Table 2-20 summarizes the WQPs for the watershed based on the criteria described above.

Table 2-20: Priority Pollutants

Category	Class	Pollutant	Waterbody	Associated with MS4	Priority
1	Metals	Copper	San Gabriel Reach 1, Coyote Creek	Yes	Highest
		Lead	San Gabriel River Reach 2, Coyote Creek, and San Jose Creek Reach 1	Yes	Highest
		Zinc	Coyote Creek	Yes	Highest
		Seleniu	San Jose Creek Reach 1	UTD[a]	Highest
	Bacteria	*E. Coli*	San Gabriel River Reach 1, San Gabriel River Reach 2, San Gabriel River Reach 3, San Jose Creek Reach 1, North Fork Coyote Creek and Coyote Creek	Yes	Highest
2	Nutrients	Ammonia	San Jose Creek Reach 1 and Coyote Creek	Yes	High
	Metals	Copper	San Gabriel River Reach 2, North Fork Coyote Creek, San Jose Creek Reach 1	Yes	Highest
		Lead	Coyote Creek	Yes	Highest
		Mercury	North Fork Coyote Creek	UTD	Highest
		Nickel	Coyote Creek	UTD	Highest
		Selenium	North Fork Coyote Creek	UTD	Highest
		Zinc	San Gabriel River Reach 2, San Jose Creek Reach 1, Coyote Creek	Yes	Highest
	Pesticides	Diazinon	Coyote Creek	Yes	High
	SVOC	PAHs	San Gabriel River Reach 2, San Jose Creek Reach1	Yes	High
	Water Quality Indicators/ General	Chloride	San Jose Creek Reach 1	UTD	High
		Cyanide	Coyote Creek, San Gabriel Reach 2	UTD	High
		pH	San Gabriel Reach 1, Coyote Creek, and San Jose Reach 1	UTD	High
		Total Dissolved Solids	San Jose Creek Reach 1	Yes	High
		Toxicity	Coyote Creek, San Jose Creek Reach 1	Yes	High
3	Metals	Copper	North Fork Coyote Creek	Yes	Highest
		Selenium	San Gabriel River Reach 1	UTD	Highest
	Water Quality Indicators/ General	Chloride	San Gabriel River Reach 2, San Jose Creek Reach 1, Coyote Creek	UTD	High
		Cyanide	North Fork Coyote Creek, San Jose Creek Reach 1	UTD	High
		Dissolved Oxygen	San Gabriel River Reach 1 & 2, Coyote Creek, San Jose Creek Reach 1	UTD	High
		MBAS	Coyote Creek, San Gabriel River Reach 2	UTD	High
		Sulfates	San Gabriel River Reach 2, San Jose Creek Reach 1	UTD	High
		Total Dissolved Solids	San Gabriel River Reach 2	Yes	High
		pH	North Fork Coyote Creek	UTD	High
		Alpha-Endusulfan	Coyote Creek	UTD	High
	Pesticides	Lindane	San Gabriel River Reach 2	UTD	High

[a] UTD – Unable to Determine at this time

REFERENCES

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2. Environmental Protection Agency. Nickel Compounds, January 2000. Web. October 2013. <http://www.epa.gov/ttnatw01/hlthef/nickel.html>.
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5. Los Angeles Department of Public Works. Stormwater Monitoring Reports, 2002-2012. Web. October 2013. <http://dpw.lacounty.gov/wmd/NPDES/report_directory.cfm>.
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3 SELECTION OF WATERSHED CONTROL MEASURES

This chapter identifies Watershed Control Measures (WCMs) to implement through the Participating Agencies' jurisdictional stormwater management programs, and collectively on a watershed scale. The WCMs are structural and/or nonstructural controls designed with the following objectives:

- Prevent or eliminate non-stormwater discharges to the MS4 that are a source of pollutants from the MS4 to receiving waters.
- Implement pollutant controls necessary to achieve all applicable interim and final water quality-based effluent limitations and/or receiving water limitations pursuant to corresponding compliance schedules.
- Ensure that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations.

The goal is to create an efficient program that focuses individual and collective resources on water quality priorities (WQPs). The WCMs are categorized as

- Minimum Control Measures (MCMs),
- Non-stormwater Discharge (NSWD) Measures and
- Targeted Control Measures (TCMs), which are designed to achieve applicable water quality-based effluent limitations and receiving water limitations.

Each WCM category may be further categorized as either structural or nonstructural (nonstructural includes operation and maintenance procedures and pollution prevention measures) as well as either existing or proposed. Combined with Chapter 4 (RAA) and Chapter 5 (Compliance Schedules), the WMP includes the nature, scope and timing of implementation for each WCM and provides interim milestones for the WCMs to achieve TMDL compliance. Also included are the responsibilities of each Permittee.

3.1 STRATEGY FOR SELECTION AND IMPLEMENTATION OF WATERSHED CONTROL MEASURES

Pursuant to Part VI.C.1.a of the MS4 Permit (Part VII.C.1.a - LB Permit), the Watershed Group has developed customized strategies, control measures and BMPs to implement the requirements of the MS4 Permit. Addressing WQPs will be based on a multi-faceted strategy initially focused on source control, including total suspend solids (TSS) reduction and runoff reduction. If pollutants are not generated or released, they will not be available for transport to the receiving waters. In addition, if soils can be stabilized, sediment controlled, and dry-weather runoff and initial flushes of stormwater runoff eliminated or greatly reduced, the major transportation mechanisms will be eliminated or greatly reduced, and fewer pollutants will reach the receiving waters.

The Watershed Group is particularly focused on source control because major sources of many of the highest WQPs, such as copper, lead and zinc, are released into the atmosphere, resulting in widespread

aerial deposition onto impervious surfaces in the Watershed. In addition, these pollutants are discharged directly onto streets, highways, parking lots, and driveways from motor vehicle components such as brakes, wheel weights, and tires. The Participating Agencies have concluded that the most cost-effective and long-lasting way to address WQPs is to develop and support state-wide or regional measures that will encourage or require, if necessary, product or material substitution at the manufacturing stage. This can be a complex and time-consuming process, but the payoff in water quality improvement can be tremendous.

For example, the recent efforts of the California Stormwater Quality Association (CASQA) and Sustainable Conservation that led to the passage of the SB 346 legislation is a milestone that will significantly reduce the level of copper in metropolitan area waters throughout the state. SB 346 requires incremental reduction in the amount of copper in vehicle brake pads, which constitute the single largest source of copper in metropolitan environments. Based on available information, which was largely developed through a lengthy collaboration among brake pad manufacturers, government agencies, and environmental groups in the Brake Pad Partnership, a preliminary estimate of copper runoff reduction due to this piece of legislation was developed[1]. The estimate examined three scenarios and determined a 45- 60% reduction in copper in runoff could be attributed to reduction of its use in brake pads. Already in effect, new edge codes required on brake pads sold in California will provide information on copper content and a notice that on and after January 1, 2014 any motor vehicle brake friction materials sold in California must contain no more than 0.1 percent by weight of the following materials: cadmium and its compounds, chromium (VI) salts, lead and its compounds, mercury and its compounds, and asbestiform fibers.

In addition, the Department of Toxic Substances Control (DTSC) adopted new Safer Consumer Product Regulations that became effective October 1, 2013. These regulations contain a process for identifying and prioritizing Chemicals of Concern in Priority Products containing these constituents, as well as a process for eliminating or reducing the adverse impacts of Chemicals of Concern in Priority Products. It will apply to most consumer products placed into the stream of commerce in California. It specifically applies to adverse environmental impacts, including adverse water quality impacts, and it contains a petition process for identification and prioritization of chemicals and projects. CASQA, supported by Watershed Group, has started the process of conducting research and building a file of critical information to support the designation of zinc in tires as a future priority product/constituent combination.

As explained later in this chapter, many of the new requirements of the MS4 Permit also involve enhanced source control measures that will be implemented such as enhanced inspections programs and outfall screening measures. The *Targeted Control Measures* section of this chapter supplements these efforts with targeted source control measures such as incentives for irrigation control and upgraded street sweeping equipment, designed with the objective of achieving interim and final water quality-based effluent limitations and/or receiving water limitations.

[1] Based on the Los Cerritos Channel Watershed Group commissioned study, "Estimate of Urban Runoff Copper Reduction in Los Angeles County from the Brake Pad Copper Reductions Mandated by SB 346."

In concert with these initial source control efforts, which constitute 10% of the load reduction in the RAA (higher reductions may be realized), structural controls will also be implemented. The MS4 Permit mandates implementation of structural LID BMPs for certain classes of new developments and roadway projects. In addition, the *Targeted Control Measures* section of this chapter describes supplemental targeted structural BMPs. These structural controls are used to meet the load reduction requirements and structural BMP capacities for each participating agency as noted in Chapter 4 (the RAA) following the schedules provided for each agency in Chapter 5 (Compliance Schedules).

3.2 MINIMUM CONTROL MEASURES

The Minimum Control Measures (MCMs) are baseline WCMs required for all Permittees. The MCMs are defined in the MS4 Permit (excluding modifications set forth in an approved WMP) and are generally implemented individually by each Permittee. The objectives of the MCMs are to 1) result in a significant reduction in pollutants discharged into receiving waters and 2) satisfy the requirements of 40 CFR §122.26(d)(2)(iv). The MCMs are separate from Targeted Control Measures, which are developed by the Watershed Group and included in the WMP to specifically address WQPs.

The MS4 Permit allows the modification of several MCMs programs, so long as the modified actions are set forth in the approved WMP and are consistent with 40 CFR §122.26(d)(2)(iv). The modifications are based on an assessment to identify opportunities for focusing resources on WQPs. The term "modifications" refers only to instances where language from the MS4 Permit MCM provisions is removed and/or replaced. Any control measures that are strictly enhancements of the existing programs (i.e. do not conflict with the MS4 Permit MCM provisions) are included in the separate category of Targeted WCMs.

The following sections include a summary of the assessment of each MCM program as well as a determination as to whether each Participating Agency will implement the MCM provisions 1) as explicitly stated in the corresponding section of the MS4 Permit or 2) with modifications to focus resources on WQPs. Independent of the determinations made, the Agencies may consider additional MCM modifications through the Adaptive Management Process. Implementation of the MCMs will follow the approval of this WMP by the Regional Board Executive Officer following MS4 Permit §VI.D.1.b (LB Permit - §VII.D.1.ii).

3.2.1 LOS ANGELES COUNTY FLOOD CONTROL DISTRICT MINIMUM CONTROL MEASURES

The LACFCD will implement the MCMs as defined from §VI.D.1 to §VI.D.4 of the MS4 Permit.

3.2.2 ASSESSMENT OF MINIMUM CONTROL MEASURES (CITIES ONLY)

Pursuant to MS4 Permit §VI.C.5.b.iv.(1).(a) (LB Permit - §VII.C.5.h.i), the following section is an assessment of the MS4 Permit MCMs, intended to identify opportunities for focusing resources on WQPs.

3.2.2.1 DEVELOPMENT CONSTRUCTION PROGRAM

ASSESSMENT

Although controlling sediment is not a WQP, the reduction of sediment through an effective Development Construction Program will address WQPs. This is because sediment mobilizes other pollutants, including many of the WQP pollutants. As such the Development Construction Program is an integral component of each City's jurisdictional stormwater management program.

Compared to the prior MS4 Permit, the current Permit expands the provisions for the Development Construction Program. This expansion includes additional or enhanced requirements for plan review, site tracking, inspection frequencies, inspection standards, BMP implementation and employee training. If implemented effectively, these enhancements will aid in the control of sediment within the Watershed, and consequently, will address WQPs. As such, no modifications to the provisions of the Development Construction Program have been identified.

DETERMINATION

The Cities will implement the MCMs as defined in §VI.D.8 of the MS4 Permit (§VII.D.K of the LB Permit). To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Appendix A-3-1.

3.2.2.2 INDUSTRIAL/COMMERCIAL FACILITIES PROGRAM

ASSESSMENT

The MS4 Permit provisions for the Industrial/Commercial Facilities Program provide opportunities for customization to address WQPs. Specifically, §VI.D.6.e.i.4 (§VII.D.G.5.i.4 - LB Permit) states that industrial inspection frequencies may be modified through the WMP development process. The Cities propose modifying the inspection frequencies of both industrial and commercial facilities based on a facility prioritization scheme that considers WQPs. For example, facilities that are deemed to have a high potential to discharge metals (a WQP pollutant) may be prioritized as "High" and inspected more frequently while facilities that have a small likelihood to adversely impact WQPs may be prioritized as "Low" and inspected less frequently.

DETERMINATION

Sections VI.D.6.d and VI.D.6.e of the MS4 Permit (Sections VII.D.G.4 and VII.D.G.5 of the LB Permit) will be replaced with the language in Table 3-3, which is located in the following *New Fourth Term Permit MCMs* section of this chapter and is identified as MCM-ICF-3.

In order to provide clarity to the Cities, one combined guidance document has been prepared for the Program, with the prioritization and revised inspection frequencies included – see Appendix A-3-1. The document is also intended to assist the Cities in the development and implementation of a jurisdictional program.

3.2.2.3 ILLICIT CONNECTION AND ILLICIT DISCHARGES ELIMINATION PROGRAM

ASSESSMENT

The purpose of the Illicit Connection and Illicit Discharges Elimination (ICID) Program is to detect, investigate and eliminate IC/IDs to the MS4. In order to address WQPs, a potential modification to MS4 Permit provisions would be the inclusion of a proactive approach for the detection of illicit discharges. However such an approach will be addressed through non-stormwater outfall based screening monitoring as outlined in the MRP. Also, such activities do not conflict with the MS4 Permit provisions for an IC/ID Program, and as such would be classified as a Targeted Control Measure. As such there is no need to modify the base provisions of the program.

DETERMINATION

The Cities will implement the MCMs as defined in §VI.D.10 of the MS4 Permit (§VII.D.M of the LB Permit). To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Appendix A-3-1.

3.2.2.4 PLANNING AND LAND DEVELOPMENT PROGRAM

ASSESSMENT

Following MS4 Permit §VI.C.5.b.iv.1.a (LB Permit - §VII.C.5.h.i.), the Planning and Land Development Program was not assessed for potential modifications.

DETERMINATION

The Cities will implement the MCMs as defined in §VI.D.7 of the MS4 Permit (§VII.D.J of the LB Permit). To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Appendix A-3-1.

3.2.2.5 PUBLIC AGENCY ACTIVITIES PROGRAM

ASSESSMENT

The Public Agency Activities Program is divided into several sub-programs. Many of the MS4 Permit provisions within the sub-programs consist of baseline BMPs that do not suggest modification. The sub-

programs that do suggest a prioritized approach – such as street sweeping and catch basin cleaning frequencies – already provide this opportunity (frequencies are based on a City's assessment of trash and debris generation). The Public Facility Inventory sub-program also provides a prioritization opportunity, based on the tracking data obtained for each facility. However, since these facilities are not subject to regular "public agency" inspections as in the Industrial/Commercial Facilities Program, there is little utility in incorporating such a prioritization. The provisions of the public construction activities sub-program are considered an integral component of the jurisdictional stormwater program, for the reasons explained in the assessment of the Development Construction Program provisions. In summary there is no need to modify the MS4 Permit provisions of the program.

DETERMINATION

The Cities will implement the MCMs as defined in §VI.D.9 of the MS4 Permit (§VII.D.L of the LB Permit). To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Appendix A-3-1.

3.2.2.6 PUBLIC INFORMATION AND PARTICIPATION PROGRAM

ASSESSMENT

The MS4 Permit allows a City to implement the requirements of the Public Information and Participation Program (PIPP) 1) by participating in a County-wide effort, 2) by participating in a Watershed Group effort, 3) individually within its jurisdiction or 4) through a combination of these approaches. The Cities will implement the PIPP following a combination of approaches. Consequently some clarifications of the MS4 Permit provisions are necessary.

In terms of modifications to address WQPs, the MS4 Permit provisions for the PIPP are not particularly prescriptive, thus allowing the Cities the flexibility to focus efforts on WQPs through the development of the program. As such, there is no need to modify the MS4 permit provisions of the program.

DETERMINATION

The table below provides clarification on elements of the MS4 Permit provisions for the PIPP:

Permit section	Clarification
§VI.D.5.c.(i) - MS4 Permit §VII.D.F.3.i - LB Permit Public Participation	Each City will participate in a County-wide sponsored PIPP to provide a means for public reporting of clogged catch basin inlets and illicit discharges/dumping, faded or missing catch basin labels, and general stormwater and non-stormwater pollution prevention information.
§VI.D.5.d - MS4 Permit §VII.D.F.4- LB Permit Residential Outreach Program	Each City will work in conjunction with a County-wide sponsored PIPP to implement the Residential Outreach Program. Elements of the program that will not be administered or implemented as a county-wide effort (currently the provision to provide educational materials to K-12 school children) will be addressed individually by each City or jointly on a watershed level. Through the adaptive management process, PIPP participation may develop into a watershed group or individual effort, or some combination of these approaches.

In order to provide clarity to the Cities, one combined guidance document has been prepared for the Program, with the approach for each provision (i.e. joint or individual effort) included – see Appendix A-3-1. The document is also intended to assist the Cities in the development and implementation of a jurisdictional program.

3.2.2.7 PROGRESSIVE ENFORCEMENT AND INTERAGENCY COORDINATION

ASSESSMENT

Following MS4 Permit §VI.C.5.b.iv.1.a (LB Permit - §VII.C.5.h.i), the Progressive Enforcement and Interagency Coordination Program was not assessed for potential modifications.

DETERMINATION

The Cities will implement the MCMs as defined in §VI.D.2 of the MS4 Permit (§VII.D.2 of the LB Permit). To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Appendix A-3-1.

3.2.3 THIRD TERM PERMIT MCMS

Until the WMP is approved by the Executive Officer of the Regional Board, the MCM provisions of the prior third term MS4 permit continue to be implemented by the participating agencies. Some of the MCMs of the current MS4 Permit are relatively unchanged carry-overs from the prior third term permit. The remaining MCMs are either enhancements of the third term MCMs or entirely new provisions. These new and enhanced fourth term MCMs are described in the following section.

3.2.4 NEW FOURTH TERM PERMIT MCMS (CITIES ONLY)

Part VI.D of the MS4 Permit and Part VII.D of the LB Permit (the MCM provisions) introduces many new provisions and program elements to be developed and incorporated within each participating agency's jurisdictional stormwater program. This section briefly describes the new and enhanced MCMs required for the Cities (City MCMs), excluding those required for the LACFCD in §VI.D.4. An MCM is considered new if it was not required by the prior MS4 Permit and is considered enhanced if it is an enhancement of a related provision of the prior MS4 Permit.

The details of each provision may be found in the relevant sections of the MS4 Permit, which are included. Unless an alternate date is provided in the MS4 Permit or in this section, the adoption date for the City MCMs coincides with the approval of the WMP by the Regional Board's Executive Officer.

3.2.4.1 STRUCTURAL CONTROLS

The new and enhanced MCMs consist primarily of nonstructural control measures, with the marked exception of the Planning and Land Development provisions, described as follows.

LID AND HYDROMODIFICATION

MS4 Permit §VI.D.7 (LB Permit §VII.D.J)

The LID and hydromodification provisions of the Planning and Land Development program are a significant enhancement from the prior MS4 Permit. The implementation of structural LID BMPs at new developments throughout the watershed will appreciably decrease the effective impervious area, reducing flow and, consequently, pollutant loads. The program is unique in that it will increase in effectiveness over time as more and more existing developments are redeveloped and bound to the LID/hydromodification requirements.

TRASH EXCLUDER INSTALLATION

MS4 Permit §VI.D.9.h.vii.(1) (LB Permit §VII.D.L.8. vii.(1))

In areas that are not subject to a trash TMDL, the Public Agency Activities Program includes a requirement to install excluders (or equivalent devices) on or in Priority A (MS4 Permit §VI.D.9.h.iii.(1)), LB Permit §VII.D.L.8. iii.(1)) area catch basins or outfalls to prevent the discharge of trash to the MS4. For LA MS4 Permittees, the deadline is no later than four years after the effective date of the Permit. This provision may be supplanted by the statewide trash amendments, which in their current draft iteration include the installation of full-capture devices in the priority land use areas of high density residential, industrial, commercial, mixed urban and public transportation stations as a compliance route.

3.2.4.2 NONSTRUCTURAL CONTROLS

Table 3-2 lists the new and enhanced nonstructural City MCMs as well as the new and enhanced NSWD measures. The BMP effectiveness from Table 3-2 is based on similar BMPs listed in Tetra Tech's Comprehensive Load Reduction Plan (CLRP) for Chollas Creek Watershed in San Diego County, 2012. The correlation of BMP effectiveness with WQPs is based on Table 3-1. The pages following Table 3-2 describe each of the listed controls.

Table 3-1 Pollutant Category versus Water Quality Classification

Waterbody-pollutant classification	Type of pollutant								
	Bacteria	Metals	Organics	Sediment	Pesticides	Nutrients	Oil and grease	Dissolved minerals	Trash
Category 1	✗	✗						✗	
Category 2		✗	✗	✗	✗	✗		✗	
Category 3			✗					✗	

Table 3.2 Fourth Term MS4 Permit Nonstructural MCMs (Cities only) and NSWD Measures

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency												
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Artesia	Bellflower	Cerritos	Diamond Bar	Downey	Hawaiian Gardens	Lakewood	La Mirada	Long Beach	Norwalk	Pico Rivera	Santa Fe Springs	Whittier
		Planning and Land Development																		
1	MCM-PLD-1	Amend development regulations to facilitate LID implementation	◈	◆	◈	◆	◆	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
2	MCM-PLD-2	Post-construction BMP tracking, inspections and enforcement	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
		Existing Development																		
3	MCM-ICF-1	Increase in facility types inspected and number of inspections conducted	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
4	MCM-ICF-2	Business assistance program and BMP notification	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
5	MCM-ICF-3 (TCM-ICF-1)	Prioritize facilities/inspections based on water quality priorities	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
		Construction																		
6	MCM-DC-1	Enhanced plan review program	◈	◈	◈	◆	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
7	MCM-DC-2	Enhanced inspection standards and BMP requirements	◈	◈	◈	◆	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

Table 3.2 Fourth Term MS4 Permit Nonstructural MCMs (Cities only) and NSWD Measures

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency												
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Artesia	Bellflower	Cerritos	Diamond Bar	Downey	Hawaiian Gardens	Lakewood	La Mirada	Long Beach	Norwalk	Pico Rivera	Santa Fe Springs	Whittier
8	MCM-DC-3	Increased inspection frequencies	◈	◈	◈	◆	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
9	MCM-TRA-1	Enhanced staff training program	◈	◈	◈	◆	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
		Illicit Discharge Detection/Elimination																		
10	MCM-ICID-1	Enhanced IC/ID enforcement and written procedures	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
11	NSWD-1	Outfall screening and source investigations	◈	◈	◈	◈	◆	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
12	MCM-TRA-1	Enhanced staff/contractor training	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
		Dry weather runoff reduction																		
13	NSWD-1	Outfall screening and source investigations	◈	◈	◈	◈	◆	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
14	NSWD-2	Enhanced conditions for NSWDs, including irrigation reduction	◈	◆	◈	◆	◆	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
		Public Information and Participation																		

Table 3.2 Fourth Term MS4 Permit Nonstructural MCMs (Cities only) and NSWD Measures

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency												
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Artesia	Bellflower	Cerritos	Diamond Bar	Downey	Hawaiian Gardens	Lakewood	La Mirada	Long Beach	Norwalk	Pico Rivera	Santa Fe Springs	Whittier
15	MCM-PIP-1	Stormwater resources on City website	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
		Public Agency Activities																		
16	MCM-PAA-1	Enhanced BMP requirements for fixed facility/field activities	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
17	MCM-PAA-2	Reprioritization of catch basins and clean-out frequencies	◆	◆	◇	◆	◇	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
18	MCM-PAA-3	Integrated Pest Management Program	◈	◈	◈	◇	◇	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
19	MCM-PAA-4	Enhanced measures to control infiltration from sanitary sewers	◇	◆	◇	◇	◇	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
20	MCM-PAA-5	Inspection and maintenance of Permittee owned treatment controls	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
21	MCM-TRA-1	Enhanced inspector/staff training	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

✗ – To be implemented by agency within current MS4 Permit term. MCM – Minimum Control Measure. NSWD – Non-stormwater discharge measure.

◆ Primary pollutant reduction ◈ Secondary pollutant reduction ◇ Pollutant not addressed

BMP effectiveness ratings based on similar BMPs listed in Tetra Tech's CLRP for Chollas Creek Watershed in San Diego County, 2012.

ENHANCED STAFF/CONTRACTOR TRAINING PROGRAMS ***MCM-TRA-1***

MS4 Permit §VI.D.7.d.iv.(b), §VI.D.8.l, §VI.D.9.k, §VI.D.10.f (LB Permit §VII.D.J.5.iv.(b), §VII.D.K.xiv, §VII.D.L.11, §VII.D.M.6)

Measures introduced:

- Prescriptive staff training requirements to the Development Construction, Illicit Connections and Illicit Discharges Elimination and Public Agency Activities Programs. For example, relevant staff involved with the Construction Program must be knowledgeable in procedures consistent with the State Water Board sponsored Qualified SWPPP Practitioner/Developer (QSP/QSD) program.
- Inspections of structural BMPs under the Planning and Land Development Program must be conducted by trained personnel.
- Outside contractors are bound to the same training standards as in-house staff

These new and enhanced provisions will increase the overall effectiveness of the JSWMPs.

AMEND DEVELOPMENT REGULATIONS TO FACILITATE LID IMPLEMENTATION ***MCM-PLD-1***

MS4 Permit §VI.C.4.c.i, §VI.D.7.d.i (LB Permit §VII.C.4.c.i, §VII.D.J.5.i)

The participating agencies have developed and adopted LID ordinances and Green Street Policies. These measures will facilitate LID implementation.

POST-CONSTRUCTION BMP TRACKING, INSPECTIONS AND ENFORCEMENT ***MCM-PLD-2***

MS4 Permit: §VI.D.7.d.iv (LB Permit §VII.D.J.5.iv)

The Cities must track post-construction BMPs, conduct BMP verification and maintenance inspections and follow the Progressive Enforcement Policy in cases of non-compliance. This will improve the effectiveness of the Planning and Land Development program.

INCREASE IN FACILITY TYPES INSPECTED AND NUMBER OF INSPECTIONS CONDUCTED ***MCM-IFC-1***

MS4 Permit: §VI.D.6.d, §VI.D.6.e (LB Permit §VII.D.G.4, §VII.D.G.5), also affected by NPDES No. CAS000001, the State Water Resources Control Board's (SWRCB) Industrial General Permit (IGP)

Measures introduced:

- Inspect nurseries and nursery centers
- Perform follow-up *No Exposure Verification* inspections for at least 25% of industries that have filed a *No Exposure Certification (NEC)*
- Inspect light industrial facilities. Under the SWRCB's IGP adopted in April 1, 2014, light industries previously excluded from coverage under the IGP must now obtain coverage. Light industry is defined as SICs 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 323, 34 (except 3441), 35, 36, 37 (except 373), 38, 39 and 4221-4225. This includes facilities ubiquitous

in industrial zones such as warehouses and machine shops. Although many of these facilities will likely qualify for the NEC, the type and number of facilities requiring inspection under the MS4 Permit will still increase.

These new and enhanced measures will increase the effectiveness of the Industrial/Commercial Facilities Program.

BUSINESS ASSISTANCE PROGRAM AND BMP NOTIFICATION ***MCM-IFC-2***

MS4 Permit: §VI.D.6.c (LB Permit §VII.D.G.3)

Measures introduced:

- Notify industrial/commercial owner/operators of applicable BMP requirements.
- Implement a Business Assistance Program to provide technical information to businesses to facilitate their efforts to reduce the discharge of pollutants in stormwater. The business assistance program described in the prior LA MS4 Permit was an optional provision.

These new and enhanced measures will increase the effectiveness of the Industrial/Commercial Facilities Program.

PRIORITIZE FACILITIES/INSPECTIONS BASED ON WATER QUALITY PRIORITIES ***MCM-IFC-3 (TCM-ICF-1)***

MS4 Permit: Modified MCM (replaces §VI.D.6.d, §VI.D.6.e), LB Permit: (replaces §VII.D.G.4, §VII.D.G.5)

A program has been developed to prioritize industrial/commercial facilities based on their potential to adversely impact WQPs. The resulting prioritization scheme determines the inspection frequency, replacing the uniform inspection frequency provided in the MS4 Permit. This allows Cities to concentrate efforts on WQPs. Sections VI.D.6.d and VI.D.6.e of the MS4 Permit (Sections VII.D.G.4 and VII.D.G.5 of the LB Permit) will be replaced with the language presented in Table 3-3.

TABLE 3-3

REPLACES §VI.D.6.D AND §VI.D.6.E OF THE MS4 PERMIT
REPLACES §VII.D.G.4 AND §VII.D.G.5 OF THE LB PERMIT

MS4 PERMIT VI.D.6.d (LB Permit VII.D.G.4) Prioritize Critical Industrial/Commercial Sources

MS4 Permit VI.D.6.d.i (LB Permit VII.D.G.4.i) Prioritization Method

Prioritizing facilities by potential water quality impact provides an opportunity to optimize the effectiveness of the Industrial/Commercial Facilities Program and to focus efforts on water quality priorities. The inventory fields in Part VI.D.6.b.ii (VII.D.G.2.i) provide information that allows for such a facility prioritization. Based on these fields, Figure ICF-1 establishes a method for each City to prioritize all industrial/commercial facilities into three tiers – High, Medium and Low. A City may follow an alternative prioritization method provided it is based on water quality impact and results in a similar three-tiered scheme.

Prioritization factors

Factor	Description
A	Status of exposure of materials and industrial/commercial activities to stormwater
B	Identification of whether the facility is tributary to a waterbody segment with impairments[2] for pollutants that are also generated by the facility
C	Other factors determined by the City, such as size of facility, presence of exposed soil or history of stormwater violations

Utilizing these factors, follow steps 1, 2 and 3 below:

1. Collect necessary information to evaluate factors

Factor	Initial method	Subsequent method
A	Satellite imagery	Results of stormwater inspection
B	Cross reference Table 4 or Table 5* with tributary TMDL/ 303(d) pollutants	Cross reference inspection results with tributary TMDL/ 303(d) pollutants
C	Varies	

* See pages 9 and 10 of Appendix A-3-1 ICF (guidance for the Industrial/Commercial Facilities Program)

2. Evaluate factors

Factor	Result	Score
A	Low or no exposure	0
	Moderate exposure	½
	Significant exposure	1
B	No*	0
	Yes**	1
C	Low	0
	Medium	½
	High	1

** No pollutant generation/impairment matches
*** ≥ 1 pollutant generation/impairment matches

3. Prioritize facilities

		C Score		
		0	**½**	**1**
A×B Score	**0**	Low	Medium	High
	½	Medium	High	High
	1	High	High	High

This method serves only as a guide to prioritization. The City may also prioritize facilities based on a qualitative assessment of factors A, B and C.

Figure ICF-1: Industrial/Commercial Facility Prioritization Scheme

Step 3 in Figure ICF-1 may also be expressed by the relationships $A \cdot B + C \geq 1 \rightarrow$ High, $1 > A \cdot B + C > 0 \rightarrow$ Medium and $A \cdot B + C = 0 \rightarrow$ Low. The purpose of multiplying A and B is to scale the impact of the presence of the

[2] CWA §303(d) listed or subject to a TMDL

TABLE 3-3

REPLACES §VI.D.6.D AND §VI.D.6.E OF THE MS4 PERMIT
REPLACES §VII.D.G.4 AND §VII.D.G.5 OF THE LB PERMIT

pollutants at a facility (B) by the likelihood that they will be discharged to the MS4 (A). Factor C quantifies water quality concerns that are independent of A or B and as such is incorporated through addition. The purpose of this numerical approach is to provide consistency to the prioritization process. It is intended solely as a guide. The City may also prioritize facilities based on a qualitative assessment of factors A, B and C as listed in Figure ICF-1.

MS4 Permit VI.D.6.d.i.(1), (LB Permit VII.D.G.4.(1)), Prioritization Condition
The following condition will be met during the prioritization process: ***The total number of low priority facilities is less than or equal to 3 times the number of high priority facilities***. This condition is applied to maintain a minimum inspection frequency as explained in Section VI.D.6.e.i.

MS4 Permit VI.D.6.d.i.(2), (LB Permit VII.D.G.4.(2)), Prioritization Frequency
The default priority for a facility is Medium. Facilities will be reprioritized as necessary following the results of routine inspections. The City may also use any readily available information that clarifies potential water quality impacts (e.g., satellite imagery) in order to prioritize a facility before the initial inspection. Reprioritization may also be conducted at any time as new water quality based information on a facility becomes available. During reprioritization, the ratio of low priority to high priority facilities will remain at 3:1 or lower. Figure ICF-2 is a flowchart of the prioritization process.

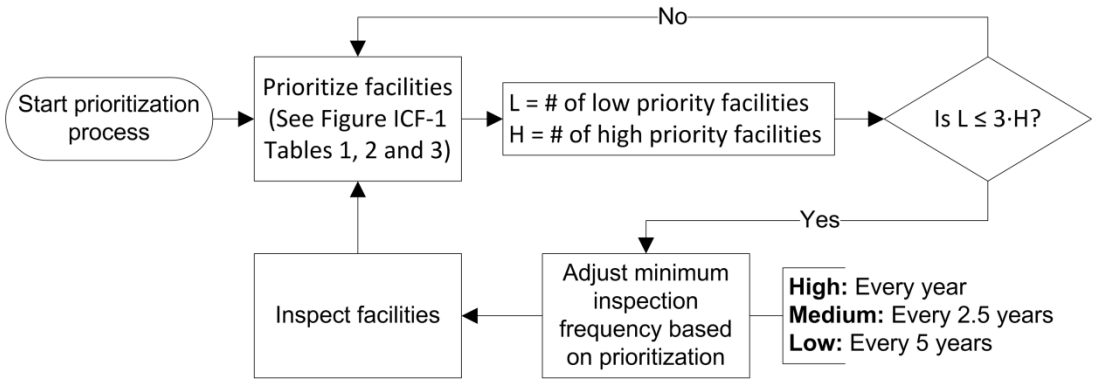


Figure ICF-2

MS4 Permit VI.D.6.e (LB Permit VII.D.G.5) Inspect Critical Industrial/Commercial Sources

MS4 Permit VI.D.6.e.i (LB Permit VII.D.G.5.i) Frequency of Industrial/Commercial Inspections
Following the facility prioritization method in Part VI.D.6.d.i, each City will inspect high priority facilities annually, medium priority facilities semi-quinquennially (once every 2.5 years) and low priority facilities quinquennially (once every five years). The frequencies may be altered by the exclusions defined in Part VI.D.6.e.i.(1). The condition in Part VI.D.6.d.i.(1) ensures at least the same average number of inspections conducted per year as the semi-quinquennial frequency defined in the MS4 Permit.

Each City will conduct the first compliance inspection for all industrial/commercial facilities within one year of the approval of their Watershed Management Program by the Executive Officer. A minimum interval of six months between the first and the second mandatory compliance inspection is required.

MS4 Permit VI.D.6.e.i.(1) (LB Permit VII.D.G.5.i(1)) Exclusions to the Frequency of Industrial Inspections

TABLE 3-3

REPLACES §VI.D.6.D AND §VI.D.6.E OF THE MS4 PERMIT
REPLACES §VII.D.G.4 AND §VII.D.G.5 OF THE LB PERMIT

MS4 Permit VI.D.6.e.i.(1).(a) (LB Permit VII.D.G.5.i(1).(a)) Exclusion of Facilities Previously Inspected by the Regional Water Board

Each City will review the State Water Board's Stormwater Multiple Application and Report Tracking System (SMARTS) database at defined intervals to determine if an industrial facility has recently been inspected by the Regional Water Board. The first interval will occur approximately 2 years after the effective date of the Order. The City does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24 month period. The second interval will occur approximately 4 years after the effective date of the Order. Likewise, the City does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24 month period.

MS4 Permit VI.D.6.e.i.(1).(b) (LB Permit VII.D.G.5.i(1).(b)) No Exposure Verification

As a component of the first mandatory inspection, each City will identify those facilities that have filed a No Exposure Certification with the State Water Board. Approximately 3 to 4 years after the effective date of the Order, each City will evaluate its inventory of industrial facilities and perform a second mandatory compliance inspection at a minimum of 25% of the facilities identified to have filed a No Exposure Certification. The purpose of this inspection is to verify the continuity of the no exposure status.

MS4 Permit VI.D.6.e.ii (LB Permit VII.D.G.5.ii) Scope of Industrial/Commercial Inspections

MS4 Permit VI.D.6.e.ii.(1) (LB Permit VII.D.G.5.ii.(1) Scope of Commercial Inspections

Each City will inspect all commercial facilities to confirm that stormwater and non-stormwater BMPs are being effectively implemented in compliance with municipal ordinances. At each facility, inspectors will verify that the operator is implementing effective source control BMPs for each corresponding activity. Each City will require implementation of additional BMPs where stormwater from the MS4 discharges to a significant ecological area (SEA), a water body subject to TMDL provisions in Part VI.E, or a CWA §303(d) listed impaired water body. Likewise, for those BMPs that are not adequately protective of water quality standards, a City may require additional site-specific controls.

MS4 Permit VI.D.6.e.ii.(2) (LB Permit VII.D.G.5.ii.(2) Scope of Industrial Inspections

Each City will confirm that each industrial facility:

a) Has a current Waste Discharge Identification (WDID) number for coverage under the Industrial General Permit, and that a Stormwater Pollution Prevention Plan (SWPPP) is available on-site; or
b) Has applied for, and has received a current No Exposure Certification for facilities subject to this requirement;
c) Is effectively implementing BMPs in compliance with municipal ordinances. Facilities must implement the source control BMPs identified in Table 10, unless the pollutant generating activity does not occur. The Cities will require implementation of additional BMPs where stormwater from the MS4 discharges to a water body subject to TMDL Provisions in Part VI.E, or a CWA §303(d) listed impaired water body. Likewise, if the specified BMPs are not adequately protective of water quality standards, a City may require additional site-specific controls. For critical sources that discharge to MS4s that discharge to SEAs, each City will require operators to implement additional pollutant-specific controls to reduce pollutants in stormwater runoff that are causing or contributing to exceedances of water quality standards.
d) Applicable industrial facilities identified as not having either a current WDID or No Exposure Certification will be notified that they must obtain coverage under the Industrial General Permit and will be referred to the Regional Water Board per the Progressive Enforcement Policy procedures identified in Part VI.D.2 of the MS4 Permit (Part VII.D.2 of the LB Permit).

ENHANCED PLAN REVIEW PROGRAM ***MCM-DC-1***

MS4 Permit: §VI.D.8.h, §VI.D.8.i (LB Permit: §VII.D.K.x, §VII.D.K.xi)

In general the MS4 Permit introduces provisions that conform to the SWRCB's Construction General Permit. For construction sites one acre or greater, measures include the following:

- Construction activity operators must submit Erosion and Sediment Control Plans (ESCPs) prior to grading permit issuance, developed and certified by a QSD to SWPPP standards.
- Operators must propose minimum BMPs that meet technical standards. The cities must provide these standards.
- Develop procedures and checklists to review and approve relevant construction plans.

These new and enhanced measures will increase the effectiveness of the Development Construction Program, which in turn is expected to reduce TSS loading into the MS4. TSS reduction is an integral component in addressing WQPs.

ENHANCED INSPECTION STANDARDS/BMP REQUIREMENTS AT CONSTRUCTION SITES ***MCM-DC-2***

MS4 Permit: §VI.D.8.d, §VI.D.8.i, §VI.D.8.j (LB Permit: §VII.D.K.vi, §VII.D.K.xi, §VII.D.K.xii)

Measures introduced:

- Ensure BMPs from the ESCPs are properly installed and maintained.
- Ensure the minimum BMPs for sites less than one acre are installed and maintained.
- Develop and implement standard operating procedures for City stormwater inspections of construction sites.
- Require activity-specific BMPs for paving projects.

These new and enhanced measures will increase the effectiveness of the Development Construction Program, which in turn is expected to reduce TSS loading into the MS4. TSS reduction is an integral component in addressing WQPs.

INCREASED INSPECTION FREQUENCIES ***MCM-DC-3***

MS4 Permit: §VI.D.8.j (LB Permit: §VII.D.K.xii)

The inspection frequency for construction sites one acre or more has significantly increased. The prior LA MS4 Permit required a minimum of one inspection during the rainy season. The current MS4 Permit requires monthly inspections year-round, as well as mandatory inspections based on the phase of construction. This enhanced measure will increase the effectiveness of the Development Construction Program, which in turn is expected to reduce TSS loading into the MS4. TSS reduction is an integral component in addressing WQPs.

ENHANCED IC/ID ENFORCEMENT AND WRITTEN PROGRAM PROCEDURES ***MCM-ICID-1***

MS4 Permit: §VI.D.2, §VI.D.10; LB Permit: §VII.D.2 , §VII.D.M

Measures introduced:

- Develop and implement a Progressive Enforcement Policy that applies to the IC/ID Elimination, Development Construction, Planning and Land Development and Industrial/Commercial Facilities Programs. The Progressive Enforcement Policy is an augmentation of the policy listed in the prior LA MS4 Permit, which was restricted to the Industrial/Commercial Facilities Program.
- Maintain written procedures for receiving complaints, conducting investigations and responding to spills.

These new and enhanced measures will increase the effectiveness of the IC/ID Elimination program, as well as the related enforcement components of the Development Construction, Planning and Land Development and Industrial/Commercial Facilities Programs.

STORMWATER RESOURCES ON CITY WEBSITE ***MCM-PIP-1***

MS4 Permit: §VI.D.5.d.i.(4) (LB Permit: §VII.D.F.4.i.(4))

Measures introduced:

- The MS4 Permit introduces a requirement to maintain a stormwater webpage or provide links to stormwater websites via the City's website. The website (in-house or linked) will include:
    - Educational material and
    - Opportunities for the public to participate in stormwater pollution prevention and clean-up activities.

ENHANCED BMP REQUIREMENTS FOR FIXED FACILITY/FIELD ACTIVITIES ***MCM-PAA-1***

MS4 Permit: §VI.D.9.e (LB Permit: §VII.D.L.5)

Measures introduced:

- Implement effective source control BMPs for 65 specific pollutant-generating activities such as mudjacking, shoulder grading and spall repair.
- Contractually require hired contractors to implement and maintain the activity specific BMPs. Conduct oversight of contractor activities to ensure the BMPs are implemented and maintained.

These new and enhanced measures will increase the effectiveness of the Public Agency Activities program.

REPRIORITIZATION OF CATCH BASINS AND CLEAN-OUT FREQUENCIES ***MCM-PAA-2***

MS4 Permit: §VI.D.9.h.iii (LB Permit: §VII.D.L.8.iii)

In areas not subject to a trash TMDL, measures introduced include the following:

- Determine priority areas and update the map of catch basins with GPS coordinates and priority.

- Include the rationale or data to support the priority designations.

These new and enhanced measures will increase the effectiveness of the Public Agency Activities program.

INTEGRATED PEST MANAGEMENT PROGRAM ***MCM-PAA-3***

MS4 Permit: §VI.D.9.g (LB Permit: §VII.D.L.7)

The MS4 Permit introduces entirely new, prescriptive requirements to implement an Integrated Pest Management (IPM) Program for public agency activities and at public facilities. These requirements include adopting and verifiably implementing policies, procedures and/or ordinances that support the IPM program. Intertwined with the IPM provisions are additional requirements to control and minimize the use of fertilizers. These new and expansive measures will increase the effectiveness of the Public Agency Activities program and address WQPs.

ENHANCED MEASURES TO CONTROL INFILTRATION FROM SANITARY SEWERS ***MCM-PAA-4***

MS4 Permit: §VI.D.9.ix (LB Permit: §VII.D.L.ix)

The MS4 Permit introduces specific requirements to control infiltration from the sanitary sewer into the MS4. The measures include adequate plan checking, preventative maintenance, spill response, enforcement, interagency coordination and staff/contractor education. The requirements may be fulfilled through implementation of a Sewer System Management Plan in accordance with the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems.

INSPECTION AND MAINTENANCE OF PERMITTEE OWNED TREATMENT CONTROLS ***MCM-PAA-5***

MS4 Permit: §VI.D.9.x (LB Permit: §VII.D.L.x)

The MS4 Permit introduces requirements to implement an inspection and maintenance program for all Permittee owned treatment control BMPs, including post-construction treatment control BMPs. This measure will increase the effectiveness of the Public Agency Activities program.

3.3 NON-STORMWATER DISCHARGE MEASURES

The Participating Agencies will require dischargers that drain to their respective MS4s to implement the Non-stormwater Discharge (NSWD) Measures as defined in §III.A of the MS4 Permit (§IV.B of the LB Permit). If the Participating Agencies identify non-stormwater discharges from the MS4 as a source of pollutants that cause or contribute to exceedances of receiving water limitations, the WCMs will be modified and implemented – subject to the adaptive management process – to effectively eliminate the source of pollutants consistent with MS4 Permit §III.A and §VI.D.10 (LB Permit §IV.B and §VII.D.M). In these instances, potential WCMs may include prohibiting the non-stormwater discharge to the MS4, requiring the responsible party to 1) incorporate additional BMPs to reduce pollutants in the non-stormwater discharge or conveyed by the non-stormwater discharge or 2) divert to a sanitary sewer for treatment, or strategies to require the non-stormwater discharge to be separately regulated under a general NPDES permit.

It is important to note that the non-stormwater Outfall Based Screening and Monitoring Program (MRP §IX) introduces additional NSWD measures through the intensive procedures required for the identification of NSWDs from MS4 outfalls.

3.3.1 NEW FOURTH TERM PERMIT NON-STORMWATER DISCHARGE MEASURES

Parts III.A and VI.B (MRP IX) of the MS4 Permit (Parts IV.B and VII.B (MRP IX) of the Long Beach Permit introduce new provisions and program elements that address NSWDs. This section briefly describes these new and enhanced NSWD measures. A NSWD measure is considered new if it was not required by the prior MS4 Permit and is considered enhanced if it is an enhancement of a related provision of the prior MS4 Permit.

Table 3-2 from the previous section lists the new and enhanced nonstructural NSWD measures as well as the City MCMs. The BMP effectiveness from Table 3-2 is based on similar BMPs listed in Tetra Tech's CLRP for Chollas Creek Watershed in San Diego County, 2012. The correlation of BMP effectiveness with WQPs is based on Table 3-1. The following pages describe each of the listed controls. The details of each provision may be found in the relevant sections of the MS4 Permit, which are included. Unless an alternate date is provided in the MS4 Permit or in this section, the adoption date for the NSWD measures coincides with the approval of the WMP by the Regional Board's Executive Officer.

NSWD-1 OUTFALL SCREENING AND SOURCE INVESTIGATIONS ***NSWD-1***

MS4 Permit: §VI.B (MRP §IX) (LB Permit: MRP §IX)

The outfall screening and source investigation provisions of the MS4 Permit constitute an entirely new, expansive addition to each City's JSWMP. Implementing these new provisions will significantly support the control of unauthorized non-stormwater discharges.

ENHANCED CONDITIONS FOR EXEMPT NON-STORMWATER DISCHARGES ***NSWD-2***

MS4 Permit: §III.A (LB Permit: §IV.B)

The NSWD prohibitions of the MS4 Permit, which include specific measures to reduce irrigation runoff, are a significant enhancement from the prior LA MS4 Permit. Measures introduced include the following:

- Require the implementation of BMPs following established BMP manuals for discharges from non-emergency fire fighting activities and drinking water supplier distribution systems. Require specific BMPs for lake dewatering, landscape irrigation, pool and fountain discharges and non-commercial car washing.
- Require notification, monitoring (i.e. sampling) and reporting for drinking water supplier discharges and lake dewatering greater than 100,000 gallons.
- Require advance notification for any discharge of 100,000 gallons or more into the MS4.
- Minimize discharge of landscape irrigation through implementation of an ordinance specifying water efficient landscaping standards.
- Promote water conservation programs to minimize the discharge of landscape irrigation water into the MS4. This includes the following, where applicable:
    - Coordinate with local water purveyor(s) to promote:
        - Landscape water efficiency requirements for existing landscaping,
        - Drought tolerant, native vegetation, and
        - Less toxic options for pest control and landscape management.
    - Develop and implement a coordinated outreach and education program to minimize the discharge of irrigation water and pollutants associated with irrigation water.
- If monitoring results indicate that a conditionally exempt NSWD is a source of pollutants that causes or contributes to exceedances of applicable receiving water limitations and/or water quality-based effluent limitations, the Permittee must either:
    - Effectively prohibit the non-stormwater discharge to the MS4, or
    - Impose additional conditions, subject to approval by the Regional Water Board Executive Officer, or
    - Require diversion of the NSWD to the sanitary sewer, or
    - Require treatment of the NSWD prior to discharge to the receiving water.

Implementing these enhanced provisions will significantly support the control of unauthorized non-stormwater discharges.

3.4 TARGETED CONTROL MEASURES

Targeted Control Measures (TCMs) are additional control measures beyond the baseline MCMs and NSWD measures of the MS4 Permit that are intended to target the Watershed Group's WQPs. TCMs may be divided into two categories: nonstructural and structural. The selection of structural and nonstructural control measures to address WQPs within the Watershed Group is a vital component of the WMP planning process.

The Participating Agencies have already proposed and implemented a number of structural and nonstructural control measures in the watershed that collectively may contribute to considerable pollutant load reductions. These existing and planned BMPs provide a head start in the planning process to address WQPs within the Watershed Group. There are many different types of structural and nonstructural control measures that provide varying benefits from their implementation. The following sections describe Planned TCMs to be implemented, Potential TCMs that may be implemented (implementation is conditional upon factors such as site constraints, governing body approval, etc.) as well types of structural BMPs available to the Watershed Group.

3.4.1 NONSTRUCTURAL TARGETED CONTROL MEASURES

3.4.1.1 CONTROL MEASURES IDENTIFIED IN TMDLS/IMPLEMENTATION PLANS

There are no control measures identified in the San Gabriel River Metals TMDL. Planned and potential control measures to address the Metals TMDL are incorporated within the WCMs identified in this Chapter.

As recognized by the footnote in Attachment K of the Permit, the Participating Agencies have entered into an Amended Consent Decree with the United States and the State of California, including the Regional Board. The footnote specifically states: "The requirements of this Order to implement the obligations of [the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL] do not apply to a Permittee to the extent that it is determined that the Permittee has been released from that obligation pursuant to the Amended Consent Decree entered in *United States v. Montrose Chemical Corp.*, Case No. 90-3122 AAH (JRx)." The submission of this WMP and its associated CIMP and any action or implementation taken pursuant to it shall not constitute a waiver of any such release of obligations established by that Amended Consent Decree.

3.4.1.2 TOTAL SUSPENDED SOLIDS REDUCTION

As explained in the introduction to this chapter, emphasis is placed on source control as a cost-effective measure to reduce pollutant loads. In this WMP, the chief approach is controlling Total Suspended Solids (TSS) at the source, as explained in the following section. Combining this approach with true source control, low impact development, green streets, and the MCMs constitutes a strong and effective initial implementation of the WMP, providing time for funding measures to be put in place to pay for the design, construction, and operation of stormwater capture and low flow diversion facilities and to develop working relationships with water and wastewater agencies.

BACKGROUND

TSS is the governing pollutant for metals. This is consistent with that found within the USEPA approved San Gabriel River Metals TMDL which represents metals (copper, lead, and zinc) through their associations with sediment. Reducing TSS in the receiving waters is anticipated to result in a significant reduction of metals in the receiving waters since both pollutant groups adhere to sediment; therefore initial implementation will focus on TSS reduction. Initial emphasis on TSS reduction should reduce the volume of water that ultimately needs to be captured and infiltrated or used to achieve standards for the Category 1 pollutants being addressed by the WMP – namely metals. This would make implementation of the WMP more cost-efficient.

Documentation is not available for the LSGR watershed; however it is available for the adjacent Los Cerritos Channel (LCC) Watershed, of which many LSGR cities drain to in part. For that watershed, Table 3-4 below provides a summary of TSS concentrations at the Stearns Street monitoring site over a 13-year period based on 74 wet-weather observations and 25 dry-weather observations.

Table 3-4: TSS statistics measured at LCC TMDL Monitoring Site

Statistic	Wet Weather (mg/L)	Dry Weather (mg/L)
No. of observations	74	25
Minimum	17	2
Maximum	1700	128
1st Quartile	96	7.5
Median	155	13
3rd Quartile	260	41
Mean	227	27
Standard deviation (n-1)	256	30

Although the RAA is only assuming a 5% pollutant load reduction through implementation of the TSS Reduction Strategy, the Watershed Group is targeting greater reductions. In an analysis performed by the Los Cerritos Channel WMP Group, it was determined that the expected reduction in the mean concentration of TSS at Stearns Street from 227 mg/l to 150 mg/l, which would be a 34% reduction in the mean concentration of TSS. The reduced value is consistent with those found in other watersheds with similar land uses. A quantification of the program's potential effectiveness is included in Section 4.3.1.

TSS REDUCTION STRATEGY

The core of the TSS Reduction Strategy is the Group's soil stabilization/sediment control. Two key components of this strategy are implementation of enhanced erosion and sediment control at construction sites, in accordance with each city's Development Construction Program, and stabilization of exposed soil not associated with construction sites. Initial assessments conducted by the LCC Watershed Group have indicated that vacant lots, Caltrans rights-of-way and transmission line rights-of-way are the primary areas of exposed soil not associated with construction sites. Specific control measures for these areas are explained in the following section.

3.4.1.3 LIST OF NONSTRUCTURAL TCMS

Table 3-5 lists planned and potential nonstructural TCMs for each participating agency. The BMP effectiveness from Table 3-2 is based on similar BMPs listed in Tetra Tech's CLRP for Chollas Creek Watershed in San Diego County, 2012. The correlation of BMP effectiveness with WQPs is based on Table 3-1. The pages following Table 3-5 describe each of the listed controls.

The responses for each agency under Table 3-5 are defined as follows:

- ✗ *Planned TCM*. Under the presumption that 1) the TCM will likely not require approval of the governing body and 2) the governing body approves adequate staff/budget (if necessary), the TCM will be implemented.

- **P** *Potential TCM*. The TCM is under consideration by the agency, however implementation is contingent upon yet to be determined factors. These factors include approval by the governing body, additional time needed to inform the governing body and/or relevant staff and approval of service contracts. As such implementation cannot be assured at this time. If the Potential TCM is not adopted by the agency within the first two years of the implementation of the WMP, it will be reconsidered through the adaptive management process.

- **C** *Completed TCM*. The TCM is preexisting (has been in effect for several years or more) or has recently been completed.

- AM_o *Adaptively Managed Out TCM*. The TCM potentially implemented by the agency at the time of the development of the WMP is now being adaptively managed out of the WMP.

It is important to note that Caltrans and the LACFCD are operating regional stormwater programs and consequently incorporating localized institutional TCMs may not be feasible. As such their exclusion from such TCMs is justified.

The schedule of implementation for the TCMs is provided in Chapter 5.

Table 3-5 Nonstructural TCMs

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency														
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Artesia	Bellflower	Cerritos	Diamond Bar	Downey	LACFCD	Hawaiian Gardens	Lakewood	La Mirada	Long Beach	Norwalk	Pico Rivera	Santa Fe Springs	Whittier
		Planning and Land Development																				
1	TCM-PLD-1	Train staff/councils to facilitate LID and Green Streets implementation	◈	◈	◈	◈	◈	✗	C	✗	C	C	N/A	C	C	C	C	C	C	C	C
2	TCM-PLD-2	Ordinance requiring LID BMPs for projects below MS4 Permit thresholds	◈	◆	◈	◆	◆					C	N/A				C				P
		Existing Development																				
3	TCM-ICF-1 (MCM-ICF-3)	Prioritize facilities/inspections based on water quality priorities	◈	◈	◈	◈	◈	C		C	C	C	N/A	C	C	C	C	C	✗	C	C
4	TCM-TSS-1	Exposed soil ordinance	◈	◆	◈	◆	◇		P			C	N/A				P	P	P		C
5	TCM-TSS-2	Erosion repair and slope stabilization on private property	◈	◆	◈	◆	◇		P				N/A				P	P	P		C
6	TCM-TSS-3	Private parking lot sweeping ordinance	◆	◆	◈	◆	◇					C	N/A				P				C
7	TCM-TSS-4	Sweeping of private roads and parking lots	◆	◆	◈	◆	◇					✗	N/A				P				P
8	TCM-TSS-5	Negotiations with regulated utilities for erosion control within R.O.W.	◈	◆	◈	◆	◇						**Watershed Group**								

Table 3-5 Nonstructural TCMs

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency														
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Artesia	Bellflower	Cerritos	Diamond Bar	Downey	LACFCD	Hawaiian Gardens	Lakewood	La Mirada	Long Beach	Norwalk	Pico Rivera	Santa Fe Springs	Whittier
9	TCM-RET-1	Encourage retrofitting of downspouts (downspout disconnect)	◈	◈	◈	◈	◆					C	N/A				C		C		P
		Dry weather runoff reduction																				
10	TCM-NSWD-1	Incentives for irrigation reduction practices	◈	◆	◈	◆	◆	C	C	C	C	C	N/A	C	C	C	C	C	C	C	C
		Public Information and Participation																				
11	TCM-PIP-1	Refocused outreach to target audiences and water quality priorities	◆	◆	◆	◆	◆	**Watershed Group**														
		Public Agency Activities																				
12	TCM-PAA-1	Upgraded sweeping equipment (e.g. regenerative)	◆	◆	◈	◆	◇	C	C	C	C	C	N/A	C	C	C	C	C	C	C	C
13	TCM-PAA-2	Adopt Sewer System Management Plan (SSMP)	◇	◆	◇	◇	◇	C	C	C	C	C	N/A	C	C	C	C	C	C	C	C
14	TCM-PAA-3	Adopt (nonstructural) statewide trash amendments	◈	◈	◈	◇	◇	✗	✗	✗	✗	✗	N/A	✗	✗	✗	✗	✗	✗	✗	✗
15	TCM-PAA-4	Increased street sweeping frequency or routes	◆	◆	◈	◆	◇		P			P	N/A					AM_O			P

Table 3-5 Nonstructural TCMs

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency														
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Artesia	Bellflower	Cerritos	Diamond Bar	Downey	LACFCD	Hawaiian Gardens	Lakewood	La Mirada	Long Beach	Norwalk	Pico Rivera	Santa Fe Springs	Whittier
16	TCM-TSS-6	Erosion repair and slope stabilization on public property and right of way	◈	◆	◈	◆	◇					C	N/A				X				✗
		Reporting/Adaptive Management																				
17	TCM-MRP-1	Enhanced tracking through use of online GIS MS4 Permit database	◈	◈	◈	◈	◈		C	✗	P	C		✗	C		C	✗	P	C	✗
		Jurisdictional SW Management																				
18	TCM-SWM-1	Prepare guidance documents to aid in implementation of MS4 Permit MCMs	◈	◈	◈	◈	◈	C	C	C	C	C	C	C	C	C	C	C	C	C	C
		Initiatives																				
19	TCM-INI-1	Copper reduction through implementation of SB 346	◆	◆	◇	◇	◇	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
20	TCM-INI-2	Lead reduction through implementation of SB 757	◆	◆	◇	◇	◇	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
21	TCM-INI-3	Support zinc reduction in tires through safer consumer product regulations	◆	◆	◇	◇	◇	**Watershed Group**													
22	TCM-INI-4	Apply for grant funding for stormwater quality/capture projects	◈	◆	◈	◆	◆		C			C	✗				C	C	C	C	C

✗ – Planned TCM. **P** – Potential TCM. **C** – Completed/implemented TCM. **AM$_O$** – Adaptively Managed Out TCM. ◆ Primary pollutant reduction ◈ Secondary pollutant reduction ◇ Pollutant not addressed

BMP effectiveness ratings based on similar BMPs listed in Tetra Tech's CLRP for Chollas Creek Watershed in San Diego County, 2012.

ENHANCED TRACKING THROUGH USE OF ONLINE GIS MS4 PERMIT DATABASE ***TCM-MRP-1***

Measures:

- Enter the enhanced tracking requirements of the fourth term MS4 Permit on an online GIS database management system dedicated to Phase I MS4 Permit compliance. Program elements addressed include all the MCMs (Development Construction, Planning and Land Development, Industrial/Commercial Facilities, Public Agency Activities, Public Information and Participation and Illicit Connection/Discharge Elimination) and the Monitoring and Reporting Program.
- Use the consolidated tracking data to:
    - Improve the effectiveness of the JSWMP (e.g. examine geospatial trends in IC/IDs, which could be used to strategically distribute public education materials) and WMP.
    - Assess the JSWMP and improve the annual reporting process.
    - Guide the adaptive management process through this assessment.

Many of the cities are implementing the measures through the use of *MS4Front*, a propriety online GIS MS4 Permit database management system.

TRAIN STAFF TO FACILITATE LID AND GREEN STREETS IMPLEMENTATION ***TCM-PLD-1***

Measures:

- Conduct training for relevant staff in LID and Green Streets implementation prior to the onset of the programs. The elements of the training follow the provisions listed in MS4 Permit §VI.D.7.
- Educate governing bodies in LID and Green Streets implementation (optional).

Many of the cities are implementing these measures, which facilitate LID implementation and address WQPs.

ORDINANCE REQUIRES LID BMPS FOR PROJECTS BELOW MS4 PERMIT THRESHOLDS ***TCM-PLD-2***

Measures:

- Adopt an ordinance requiring LID BMPs for smaller development projects that are below the thresholds for inclusion under the Planning and Land Development MCM Program.

The City of Downey and Long Beach have accomplished this measure, which facilitates LID and addresses WQPs.

PRIORITIZE FACILITIES/INSPECTIONS BASED ON WATER QUALITY PRIORITIES ***TCM-ICF-1 (MCM-ICF-3)***

MS4 Permit: Modified MCM (replaces §VI.D.6.d, §VI.D.6.e)

A program has been developed to prioritize industrial/commercial facilities based on their potential to adversely impact WQPs. The resulting prioritization scheme determines the inspection frequency,

replacing the uniform inspection frequency provided in the MS4 Permit. This allows Cities to concentrate efforts on WQPs.

The complete program is detailed in the Minimum Control Measures section of this chapter – see MCM-ICF-3.

EXPOSED SOIL ORDINANCE

TCM-TSS-1

This TCM is an element of the TSS Reduction Strategy.

- Adopt ordinances that require landscaping, erosion control, and sediment control on vacant lots and other significant sources of exposed dirt.
- These efforts are distinct from construction activity control measures, which are addressed under the Development Construction MCM program.

The City of Downey has ordinance language that satisfies this control measure. The City of Whittier also adopted and implemented such an ordinance. The City of Whittier's ordinance requires drought tolerant landscaping/xeriscaping. The ordinance language may be used as a template to develop similar ordinances for the other participating agencies, and as such is included in Appendix A-3-3.

EROSION REPAIR AND SLOPE STABILIZATION ON PRIVATE PROPERTY

TCM-TSS-2

This TCM is an element of the TSS Reduction Strategy. Measures include:

- If adopted, enforce the ordinances from TCM-TSS-1.
- Proactively enforce the existing stormwater ordinance regarding TSS-laden stormwater discharges (or potential discharges) from significant sources of exposed dirt and follow the Progressive Enforcement Policy. This may include observing site conditions prior to rain events and visual monitoring of stormwater discharges.

The City of Whittier has implemented an ordinance in conformance with TCM-TSS-1. Pictures of some of the landscaped lots are included.

Wardman St and Philadelphia St, NW corner (1)


Wardman St and Philadelphia St, NW corner (2)

Greenleaf Ave and Philadelphia St, east side

Bailey St and Comstock Ave, NW corner

PRIVATE PARKING LOT SWEEPING ORDINANCE ***TCM-TSS-3***

This TCM is an element of the TSS Reduction Strategy.

- Adopt an ordinance that requires sweeping of private parking lots. An example ordinance from the City of Signal Hill is included in Appendix A-3-3.

The City of Downey and Whittier have adopted such ordinances that specify how often a parking lot needs to be swept based on the number of motor vehicle parking spaces available.

SWEEPING OF PRIVATE ROADS AND PARKING LOTS ***TCM-TSS-4***

This TCM is an element of the TSS Reduction Strategy.

- If adopted, enforce the ordinance from TCM-TSS-3.
- Proactively enforce the existing stormwater ordinance regarding TSS-laden stormwater discharges (or potential discharges) for private roads and parking lots and follow the Progressive Enforcement Policy. This may include observing site conditions prior to rain events and visual monitoring of stormwater discharges.

NEGOTIATIONS WITH REGULATED UTILITIES FOR EROSION CONTROL WITHIN R.O.W. ***TCM-TSS-5***

This TCM is an element of the TSS Reduction Strategy.

- As a Watershed Group, pursue agreements between cities and utilities regarding erosion and sediment control in rights-of-way.

Since Caltrans is a participant in the Watershed Group, the cities will work with Caltrans to ensure that its rights-of-way are stabilized in a timely manner. However, since the public and private utilities whose rights-of-way must be stabilized are not members of the Watershed Group, negotiations with the utilities on how best to keep sediment from their rights-of-way out of the storm drain system will be necessary.

EROSION REPAIR AND SLOPE STABILIZATION ON PUBLIC PROPERTY ***TCM-TSS-6***

This TCM is an element of the TSS Reduction Strategy.

- Implement landscaping, erosion control, and sediment control on significant sources of exposed dirt on public property.

ENCOURAGE RETROFITTING OF DOWNSPOUTS (DOWNSPOUT DISCONNECT) ***TCM-RET-1***

Measures:

- Encourage owners/operators of existing developments to disconnect existing downspouts from the MS4.

INCENTIVES FOR IRRIGATION REDUCTION PRACTICES ***TCM-NSWD-1***

Measures:

- Provide incentives such as rebates for irrigation reduction (i.e. runoff reduction) practices such as xeriscaping and turf conversion.

All cities are currently involved in this effort through the Metropolitan Water District's water conservation rebate program.

- Incentive programs include:
    - Metropolitan Water District of Southern California's "On-site Retrofit Pilot Program Incentives for Recycled Water Use". This program provides financial incentives to public or private owners to convert potable water irrigation or industrial water systems to recycled water service.
    - Metropolitan Water District of Southern California's "Water Savings Incentive Program". This program provides financial incentives for commercial, industrial, institutional, agricultural or large landscape customers to customize was efficiency projects that include installation of high-efficiency equipment, process improvements, water efficiency improvements, and water management services
    - Metropolitan Water District's "Turf Rebate Program." The program offers at least $2.00 per square foot of turf removed or replace by California-friendly drought-resistant plants.
    - Metropolitan Water District's "Rain Barrel" rebate program. This program offers at least $75 per barrel installed on location. The purpose is to collect rainwater from gutters and downspouts for lawn and garden irrigation purposes.
    - Metropolitan Water District's "Soil Moisture Sensor System." This program offers a rebate for installation of a Soil Moisture Sensor System or a Weather Based Irrigation Controller.
    - Metropolitan Water District's "Rotating Nozzles" program. This program offers rebates to both residential and commercial entities to switch to high-efficiency nozzles.

There are two cities in this Watershed Management Group that have incentive programs beyond the programs offered by Metropolitan Water District. The following City programs are supplemental to MWD rebate programs:

- **Lakewood** has rebate programs for turf removal and water-wise re-landscaping and for installing water-wise irrigation devices (while funds last).
  http://www.lakewoodcity.org/services/request/water/rebates.asp

- **Long Beach** has the "Lawn-to-Garden" program, which provides financial incentives (while funds last) for converting water-thirsty lawns to water-smart lawns.
  http://www.lblawntogarden.com/.

  In addition, the Synthetic Turf Pilot Program that offers an incentive for removing grass lawns and replacing them with synthetic turf (while fund last).
  http://www.lbwater.org/sites/default/files/file_attach/pdf/STPP%20Flyer%20FINAL_online.pdf

REFOCUSED OUTREACH TO TARGET AUDIENCES AND WATER QUALITY PRIORITIES ***TCM-PIP-1***

Measures:

- Within the Public Information and Education Program, elements such as material use/development and advertisements will address WQPs. The development of this effort will be ongoing throughout the MS4 Permit term, and may be regarded as a Watershed Group effort.

UPGRADED SWEEPING EQUIPMENT (E.G. REGENERATIVE) ***TCM-PAA-1***

Measures:

- Upgrade street sweeping equipment to regenerative or other high-efficiency new technology.

Most of the Cities contract street sweeping to private companies. These companies have already phased in regenerative sweepers. The City of Whittier has been phasing in regenerative sweepers and expects to be 100% regenerative by the end of the MS4 Permit term. The City of Long Beach operates vacuum sweepers over regenerative due to maintenance concerns. However, the City is utilizing regenerative sweepers wherever possible.

ADOPT SEWER SYSTEM MANAGEMENT PLAN MEASURES: ***TCM-PAA-2***

All agencies are enrolled in the statewide Waste Discharge Requirements for Sanitary Sewer Systems, which required the development and implementation of a Sewer System Management Plan (SSMP in mid 2009. The goal of the SSMP is to reduce and prevent sanitary sewer overflows (SSOs), as well as mitigate any SSOs that do occur. This goal also addresses WQPs. Elements of the SSMP include:

- Sanitary sewer system operation and maintenance program
- Design and performance provisions
- Overflow emergency response plan
- FOG Control Program
- System Evaluation and Capacity Assurance Plan

Following these SSMP elements will address WQPs.

ADOPT (NONSTRUCTURAL) STATEWIDE TRASH AMENDMENTS ***TCM-PAA-3***

Measures:

- Any mandatory nonstructural control measures required by the statewide Trash Amendments (approved and in effect) will result in trash load reductions. Since pollutants such as organics can adhere to plastic trash, secondary reductions for non-trash pollutants may be expected.

INCREASED STREET SWEEPING FREQUENCY OR ROUTES ***TCM-PAA-4***

Measures:

- Increase the street sweeping frequency, jurisdiction-wide or in high trash-generating areas and/or include additional routes (e.g. center medians and intersections).

PREPARE GUIDANCE DOCUMENTS TO AID IMPLEMENTATION OF MS4 PERMIT MCMS ***TCM-SWM-1***

This WMP includes in Appendix A-3-1 guidance documents and template forms to aid the Agencies in implementation of the MS4 Permit MCMs. These documents were developed to address two issues: 1) the MS4 Permit introduces many new and enhanced MCM provisions that do not have preexisting guidance documentation and 2) the model Stormwater Quality Management Program (SQMP) – which was required in the prior LA MS4 Permit and served as a guide to permit implementation – is now obsolete. Unlike the SQMP, the Agencies are not bound to the guidance and forms provided. They are provided as a resource to improve the effectiveness of the JSWMPs.

COPPER REDUCTION THROUGH IMPLEMENTATION OF SB 346 ***TCM-INI-1***

This initiative TCM has been completed recently. The impact of the TCM over time has been incorporated into the RAA.

LEAD REDUCTION THROUGH IMPLEMENTATION OF SB 757 ***TCM-INI-2***

This initiative TCM has been completed recently.

SUPPORT ZINC REDUCTION IN TIRES THROUGH SAFER CONSUMER PRODUCT REGULATIONS ***TCM-INI-3***

Measures:

- As a Watershed Group, plan to work with others to use the Department of Toxic Substances Control's Safer Consumer Product Regulations to reduce the zinc in tires, which one of the greatest sources of zinc in urban areas.

APPLY FOR GRANT FUNDING FOR STORMWATER CAPTURE PROJECTS ***TCM-INI-4***

Measures:

- Initiate Individual or multi-jurisdictional efforts to apply for grant funding for stormwater quality/capture projects.

Watershed Group members and individual jurisdictions have and will apply for grants when appropriate. In April 2014, the Gateway Water Management Authority received grant funding of $1.3 million for LID projects in the Cities of Downey, Norwalk, Pico Rivera, Santa Fe Springs and Whittier (as well as Lynwood, Paramount, Signal Hill and South Gate). The City of Bellflower recently received grant funding of $13 million for various stormwater treatment and capture BMPs at Caruthers Park as part of the LSGR Regional Treatment Corridor Plan. The City of Downey also received grant funding of $1.6 million for improvements at Wilderness Park as part of the LSGR Regional Treatment Corridor Plan.

3.4.2 STRUCTURAL TARGETED CONTROL MEASURES

Structural TCMs are Structural BMPs, in addition to MCMs, designed with the objective to achieve interim and final water quality-based effluent limitations and/or receiving water limitations. Structural TCMs are an important component of the Watershed Group's load reduction strategy. These BMPs are constructed to capture runoff and filter, infiltrate, or treat it. If properly maintained, these BMPs can have high pollutant removal efficiencies (see the *Performance Evaluation of Structural BMPs* element of this section); however, they tend to be more expensive than nonstructural BMPs. The two prevailing approaches for implementing Structural BMPs are regional and distributed approaches. Both serve important purposes and should be considered in combination to determine the best possible implementation strategy to meet the Watershed Group's water quality goals.

DISTRIBUTED BMPS

Distributed Structural BMPs are generally built at the site-scale. They are intended to treat stormwater runoff at the source and usually capture runoff from a single parcel or site.

Figure 3-1: Distributed BMP Schematic

REGIONAL BMPS

Regional BMPs refer to large structural BMPs that receive flows from neighborhoods or large areas and may serve dual purposes for flood control or groundwater recharge[3].

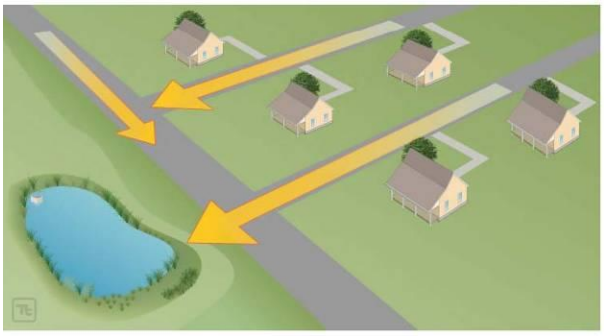


Figure 3-2: Regional BMP Schematic

[3] San Diego River Watershed Comprehensive Load Reduction Plan (2012)

3.4.2.1 STRUCTURAL BMP SUBCATEGORIES

Structural BMPs fall under a variety of subcategories that correspond to their function and water quality benefit. Some of the most common of these subcategories are described below. These subcategories will be used throughout the WMP to describe existing, planned, and potential regional and distributed BMPs.

INFILTRATION BMPS

Infiltration BMPs allow for stormwater to percolate through the native soils and recharge the underlying groundwater table, subsequently decreasing the volume of water discharged to the downstream waterbodies. These BMPs must be constructed in areas where the native soils have percolation rates and groundwater levels sufficient for infiltration.

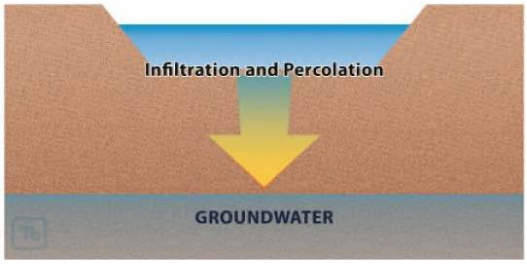


Figure 3-3: Infiltration BMP Schematic

INFILTRATION BASIN

An infiltration basin consists of an earthen basin with a flat bottom. An infiltration basin retains stormwater runoff in the basin and allows the retained runoff to percolate into the underlying soils. The bottom of an infiltration basin is typically vegetated with dryland grasses or irrigated turf grass.

INFILTRATION TRENCH

An infiltration trench is a long, narrow, rock-filled trench with no outlet other than for overflow. Runoff is stored in the void space between stones and infiltrates through the bottom and sides of the trench. Infiltration trenches provide the majority of their pollutant removal benefits through volume reduction. Pretreatment is important for limiting amounts of coarse sediment entering the trench which can clog and render the trench ineffective.

BIORETENTION WITH NO UNDERDRAIN

Bioretention facilities with no underdrain are landscaped shallow depressions that capture and infiltrate stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, engineered media, and vegetation. As stormwater passes down through the media, pollutants are filtered, adsorbed, and biodegraded by the soil and vegetation.

Figure 3-4: Bioretention without underdrain schematic

DRYWELL

Drywells are similar to infiltration trenches in their design and function; however, drywells generally have a greater depth to footprint area ratio and can be installed at relatively deep depths. A drywell is a subsurface storage facility designed to temporarily store and infiltrate runoff. A drywell may be either a small excavated pit filled with aggregate or a prefabricated storage chamber or pipe segment.

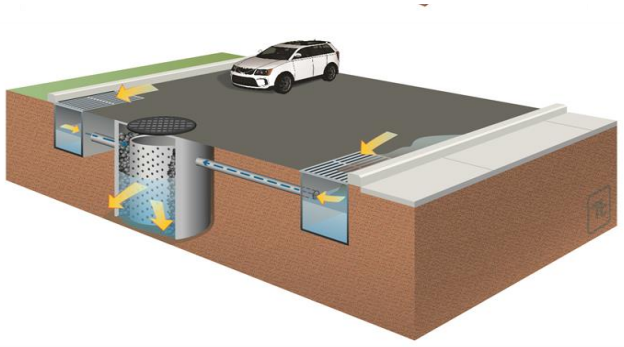


Figure 3-5: Drywell schematic

POROUS PAVEMENT

Porous pavement (concrete, asphalt, and pavers) contain small voids that allow water to pass through to a gravel base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or poured in place pavement (porous concrete, permeable asphalt). Porous pavements treat stormwater and remove sediments and metals within the pavement pore space and gravel base. While conventional pavement results in increased rates and volumes of surface runoff, properly constructed and maintained porous pavements allow stormwater to percolate through the pavement and enter the soil below. This facilitates groundwater recharge while providing the structural and functional features needed for the roadway, parking lot, or sidewalk. The paving surface, subgrade, and installation requirements of porous pavements are more complex than those for conventional asphalt or concrete surfaces.

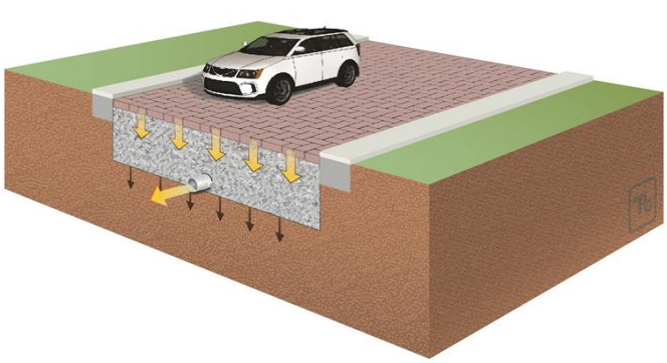


Figure 3-6: Porous pavement schematic

BIOTREATMENT BMPS

Biotreatment BMPs treat stormwater through a variety of physical, chemical, and biological processes prior to being discharged to the MS4 system. These BMPs should be considered where Infiltration BMPs are infeasible.

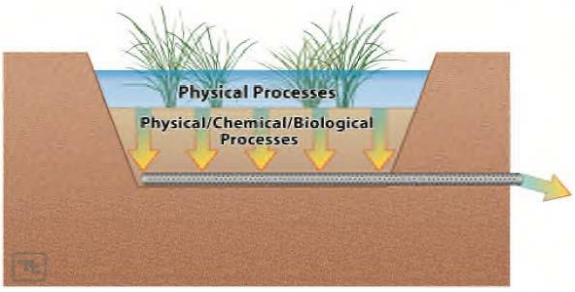


Figure 3-7: Biotreatment BMP schematic

BIORETENTION WITH UNDERDRAINS

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, engineered media, and vegetation. As stormwater passes down through the media, pollutants are filtered, adsorbed, biodegraded, and sequestered by the soil and vegetation. Bioretention with underdrain systems are utilized for areas containing native soils with low permeability or steep slopes, where the underdrain system routes the treated runoff to the storm drain system.

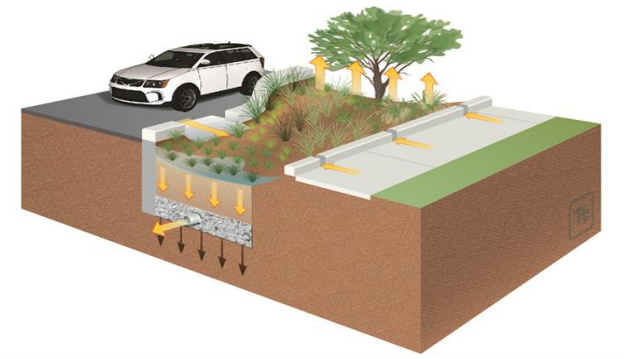


Figure 3-8: Bioretention with Underdrains schematic

VEGETATED SWALES

Vegetated swales are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels. In addition, although it is not their primary purpose, vegetated swales also provide the opportunity for volume reduction through subsequent infiltration and evapotranspiration and reduce the flow velocity. Where soil conditions allow, volume reduction in vegetated swales can be enhanced by adding a gravel drainage layer underneath the swale allowing additional flows to be retained and infiltrated. Where slopes are shallow and soil conditions limit or prohibit infiltration, an underdrain system or low flow channel for dry weather flows may be required to minimize ponding and convey treated and/or dry weather flows to an acceptable discharge point. An effective vegetated swale achieves uniform sheet flow through a densely vegetated area for a period of several minutes (depending on design standard used).

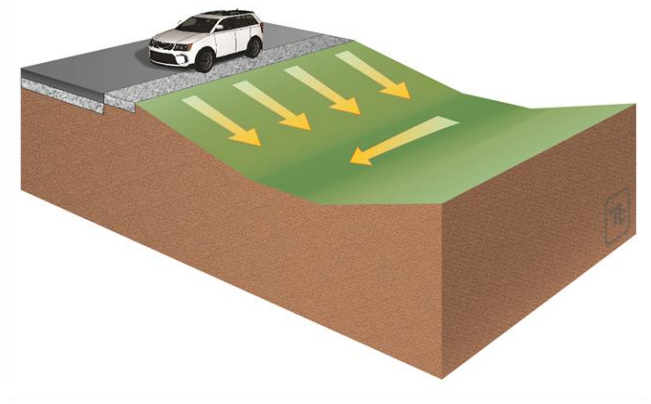


Figure 3-9: Vegetated swale schematic

WET DETENTION BASIN

Wet detention basins are constructed, naturalistic ponds with a permanent or seasonal pool of water (also called a “wet pool” or “dead storage”). Aquascape facilities, such as artificial lakes, are a special

form of wet pool facility that can incorporate innovative design elements to allow them to function as a stormwater treatment facility in addition to an aesthetic water feature. Wet ponds require base flows to exceed or match losses through evaporation and/or infiltration, and they must be designed with the outlet positioned and/or operated in such a way as to maintain a permanent pool. Wet ponds can be designed to provide extended detention of incoming flows using the volume above the permanent pool surface.

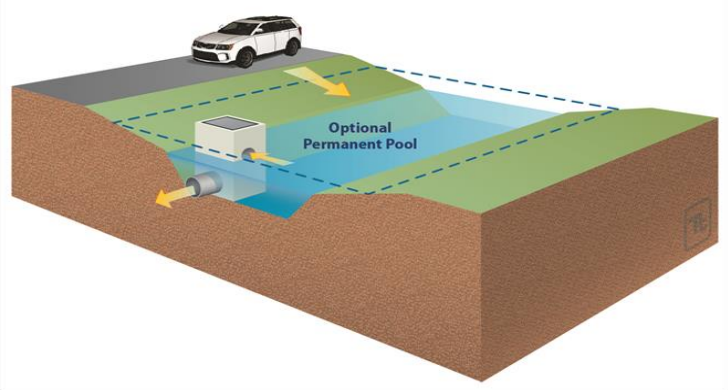


Figure 3-10: Wet detention basin schematic

Dry Extended Detention Basin

Dry extended detention basins are basins whose outlets have been designed to detain the stormwater runoff to allow particulates and associated pollutants to settle out. Dry extended detention basins do not have a permanent pool; they are designed to drain completely between storm events. They can also be used to provide hydromodification and/or flood control by modifying the outlet control structure and providing additional detention storage. The slopes, bottom, and forebay of Dry extended detention basins are typically vegetated.

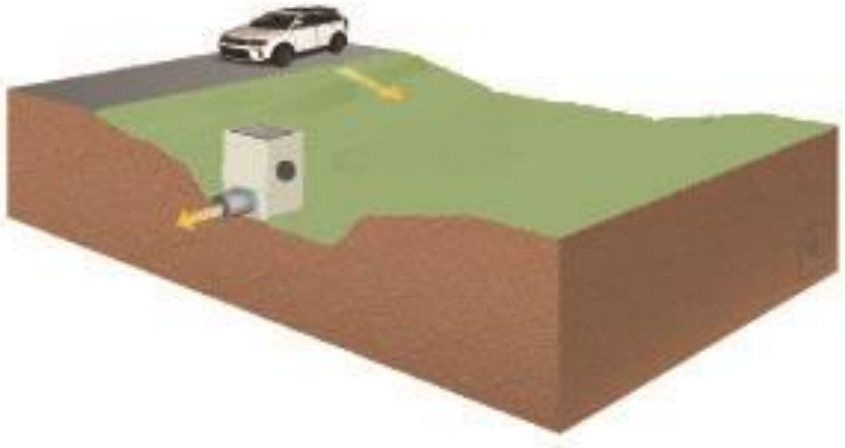


Figure 3-11: Dry extended detention basin schematic

PRE TREATMENT BMPS

Pre-treatment BMPs are typically not used as primary treatment; however, they are highly recommended for preliminary treatment in order to prolong the life and prevent clogging of the downstream system in a treatment train.

MEDIA FILTERS

Media filters are usually designed as multi-chambered stormwater practices; the first is a settling chamber, and the second is a filter bed filled with sand or another filtering media. As stormwater flows into the first chamber, large particles settle out, and then finer particles and other pollutants are removed as stormwater flows through the filtering medium. They can also be used as pre-treatment, with their location prior to any infiltration or biotreatment BMP.

CATCH BASIN INSERTS

Catch basins inserts typically include a grate or curb inlet and a sump to capture sediment, debris, and pollutants. Filter fabric can also be included to provide additional filtering of particles. The effectiveness of catch basins, their ability to remove sediments and other pollutants, depends on its design and maintenance. Some inserts are designed to drop directly into existing catch basins, while others may require retrofit construction. Similar to media filters, catch basin filters can also be used as a pre-treatment BMP for infiltration and biotreatment BMPs.

Figure 3-12: Pre-treatment BMP schematic

RAINFALL HARVEST

Rainfall Harvest BMPs capture rainwater to be reused in lieu of discharging directly to the MS4.

ABOVE GROUND CISTERNS

Cisterns are large above ground tanks that store stormwater collected from impervious surfaces for domestic consumption. Above ground cisterns are used to capture runoff. Mesh screens are typically used to filter large debris before the stormwater enters the cistern. The collected stormwater could potentially be used for landscape irrigation and some interior uses, such as toilets and washing machines. The collection and consumption of the stormwater results in pollution control, volume reduction, and peak flow reduction from the site.

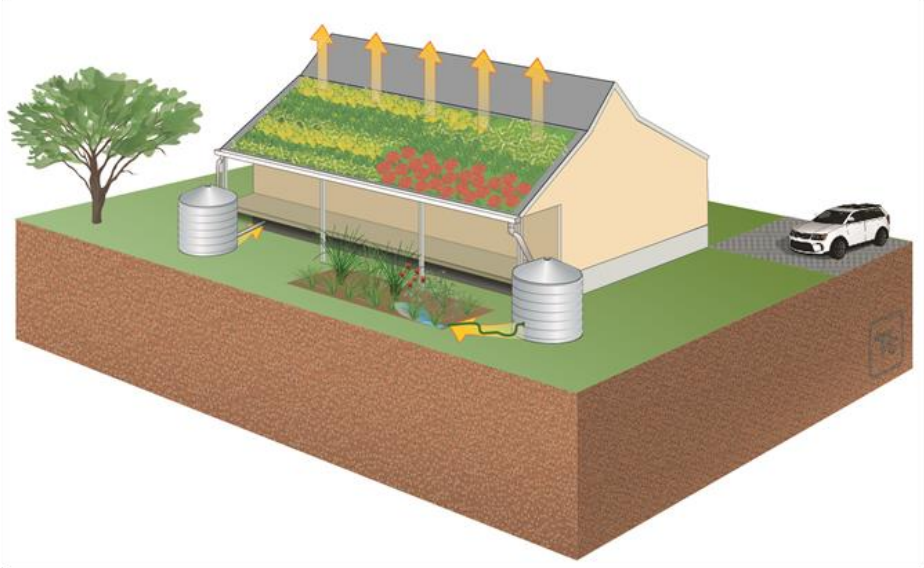


Figure 3-13: Above ground cisterns schematic

UNDERGROUND DETENTION

Underground detention systems function similarly to above ground cisterns in that they collect and use stormwater from impervious surfaces. These systems are concealed underground and can allow for larger stormwater storage and capture additional impervious surfaces not easily captured in an above ground system (e.g. parking lots and sidewalks).

Figure 3-14: Underground detention schematic

DIVERSION SYSTEMS

LOW FLOW DIVERSION

Flow diversion systems collect and divert runoff. Flow diversion structures can primarily be used in two ways. First, flow diversion structures may be used to direct dry weather flows to a treatment facility, preventing the runoff from reaching a receiving water body. This is typically done with low flow runoff, which occurs during periods of dry weather. Second, flow diversion structures can also be modified by incorporating them into other BMPs. For example, diverted flow can be fed into a regional BMP. Properly designed stormwater diversion systems are very effective for preventing stormwater from being contaminated and for routing contaminated flows to a proper treatment facility.

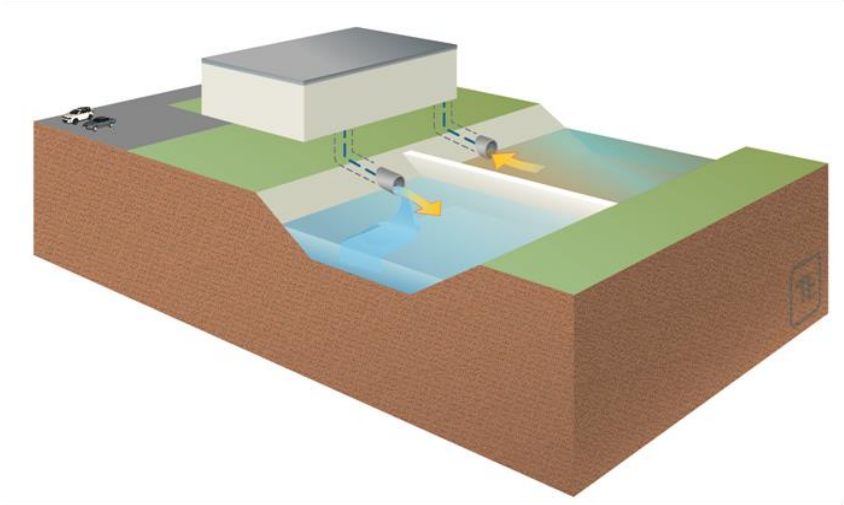


Figure 3-15: Low flow diversion schematic

3.4.2.2 PERFORMANCE EVALUATION OF STRUCTURAL BMPS

It is important to take the performance of stormwater BMPs into consideration during the planning and implementation process. This section provides an analysis of specific BMPs to determine the pollutant removal effectiveness of those BMPs. The International Stormwater BMP Database[4] (BMP Database) project website was used to analyze different BMP types for their effectiveness in removing specific pollutants. The website features a database of over 530 BMP studies, performance analysis results, BMP performance tools, monitoring guidance and other study-related publications. Performance studies relevant to BMPs matching the criteria for an effective regional or distributed application were analyzed to include the following:

- Bioretention
- Bioswale
- Detention Basin
- Grass Strip
- Porous Pavement
- Retention Pond
- Wetland Basin
- Wetland Channel

The average influent and effluent concentrations for the 95th percentile confidence interval were analyzed for pollutants of concern for the Lower San Gabriel River (LSGR) watershed available through the BMP Database. The following pollutants were analyzed:

- Arsenic (Dissolved)
- Arsenic (Total)
- Cadmium (Dissolved)
- Cadmium (Total)
- Chromium (Dissolved)
- Chromium (Total)
- Copper (Dissolved)
- Copper (Total)
- E. coli
- Enterococcus
- Fecal Coliform
- Lead (Dissolved)
- Lead (Total)
- Nickel (Dissolved)
- Nickel (Total)
- TSS
- Zinc (Dissolved)
- Zinc (Total)

The majority of the BMPs analyzed by the BMP Database project are located in major transportation corridors. Land use categories such as residential, commercial, and industrial are not heavily represented in the analysis. The BMP effectiveness may also vary with regional conditions. Many BMPs were monitored in areas where a higher intensity and volume of rainfall than LA County is observed. Additionally, some of the BMPs monitored were designed in the 1990s, 1980s, or earlier. These are expected to have been designed with less stringent guidelines resulting in a more conservative analysis. Although the conditions noted above may result in a slight variance in BMP effectiveness, the pollutant removal efficiencies are considered to be applicable.

It is important to note that the majority of pollutant load reduction is achieved using infiltration BMPs which result in an overall volume reduction. The analysis emphasizes reduction in concentrations of constituents, rather than volume or load reduction. Flow reduction analyses were not performed due to the dependence on rainfall intensity, soil types, and other site-specific conditions. The RAA has determined the volume reduction needed to meet compliance goals.

RESULTS

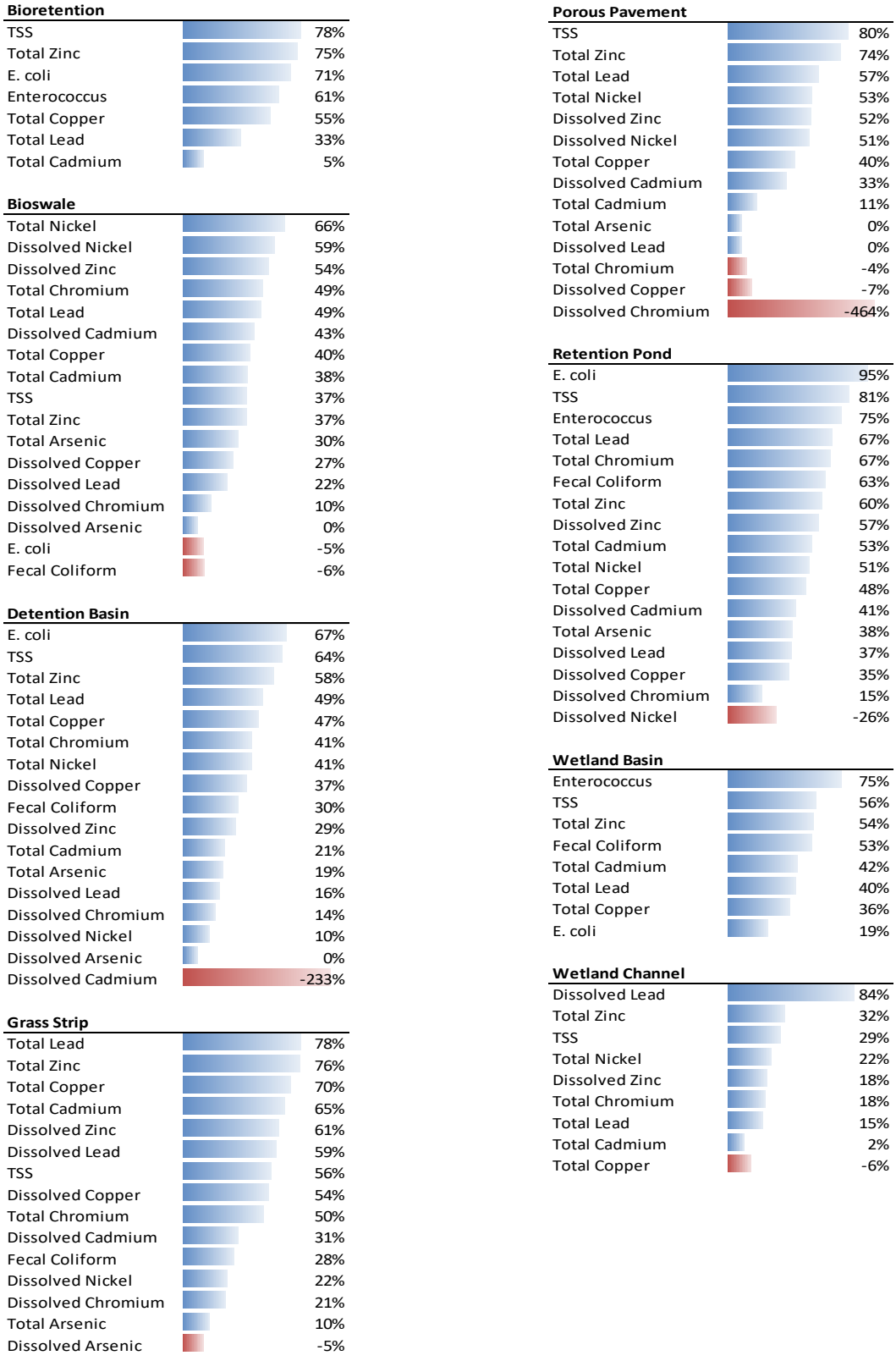
The analysis can be used to evaluate BMPs and support assumptions made in the RAA regarding effluent concentrations from specific BMPs. The required pollutant reductions determined through the RAA will be used to prioritize the BMPs to maximize effectiveness. The results of the BMP Database analysis are presented in a comparison format to easily visualize the pollutant removal efficiencies of each BMP type.

Each pollutant analyzed is a pollutant of concern for the LSGR WMP watersheds, with the exception of Total Suspended Solids (TSS). The reason for its inclusion is that studies have shown that there is a direct correlation between sediment concentration and various pollutants for which the watersheds are impaired. The data compiled from the BMP Database was used to determine the percent removal of each BMP for each pollutant. Each BMP was ranked in terms of pollutant removal efficiency for each pollutant type (see the *BMP Pollutant Removal Effectiveness Comparison Charts* Below). Data for specific pollutants was not available for each BMP; therefore, only available data is presented.

The next analysis included taking the data and grouping the removal efficiencies under each BMP type. The pollutants were then ranked in terms of pollutant removal efficiency for each BMP type (see the *BMP Type Comparison Charts for Pollutant Removal* below). Data for specific pollutants was not available for each BMP; therefore, only available data is presented.

[4] Geosyntec Consultants, Wright Water Engineers. International Stormwater Best Management Practices (BMP) Database Pollutant Category Summary Statistical Addendum: TSS, Bacteria, Nutrients, and Metals. July 2012.

BMP Pollutant Removal Effectiveness Comparison Charts



BMP Type Comparison Charts for Pollutant Removal

Influent/Effluent Summary Statistics for Dissolved Arsenic (µg/L)

BMP Type	In	Out	Percent Removal
Bioswale	0.6	0.6	0%
Detention Basin	1.04	1.04	0%
Grass Strip	0.61	0.64	-5%
Media Filter	0.53	0.62	-17%

Influent/Effluent Summary Statistics for Total Arsenic (µg/L)

BMP Type	In	Out	Percent Removal
Retention Pond	1.36	0.85	38%
Bioswale	1.68	1.17	30%
Detention Basin	2.21	1.78	19%
Grass Strip	1.04	0.94	10%
Porous Pavement	2.5	2.5	0%

Influent/Effluent Summary Statistics for Dissolved Cadmium (ug/L)

BMP Type	In	Out	Percent Removal
Bioswale	0.21	0.12	43%
Retention Pond	0.17	0.1	41%
Porous Pavement	0.06	0.04	33%
Grass Strip	0.13	0.09	31%
Detention Basin	0.15	0.5	-233%

Influent/Effluent Summary Statistics for Total Cadmium (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	0.52	0.18	65%
Retention Pond	0.49	0.23	53%
Wetland Basin	0.31	0.18	42%
Bioswale	0.5	0.31	38%
Detention Basin	0.39	0.31	21%
Porous Pavement	0.28	0.25	11%
Bioretention	0.99	0.94	5%
Wetland Channel	0.5	0.49	2%

Influent/Effluent Summary Statistics for Dissolved Chromium (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	2.13	1.68	21%
Retention Pond	1.18	1	15%
Detention Basin	1.25	1.08	14%
Bioswale	1.53	1.38	10%
Porous Pavement	0.5	2.82	-464%

Influent/Effluent Summary Statistics for Total Chromium (µg/L)

BMP Type	In	Out	Percent Removal
Retention Pond	4.09	1.36	67%
Grass Strip	5.49	2.73	50%
Bioswale	4.53	2.32	49%
Detention Basin	5.02	2.97	41%
Wetland Channel	1.72	1.41	18%
Porous Pavement	3.6	3.73	-4%

Influent/Effluent Summary Statistics for Dissolved Copper (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	11.66	5.4	54%
Detention Basin	5.56	3.52	37%
Retention Pond	6.57	4.24	35%
Bioswale	11.01	8.02	27%
Porous Pavement	5.37	5.75	-7%

Influent/Effluent Summary Statistics for Total Copper (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	24.52	7.3	70%
Bioretention	17	7.67	55%
Retention Pond	9.57	4.99	48%
Detention Basin	10.62	5.67	47%
Porous Pavement	13.07	7.83	40%
Bioswale	10.86	6.54	40%
Wetland Basin	5.61	3.57	36%
Wetland Channel	4.52	4.81	-6%

Influent/Effluent Summary Statistics for E. coli (#/100 mL)

BMP Type	In	Out	Percent Removal
Retention Pond	2800	150	95%
Bioretention	150	44	71%
Detention Basin	1300	429	67%
Wetland Basin	785	632	19%
Bioswale	3990	4190	-5%

Influent/Effluent Summary Statistics for Enterococcus (#/100 mL)

BMP Type	In	Out	Percent Removal
Retention Pond	615	153	75%
Retention Wetland Ba	615	153	75%
Bioretention	605	234	61%

Influent/Effluent Summary Statistics for Fecal Coliform (#/100 mL)

BMP Type	In	Out	Percent Removal
Retention Pond	1920	707	63%
Wetland Basin	13000	6140	53%
Detention Basin	1480	1030	30%
Grass Strip	32000	23200	28%
Bioswale	4720	5000	-6%

Influent/Effluent Summary Statistics for Dissolved Lead (µg/L)

BMP Type	In	Out	Percent Removal
Wetland Channel	3.26	0.52	84%
Grass Strip	0.64	0.26	59%
Retention Pond	0.76	0.48	37%
Bioswale	1.39	1.08	22%
Detention Basin	0.79	0.66	16%
Porous Pavement	0.5	0.5	0%

Influent/Effluent Summary Statistics for Total Lead (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	8.83	1.96	78%
Retention Pond	8.48	2.76	67%
Porous Pavement	4.3	1.83	57%
Detention Basin	6.08	3.1	49%
Bioswale	3.93	2.02	49%
Wetland Basin	2.03	1.21	40%
Bioretention	3.76	2.53	33%
Wetland Channel	2.94	2.49	15%

Influent/Effluent Summary Statistics for Dissolved Nickel (µg/L)

BMP Type	In	Out	Percent Removal
Bioswale	4.93	2.04	59%
Porous Pavement	0.88	0.43	51%
Grass Strip	2.68	2.09	22%
Detention Basin	2.82	2.55	10%
Retention Pond	1.68	2.11	-26%

Influent/Effluent Summary Statistics for Total Nickel (µg/L)

BMP Type	In	Out	Percent Removal
Bioswale	9.26	3.16	66%
Porous Pavement	3.64	1.71	53%
Retention Pond	4.46	2.19	51%
Grass Strip	5.41	2.92	46%
Detention Basin	5.64	3.35	41%
Wetland Channel	2.8	2.18	22%

Influent/Effluent Summary Statistics for TSS (mg/L)

BMP Type	In	Out	Percent Removal
Retention Pond	70.7	13.5	81%
Porous Pavement	65.3	13.2	80%
Bioretention	37.5	8.3	78%
Detention Basin	66.8	24.2	64%
Grass Strip	43.1	19.1	56%
Wetland Basin	20.4	9.06	56%
Bioswale	21.7	13.6	37%
Wetland Channel	20	14.3	29%

Influent/Effluent Summary Statistics for Dissolved Zinc (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	36.1	14	61%
Retention Pond	22.5	9.6	57%
Bioswale	52.7	24.5	54%
Porous Pavement	13.5	6.5	52%
Detention Basin	15.6	11.08	29%
Wetland Channel	11.6	9.5	18%

Influent/Effluent Summary Statistics for Total Zinc (µg/L)

BMP Type	In	Out	Percent Removal
Grass Strip	103.3	24.3	76%
Bioretention	73.8	18.3	75%
Porous Pavement	57.6	15	74%
Retention Pond	53.6	21.2	60%
Detention Basin	70	29.7	58%
Wetland Basin	48	22	54%
Bioswale	36.2	22.9	37%
Wetland Channel	23	15.6	32%

RESULTS ANALYSIS SUMMARY

The statistical analysis presented has many applications, including supporting BMP prioritization and the RAA analysis. As future applications are undertaken, the results can be analyzed in more detail. For this analysis, the following observations were discovered:

- Overall, the retention pond returned the best results in terms of pollutant removal efficiency for several pollutants, with more than 60% removal for E. coli, TSS, Enterococcus, total lead, fecal coliform, and total zinc.
- Among the constituents analyzed, the percent removals were often the highest for metals, lead and zinc in particular.
- The poorest performance was often observed for nutrients and bacteria, with concentrations increasing for some BMP types. Leaching of nutrients from soils/planting media and resuspension of captured pollutants may be a cause of the increases observed in these BMPs[5].

It is important to note that the majority of pollutant removal associated with stormwater BMPs will be due to infiltration and overall volume reduction. Although this is the case, a small component may be associated with inflow to outflow pollution concentration reduction and the analysis focuses on this percent reduction. Percent reduction is easily understandable and convenient for reporting; therefore, the method seems to be appropriate for this analysis. Refer to the article "Voodoo Hydrology" in the July 2006 article of Stormwater Magazine[6] for further information on caveats to this method. Although the analysis does not cover volume reduction, the RAA analysis has estimated the pollutant reduction necessary to meet compliance.

3.4.2.3 EXISTING TARGETED STRUCTURAL BMPS

The existing structural BMPs in place within the Watershed Group area have been included in the RAA model. Figure 3-16 indicates the locations of these existing BMPs. Refer to Chapter 4 for more details.

3.4.2.4 CONTROL MEASURES IDENTIFIED IN TMDLS, IMPLEMENTATION PLANS AND STATE AMENDMENTS

There are no control measures identified in the San Gabriel River Metals TMDL. Planned and potential control measures to address the Metals TMDL are incorporated within the WCMs identified in this Chapter.

The State Water Resources Control Board has adopted the Statewide Trash Amendments. The amendments include as a compliance route the installation of full-capture devices in the priority land use areas of high density residential, industrial, commercial, mixed urban and public transportation stations. These structural control measures are expected to result in significant reductions in trash loading. Also, since pollutants such as organics can adhere to plastic trash, secondary reductions for non-trash pollutants may be expected.

[5] Stormwater: BMP Effectiveness for Nutrients, Bacteria, Solids, Metals, and Runoff Volume (2012). Retrieved online at: http://www.stormh2o.com/

[6] http://www.stormh2o.com/SW/Editorial/Voodoo_Hydrology_37.aspx

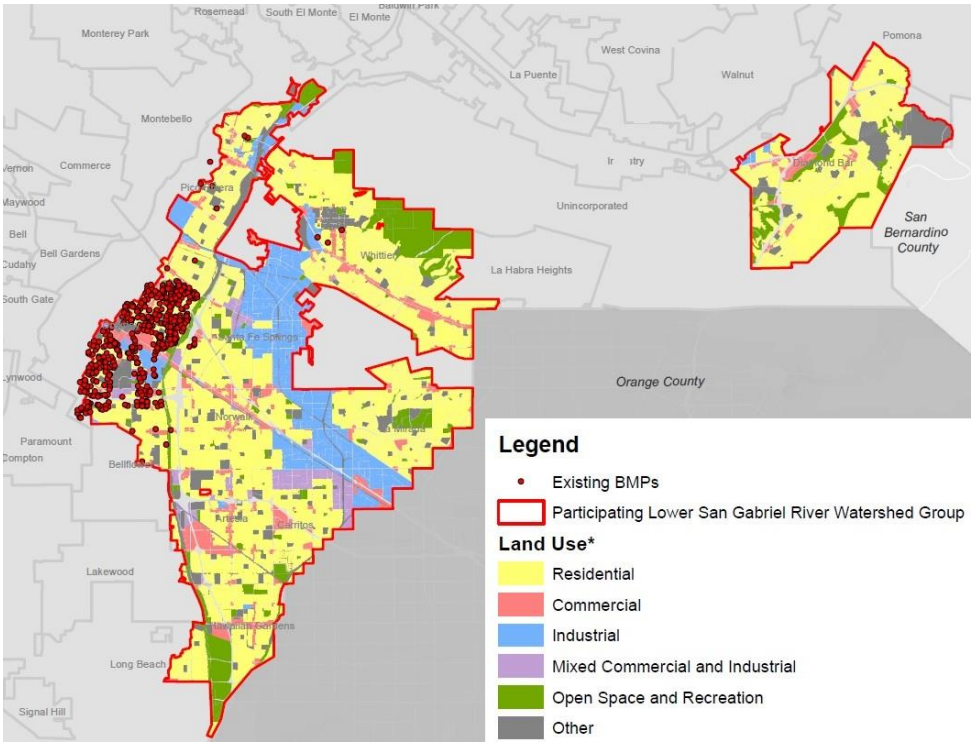


Figure 3-16: Locations of Existing Structural BMPs

3.4.2.5 Recently Completed and Planned Targeted Control Measures

The projects listed below have been planned to some extent by the Participating Agencies. A literature review was conducted of existing TMDL Implementation Plans, the existing IRWMP, and other planning documents to collect data. The development of these projects range from a roundtable discussion to completed installation and monitoring.

Gateway Multi-Agency, Multi-Watershed Project to Incorporate Low Impact Development (LID) BMPs into Major Transportation Corridors in the Gateway Region of Los Angeles (Gateway Prop 84 Project - **Grant Application Approved May 2014**

This project is a regional project within multiple cities including the cities of Downey, Norwalk, Santa Fe Springs, and Whittier. The Gateway Water Management Authority (GWMA) applied for funds through the Prop 84 Grant Round 2 program to put towards this project.

The project objective is to prevent stormwater contamination of surface waters in three watersheds, to include the San Gabriel River. This was accomplished by installing LID BMPs to treat stormwater runoff, and its associated pollutants. All BMP installations were completed by May 2017. Table 3-6 lists the BMPs to be implemented within the Cities and Figures 3-18 to 3-22 show the project locations within each city. See Section 5.2 for further details.

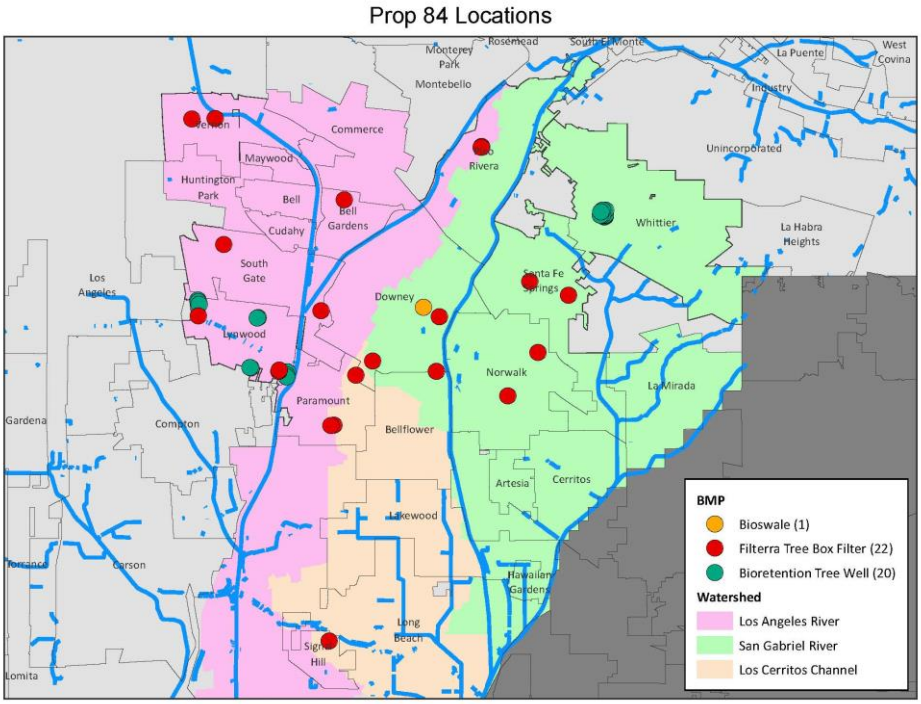


Figure 3-17: BMP Locations within the Gateway Prop 84 Project

Table 3-6: BMPs within the Gateway Prop 84 Project

City	LID BMPs	Location	Anticipated treatment[7]
Downey	(4) Tree box filters	(1) 12923 Barlin Avenue, north of Cheyenne Street (1) Westside of Bixler Avenue, north of Prichard Street and east of Downey Avenue (1) Eastside of Faust Avenue, north of Foster Road (1) Eastside of Pangborn Avenue, north of Firestone Boulevard	29,032 cf
	(1) Bioswale	(1) Firestone Blvd. at Stonewood Mall	11,741 cf
Norwalk	(2) Tree box filters	(1) Imperial Highway & Volunteer Ave (1) 14335 Pioneer Boulevard	14,516 cf
Santa Fe Springs	(2) Tree box filters	(1) Eastside of Norwalk Boulevard, south of Hawkins Street (1) Shoemaker Avenue, north of Sandoval Street	14,516 cf
Whittier	(10) Bioretention Tree Wells	(5) Comstock Avenue (3) Milton Avenue (2) Newlin Avenue	5,870 cf

[7] Treatment volume calculations based on a 24-hour, 0.75 in storm, 6x6 tree box filter units and a 1200 LF swale.

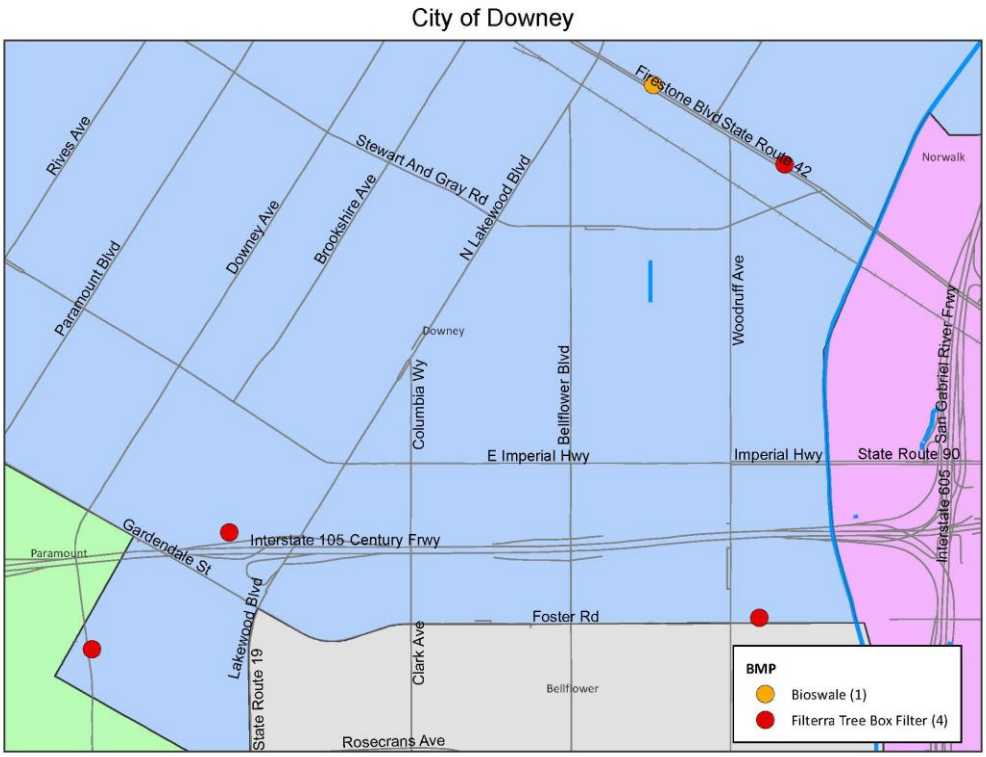


Figure 3-18: Gateway Prop 84 Project BMP locations proposed for the city of Downey

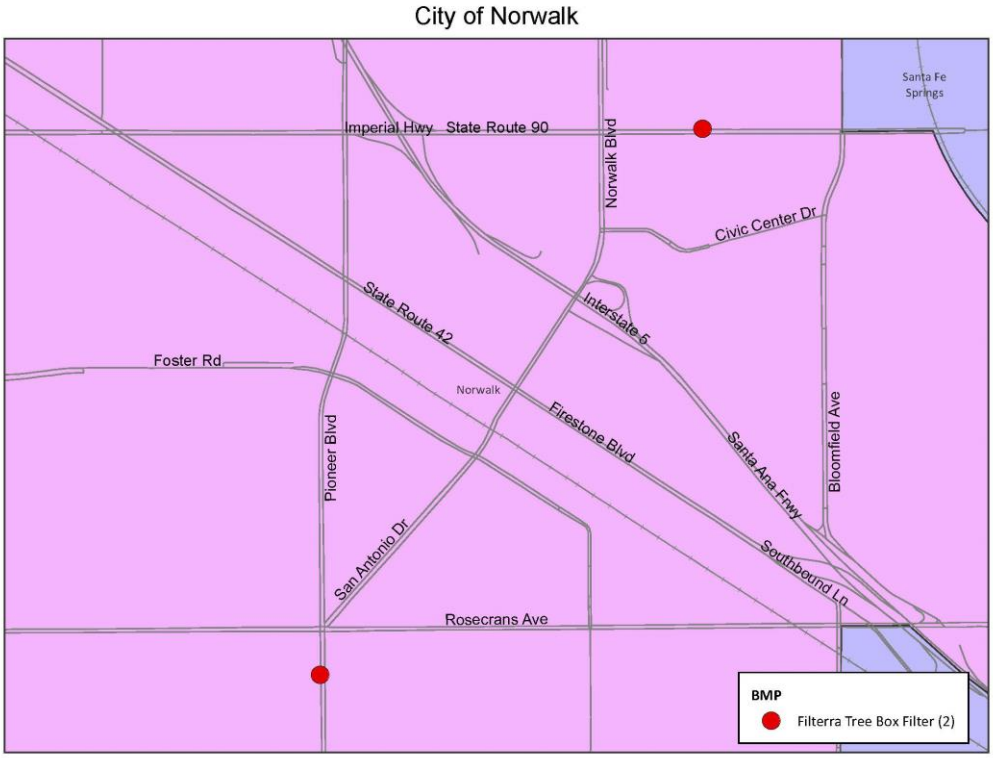


Figure 3-19: Gateway Prop 84 Project BMP locations proposed for the city of Norwalk

Figure 3-20: Gateway Prop 84 Project BMP locations proposed for the city of Santa Fe Springs

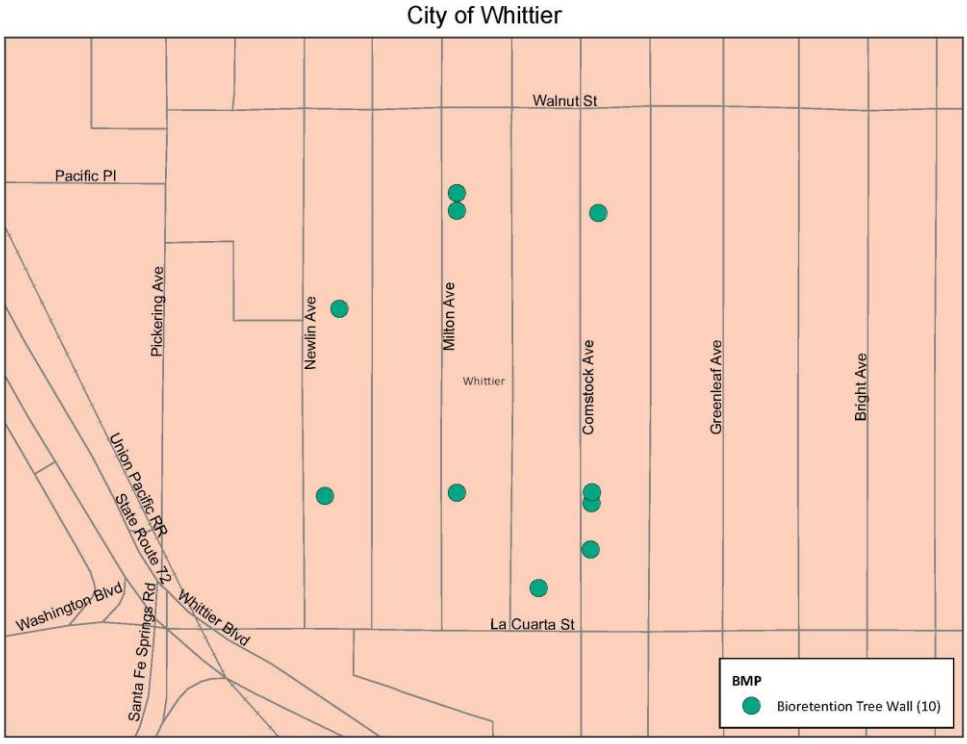


Figure 3-21: Gateway Prop 84 Project BMP locations proposed for the city of Whittier

IRWMP PROJECTS

The following project descriptions are from the Gateway Integrated Regional Watershed Management Plan (IRWMP). These projects have been discussed in detail with the Gateway Water Management Authority (GWMA) and are likely to be implemented once the required funding is acquired. Further details about each project can be found in the Gateway IRWMP documents.

BELLFLOWER NPDES PERMIT AND TMDL COMPLIANCE STORMWATER IMPROVEMENTS

This project will consist of installing catch basin automatic retractable screens (ARS), vegetated swales, bioretention systems, infiltration basins, porous pavement, and covered trash receptacles at various locations within the city of Bellflower. The specific locations have not yet been identified; therefore, as this project progresses the RAA results will be taken into consideration in order to place the BMPs in locations with the highest potential for pollutant loading reduction.

CONSTRUCT BIOSWALES/LANDSCAPING IN VARIOUS LOCATIONS IN LONG BEACH

This project will be located in the city of Long Beach and is planned to construct and/or reconstruct new and existing medians to capture and treat stormwater runoff. The specific locations have not yet been identified; therefore, as this project progresses the RAA results will be taken into consideration in order to place the BMPs in locations with the highest potential for pollutant loading reduction.

THE LOS CERRITOS, SAN GABRIEL RIVER AND ALAMITOS BAY LOW FLOW DIVERSION SYSTEM

This project will serve the cities of Long Beach, Bellflower, Norwalk, and Cerritos. The project plans to investigate sites along three waterbodies, to include the Lower San Gabriel River, to determine the feasibility of constructing Low Flow Diversion (LFD) Devices in locations that have high levels of metals and bacteria. This work will include the design and construction of four (4) LFDs that will be identified in the feasibility report. The specific locations have not yet been identified; therefore, as this project progresses the RAA results will be taken into consideration in order to place the BMPs in locations with the highest potential for pollutant loading reduction.

PUMP STATION VORTEX SEPARATION SYSTEM (VSS) DEVICES

This project will serve the cities of Long Beach, Bellflower, Norwalk, Cerritos and proposes to investigate sites upstream of the storm drain pump station along the Lower San Gabriel River to determine the feasibility of constructing Pre Filter Vortex Separation System Structural BMPs to capture trash, metals, and sediment possibly containing bacteria in five (5) locations. This project would provide a large amount of treatment in the San Gabriel River. The specific locations have not yet been identified; therefore, as this project progresses the RAA results will be taken into consideration in order to place the BMPs in locations with the highest potential for pollutant loading reduction.

3.4.2.6 POTENTIAL SITES FOR TARGETED CONTROL MEASURES

A preliminary assessment has been performed for the Lower San Gabriel River Watershed to determine potential areas to locate regional BMPs. This was done with a preliminary GIS approach by screening areas within 660 feet (1/8 mile) of a waterbody and currently designated as open space as well as other potentially useful zoning designations. The overall size of each site was used to calculate the maximum amount of volume which could be stored at the site and the maximum amount of area that could be diverted to the site assuming the entire site were redeveloped to incorporate infiltration.

The equations used were derived from the Orange County Technical Guidance Document (OC TGD)[8] and can be found below:

$$DCV = CdA_{TRIBUTARY} \times \left(\frac{43560}{12}\right)$$

Driving Equation No. 1

$$D_{MAX} = K_{DESIGN} T \times \left(\frac{1}{12}\right)$$

Assume K_{DESIGN} = 0.3 in/hr

0.3 in/hr is the lowest infiltration rate where infiltration is deemed feasible per the MS4 Permit.

$$D_{MAX} = 0.3 \times 48 \times \frac{1}{12} = 1.2 \text{ feet}$$

$$A_{BMP} = \frac{DCV}{D_{MAX}}$$

$$A_{TRIBUTARY} = \frac{A_{BMP} \times 1.2}{Cd \times \left(\frac{43560}{12}\right)}$$

Driving Equation No. 2

$$C = (0.75 \times IMP) + 0.15 = 0.9$$

Assume 100% imperviousness

Assume d=1.1

1.1 inches is the highest depth on the LA County 85th Percentile Isohyetal Map for the LSGR watershed.

$$A_{TRIBUTARY} = \frac{A_{BMP} \times 1.2}{0.9 \times 1.1 \times \left(\frac{43560}{12}\right)}$$

Final Equation No. 1

$$DCV = A_{BMP} \times 1.2$$

Final Equation No. 2

A_{BMP} has been assumed to be the total site area to determine the maximum tributary area that can be diverted to the site and the maximum volume the site can treat.

Where:

DCV:	Design Capture Volume	$A_{TRIBUTARY}$:	Area Tributary to BMP	T:	Drawdown Time
C:	Runoff Coefficient	D_{MAX}:	Maximum Effective Depth	A_{BMP}:	Footprint Area of BMP
d:	Rainfall Depth	K_{DESIGN}:	Design Infiltration Rate	IMP:	Percent Impervious

[8] Orange County. *Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs).* May 19, 2011.

The sites are in various stages of soil testing for infiltration rates. The cities are currently seeking funding for these projects. The City of Bellflower received $13 million in grant funding from Caltrans for constructing various stormwater treatment and capture BMPs at Caruthers Park. The site has the potential to house a 9 acre-feet infiltration vault that could receive runoff from approximately 1,500 acres of drainage area.

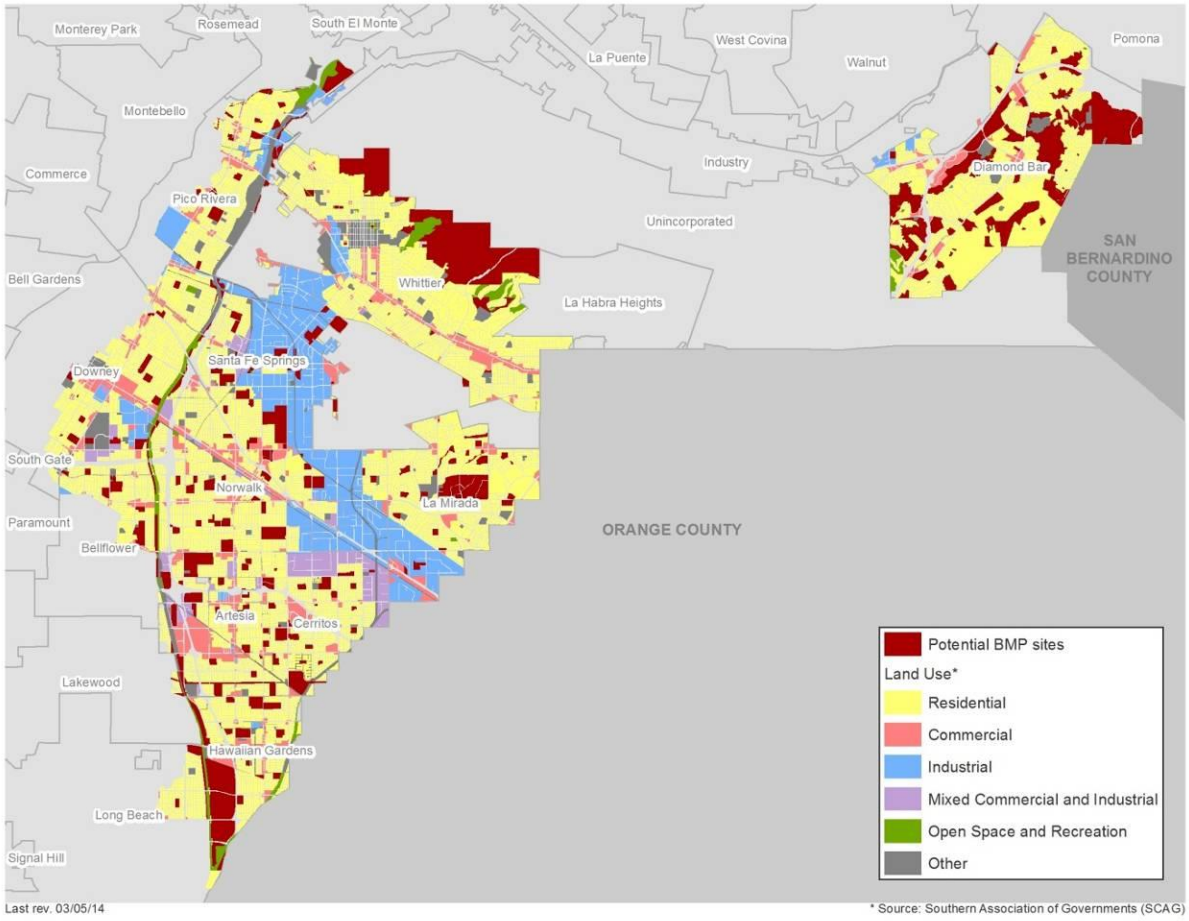


Figure 3-22: Potential Sites for Future Structural BMPs

Figure 3-23 indicates the locations of sites potentially available for future regional BMPs. Additionally, Table 3-7 and Table 3-8 indicate the locations of sites potentially available for future regional BMPs within the Coyote Creek Watershed and the San Gabriel River Watershed, respectively. These locations can serve as a starting point during the implementation phase of the WMP. They have been grouped by jurisdiction and listed in order by land use. The land use with the highest accessibility is listed first. Within each land use designation, the sites have been listed from largest to smallest. Note that with regional BMPs there are opportunities for multiple agencies to benefit from the same site. The land uses are ranked as follows:

OPEN SPACE AND RECREATION: Sites designated for open space, parks, and recreational activities were ranked with the highest potential for future regional BMPs. The reasoning being that these

types of areas have the highest likeliness to be publically owned and not require land acquisition, generally have a high percentage of landscaped area available, and have a high opportunity for multiple benefits.

EDUCATIONAL USE: Sites designated for educational use were ranked with the second highest potential for future regional BMPs. The reasoning being that these types of areas although not city-owned could have an easier land acquisition process than privately owned land, generally have a high percentage of landscaped area available, and have a high opportunity for multiple benefits.

GOVERNMENT INSTITUTION: Sites designated for educational use were ranked with the third highest potential for future regional BMPs. This is due to the institution being government owned presenting a higher chance of collaboration than a privately owned facility. Although this may be the case, many government institutions may not be willing to take on maintenance responsibilities which would result in the necessity of land acquisition or maintenance agreements.

GOLF COURSES/ COUNTRY CLUBS: Sites designated for golf courses or country clubs were ranked with the fourth highest potential for future regional BMPs. The reasoning being that these types of areas generally have a high percentage of landscaped area available and have a high opportunity for multiple benefits. Although this may be the case, land acquisition for these sites is expected to be a difficult accomplishment.

COMMERCIAL USE: Sites designated for commercial areas were ranked with the fifth highest potential for future regional BMPs. The reasoning being that these types of areas generally have a high percentage of parking area available which could potentially be retrofitted for infiltration opportunities. Although this may be the case, land acquisition for these sites is expected to be a difficult accomplishment.

The available sites will be further assessed to determine the best location for a regional BMP. Note that the sites presented do not represent the only sites available for the Watershed Group. The ultimate site selection process should take into account the following characteristics:

LOCATION IN RELATION TO RAA RESULTS: The RAA provides an estimation of runoff reduction to be provided in each area in order to meet the water quality objectives. The sites should be selected taking this into consideration.

GIS DATA: GIS data should be further analyzed to screen projects based on criteria such as land use, topography, hydrologic features, streets and roads, existing storm drain infrastructure, and storm drain invert depth.

PROJECT BENEFITS: It is preferred that a project contains multiple benefits in order to increase the overall benefit and support for the project. Benefits to take into consideration include, but are not limited to, the following:

- Water quality benefits
- Water supply benefits

- Recreational use
- Multi-agency benefits
- Publically owned
- Storage availability
- Funding available
- Project readiness
- Flood control benefits
- Proximity to pollutant sources or impaired waters
- Adjacent to existing storm drain

PROJECT CONSTRAINTS: Not every project will be feasible; therefore, it is important to take into consideration any constraints that may result in project infeasibility. These constraints include, but are not limited to, the following:

- High groundwater
- Low infiltration rates
- Existing soil contamination/proximity to existing soil contamination
- Brownfields[9]
- Existing groundwater contamination/proximity to existing groundwater contamination
- Potential for soil instability (liquefaction zones, hillside areas)
- Existing private ownership (requires land acquisition)
- Cost Effectiveness
- Historical landmarks

[9] With certain legal exclusions and additions, the term "brownfield site" means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant (*Environmental Protection Agency*).

Table 3-7: Potential site list for Coyote Creek Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[10]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Artesia	Open Space and Recreation	Artesia Park	18750 Clarkdale Ave.	33.8598	-118.0781	13.7	200	16.5
		Padelford Park	11870 169th Street	33.8769	-118.0788	1.3	19	1.6
	Educational Use	Middle School	Excluded for privacy			18.1	263	21.7
		Elementary School	Excluded for privacy			9.2	134	11.1
		Elementary School	Excluded for privacy			7.0	102	8.4
		Elementary School	Excluded for privacy			5.4	79	6.5
	Commercial Use	Lot	Excluded for privacy			1.0	14	1.1
Cerritos	Open Space and Recreation	Cerritos Park East	13234 E. 166th St.	33.8787	-118.0498	26.9	390	32.2
		Heritage Park	19211 Studebaker Rd.	33.8632	-118.0616	12.5	181	14.9
		Gridley Park	18600 Bloomfield Ave.	33.8499	-118.09	10.4	151	12.4
		Jose A. Gonsalves Park	Gridley Rd. and Yearling	33.8814	-118.0414	9.5	138	11.4
		Frontier Park	13611 E. 166th St.	33.8776	-118.0599	6.2	90	7.4
		El Rancho Verde Park	16910 Maria Ave.	33.8501	-118.0525	5.8	84	6.9
		Jacob Park	7815 Denni St.	33.8499	-118.0744	5.2	75	6.2
		Sunshine Park	19310 Vickie Ave	33.8557	-118.0528	4.1	60	4.9
		Friendship Park	13650 Acoro St.	33.8716	-118.0405	3.8	56	4.6
		Pat Nixon Park	12340 South St.	33.8577	-118.0683	2.8	40	3.3
		Brookhaven Park	13101 Brookhaven St.	33.8661	-118.0508	2.6	38	3.1
		Satellite Park (Residential Mixed Density)	12412 Mountain Creek Rd.	33.8828	-118.0678	1.9	28	2.3
		Saddleback Park	13037 Acoro St.	33.8723	-118.0539	1.5	22	1.8
		Cerritos Regional Park	19700 Bloomfield Ave.	33.8486	-118.0581	79.7	1160	95.7
		Loma Park	17503 Stark Ave.	33.8718	-118.068	0.8	12	1.0
	Government Institution	Cerritos Sculpture Garden and City Hall	18125 Bloomfield Ave.	33.8663	-118.0666	1.4	21	1.7

[10] These numbers were generated using the Los Angeles County GIS Data Portal website (http://egis3.lacounty.gov/dataportal/) and the LA County Department of Public Works Spatial Information Library website (http://dpw.lacounty.gov/general/spatiallibrary/index.cfm?agree=agree). All areas may not be usable space for BMP retrofits.

Table 3-7: Potential site list for Coyote Creek Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[10]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Cerritos	Educational Use	High School	Excluded for privacy			29.0	422	34.8
		Middle School	Excluded for privacy			21.5	313	25.8
		Adult School	Excluded for privacy			18.4	267	22.1
		Middle School	Excluded for privacy			15.6	226	18.7
		High School	Excluded for privacy			12.5	182	15.0
		High School	Excluded for privacy			10.6	155	12.8
		Elementary School	Excluded for privacy			9.6	139	11.5
		Elementary School	Excluded for privacy			8.7	126	10.4
		Middle School	Excluded for privacy			8.6	125	10.3
		Elementary School	Excluded for privacy			8.5	124	10.2
		Elementary School	Excluded for privacy			8.5	123	10.2
		Elementary School	Excluded for privacy			7.9	115	9.5
		Elementary School	Excluded for privacy			7.9	115	9.5
		Elementary School	Excluded for privacy			7.9	114	9.4
		Elementary School	Excluded for privacy			7.3	106	8.8
		Elementary School	Excluded for privacy			6.6	97	8.0
		Elementary School	Excluded for privacy			4.1	59	4.9
Diamond Bar	Open Space and Recreation	County park	-	33.9820	-117.8188	149.5	2174	179.4
		open space	896 Terrace Ln W	34.0011	-117.8215	123.6	1798	148.3
		Pantera Park and Diamond Bar City Parkland	738 Pantera Dr.	34.0077	-117.7895	108.4	1577	130.1
		Maple Hill Park	1355 Maple Hill Rd.	33.9962	-117.8265	5.5	79	6.5
		Paul C. Grow Park	23281 E. Forest Canyon Rd.	33.9949	-117.8111	3.5	51	4.2
		Summit Ridge Park	1425 Summitridge Dr.	34.0000	-117.7958	1.1	15	1.3
	Educational Use	High School	Excluded for privacy			32.5	473	39.0
		Elementary School	Excluded for privacy			2.5	37	3.0
		Elementary School	Excluded for privacy			8.7	127	10.5
		Elementary School	Excluded for privacy			8.2	120	9.9
		Elementary School	Excluded for privacy			8.0	116	9.6

Table 3-7: Potential site list for Coyote Creek Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[10]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
		Elementary School	Excluded for privacy			7.2	104	8.6
Hawaiian Gardens	Educational Use	Middle School	Excluded for privacy			15.9	231	19.1
		Elementary School	Excluded for privacy			8.0	116	9.6
		Elementary School	Excluded for privacy			6.0	87	7.2
La Mirada	Open Space and Recreation	La Mirada Regional Park	Alicanted Rd. & Adelfa Dr.	33.9083	-118.006	81.1	1179	97.3
		La Mirada Creek Park	12021 Santa Gertrudes Ave.	33.9211	-117.998	15.6	227	18.7
		Behringer Park	15900 Alicante Dr.	33.9017	-117.9883	11.1	161	13.3
		La Mirada Pool	13701 Adelfa Dr.	33.9053	-118.0089	9.7	141	11.7
		Neff Park	14300 San Cristobal Dr.	33.8981	-118.0259	9.0	130	10.7
		park	15635 Yellowbrook Ln.	33.9151	-117.9986	1.9	28	2.3
		Anna J. Martin Park	16135 Avenida San Martin	33.9134	-117.9863	1.9	27	2.3
	Educational Use	University	Excluded for privacy			53.8	782	64.5
		High School	Excluded for privacy			31.5	458	37.8
		Middle School	Excluded for privacy			18.4	267	22.0
		Elementary School	Excluded for privacy			11.8	171	14.1
		Elementary School	Excluded for privacy			8.3	121	10.0
		Middle School	Excluded for privacy			7.6	110	9.1
		Middle School	Excluded for privacy			7.3	106	8.7
		Elementary School	Excluded for privacy			7.2	105	8.7
		School	Excluded for privacy			7.0	102	8.4
		Elementary School	Excluded for privacy			6.9	101	8.3
		Elementary School	Excluded for privacy			6.5	95	7.8
	Golf Courses/ Country Clubs	Golf Course	Excluded for privacy			127.4	1853	152.9
	Commercial Use	Lot	Excluded for privacy			1.5	22	1.8
Lakewood	Open Space and Recreation	Palms Park	12305 207th St.	33.8433	-118.0703	19.1	278	22.9
		Bloomfield Park	21420 Pioneer Blvd.	33.8355	-118.0807	13.7	200	16.5
	Educational Use	Elementary School	Excluded for privacy			5.8	84	6.9
		High School	Excluded for privacy			30.5	443	36.6

Table 3-7: Potential site list for Coyote Creek Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[10]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
		Elementary School	Excluded for privacy			11.9	173	14.3
Long Beach	Open Space and Recreation	El Dorado East Regional Park	7550 E. Spring St.	33.8229	-118.087	651.1	9470	781.3
	Government Institution	LACSD lot	-	33.798	-118.0884	7.3	107	8.8
	Educational Use	Academy	Excluded for privacy			10.3	149	12.3
	Commercial Use	Church	Excluded for privacy			4.4	63	5.2
Norwalk	Open Space and Recreation	John Zimmerman Park	13031 Shoemaker Ave.	33.9122	-118.0569	13.2	192	15.9
		Hermosillo Park	11959 162nd St.	33.885	-118.0772	8.7	126	10.4
		Norwalk Park	1300 Clarkdale Park	33.9097	-118.0719	6.8	100	8.2
		Holifield Park[11]	15021 Bloomfield Ave.	33.8932	-118.0665	22.7	331	27.3
	Government Institution	Norwalk City Hall	12700 Norwalk Blvd.	33.9158	-118.0712	9.5	139	11.4
	Educational Use	High School and Elementary School	Excluded for privacy			28.5	414	34.1
		High School	Excluded for privacy			27.1	395	32.6
		Junior High School	Excluded for privacy			8.1	117	9.7
		Middle School	Excluded for privacy			14.4	209	17.2
		Middle School	Excluded for privacy			10.5	153	12.6
		Elementary School	Excluded for privacy			9.7	140	11.6
		Elementary School	Excluded for privacy			8.2	119	9.8
		Elementary School	Excluded for privacy			6.1	88	7.3
		Elementary School	Excluded for privacy			5.6	82	6.7
	Golf Courses/ Country Clubs	Golf Center	Excluded for privacy			11.5	167	13.7

[11] Holifield Park may have soil and groundwater contamination. Proof of this contamination has not yet been provided; therefore, it was not removed from the list, but ranked accordingly.

Table 3-7: Potential site list for Coyote Creek Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[10]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
	Commercial Use	lot	Excluded for privacy			5.3	77	6.4
Santa Fe Springs	Educational Use	High School	Excluded for privacy			12.6	183	15.1
		Elementary School	Excluded for privacy			12.3	178	14.7
Whittier	Open Space and Recreation	Arroyo Pescadero Park (Puente Hills Preserve)	7531 Colima Rd.	33.9843	-118.0088	1247.6	18146	1,497.1
		Parnell Park	15390 Lambert Rd.	33.9364	-118.0021	11.2	163	13.5
		Michigan Park	8228 Michigan Ave.	33.9642	-118.0215	10.0	145	12.0
		York Field Park	9110 Santa Fe Springs Rd.	33.9574	-118.0509	8.8	128	10.6
		Founders Memorial Park	6755 Newlin Ave.	33.9868	-118.0468	5.9	86	7.1
		Leffingwell Ranch Park	10537 Saint Gertrudes	33.9396	-117.9945	4.1	59	4.9
		John Greenleaf Whittier Park	7211 Whittier Ave.	33.9763	-118.0438	2.0	30	2.4
		Central Park	13212 Park St.	33.9813	-118.0344	1.7	25	2.0
		Kennedy Park	8530 Painter Ave.	33.9599	-118.0352	1.5	22	1.8
		Anaconda Park	14575 Anaconda St.	33.9507	-118.0131	1.0	15	1.2
		Laurel Park	8825 Jacmar Ave.	33.9562	-118.0288	0.8	12	1.0
	Educational Use	High School	Excluded for privacy			34.5	501	41.3
	Golf Courses/ Country Clubs	Country Club	Excluded for privacy			140.1	2038	168.1

Table 3-8: Potential site list for San Gabriel River Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[12]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Bellflower	Open Space and Recreation	T. Mayne Thompson Park	14001 Bellflower Blvd.	33.905	-118.1265	11.3	164	13.5
		Caruthers Park North	East of 16804 View Park Ave.	33.8822	-118.1089	6.1	88	7.3
		Byron Zinn Park	13600 Carfax Ave.	33.9070	-118.1101	3.2	46	3.8
		utility corridor	19706 Studebaker Rd.	33.8901	-118.1094	35.5	516	42.5
		Caruthers Park	10500 Flora Vista St.	33.8788	-118.1101	20.0	291	24.0
		Vacant lot	10525 Trabuco	38.8875	-118.1105	1.0	15	1.2
	Educational Use	Middle School and High School	Excluded for privacy			40.1	584	48.2
		High School	Excluded for privacy			24.6	357	29.5
		Elementary School	Excluded for privacy			7.4	107	8.8
		Elementary School	Excluded for privacy			5.5	79	6.6
		Elementary School	Excluded for privacy			3.7	54	4.5
Cerritos	Open Space and Recreation	Liberty Park	19211 Studebaker Rd.	33.8550	-118.1013	17.6	256	21.2
		Reservoir Hill Park	16733 Studebaker Rd.	33.8788	-118.1007	4.6	67	5.6
		Westgate Park	18830 San Gabriel Ave.	33.8594	-118.1039	4.5	66	5.5
	Educational Use	College	Excluded for privacy			118.6	1725	142.3
		High School	Excluded for privacy			35.2	511	42.2
		High School and Junior High School	Excluded for privacy			21.5	313	25.8
	Golf Courses/ Country Clubs	Golf Course	Excluded for privacy			31.2	454	37.5
Diamond Bar	Open Space and Recreation	Sycamore Canyon Park	22930 E. Golden Springs Dr	34.0058	-117.8088	47.0	683	56.4
		Diamond Bar Pony Baseball Fields	22601 Sunset Crossing Rd.	34.0315	-117.8205	12.7	185	15.2

[12] These numbers were generated using the Los Angeles County GIS Data Portal website (http://egis3.lacounty.gov/dataportal/) and the LA County Department of Public Works Spatial Information Library website (http://dpw.lacounty.gov/general/spatiallibrary/index.cfm?agree=agree). All areas may not be usable space for BMP retrofits.

Table 3-8: Potential site list for San Gabriel River Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[12]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Diamond Bar	Open Space and Recreation	Carlton J. Peterson Park	24142 E. Sylvan Glen Rd.	34.0288	-117.7945	8.4	122	10.1
		Ronald Reagan Park	2201 Peaceful Hills Rd.	33.9823	-117.853	5.8	85	7.0
	Educational Use	Middle School	Excluded for privacy			25.5	371	30.6
		Middle School	Excluded for privacy			13.3	194	16.0
		Elementary School	Excluded for privacy			11.2	163	13.5
		Elementary School	Excluded for privacy			6.7	97	8.0
		Elementary School	Excluded for privacy			6.6	96	7.9
		Elementary School	Excluded for privacy			6.1	88	7.3
	Golf Courses/ Country Clubs	Golf Course	Excluded for privacy			170.6	2482	204.7
	Commercial Use	Church	Excluded for privacy			3.8	56	4.6
Downey	Open Space and Recreation	Wilderness Park	10999 Little Lake Rd.	33.9359	-118.1013	20.6	300	24.7
		Rio San Gabriel Park	9612 Ardine St.	33.9312	-118.1092	15.7	228	18.8
		Independence Park	12334 Bellflower Blvd.	33.9196	-118.1231	11.7	171	14.1
		Dennis The Menace Park	9125 Arrington Ave.	33.9558	-118.1115	6.5	94	7.8
		utility corridor	9073 Gardendale St.	33.9157	-118.1122	3.5	51	4.2
		Brookshire Childrens Park	10050 Imperial Hwy.	33.9212	-118.1424	1.2	18	1.5
	Educational Use	High School	Excluded for privacy			19.4	282	23.3
		Middle School	Excluded for privacy			17.9	261	21.5
		Adult School	Excluded for privacy			15.5	226	18.6
		Middle School	Excluded for privacy			14.3	207	17.1
		Elementary School	Excluded for privacy			11.5	167	13.8
		High School	Excluded for privacy			8.2	119	9.8
		Elementary School	Excluded for privacy			7.6	110	9.1
		Elementary School	Excluded for privacy			6.4	92	7.6
		Elementary School	Excluded for privacy			5.4	78	6.4
Lakewood	Open Space	Rynerson Park	20711 Studebaker Rd.	33.8416	-118.0952	58.5	851	70.2

Table 3-8: Potential site list for San Gabriel River Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[12]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Lakewood	and Recreation							
		Boyar Park	4936 Stevely Ave.	33.8468	-118.1003	4.1	59	4.9
	Open Space and Recreation	Open Space Trail	5104 Stevely Ave.	33.8503	-118.101	3.5	51	4.2
Long Beach	Open Space and Recreation	utility corridor	3506 Stevely Ave.	33.8211	-118.0924	20.9	304	25.1
		Camp Fire Long Beach Area Council	7070 Carson St.	33.8315	-118.0966	6.1	89	7.4
	Educational Use	High School	Excluded for privacy			18.7	272	22.5
		Elementary School	Excluded for privacy			6.5	94	7.8
Norwalk	Open Space and Recreation	Arthur Gerdes Park	14700 Gridley Rd.	33.897	-118.0899	8.1	117	9.7
		New River Park	13432 Halcourt Ave.	33.9083	-118.1017	4.5	66	5.5
		Orr Park	12130 S. Jersey Ave.	33.921	-118.0845	3.5	51	4.2
		Glazier Park	10801 Fairton St.	33.8951	-118.1039	1.9	28	2.3
	Educational Use	High School	Excluded for privacy			19.2	280	23.1
		Middle School	Excluded for privacy			14.1	205	16.9
		Elementary School	Excluded for privacy			8.5	123	10.2
		Elementary School	Excluded for privacy			3.2	46	3.8
		Elementary School	Excluded for privacy			6.6	96	8.0
		Elementary School	Excluded for privacy			3.1	44	3.7
		Elementary School	Excluded for privacy			6.6	96	7.9
		Elementary School	Excluded for privacy			5.6	81	6.7
		Elementary School	Excluded for privacy			5.5	80	6.6
		Elementary School	Excluded for privacy			5.4	79	6.5
Pico Rivera	Open Space and Recreation	Pico Rivera Bicenntenial Park	11003 Rooks Rd.	34.0243	-118.0468	98.7	1436	118.4
		Smith Park	6016 Rosemead Blvd.	33.9904	-118.0897	15.7	228	18.8
		Streamland Park	3539 Durfee Ave.	34.02	-118.0718	14.1	206	17.0
		Pico Park	9528 Beverly Blvd.	34.0074	-118.0739	10.8	157	12.9
		Park	8717 E. Beverly Blvd.	34.0122	-118.0854	0.2	3	0.3
	Government Institution	Whittier Pumping Plant	4128 San Gabriel River Pkwy	34.0106	-118.0678	6.5	94	7.8

Table 3-8: Potential site list for San Gabriel River Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[12]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Pico Rivera	Educational Use	High School	Excluded for privacy			20.5	298	24.6
		Continuation School	Excluded for privacy			12.1	176	14.6
		Elementary School	Excluded for privacy			11.1	162	13.3
		Elementary School	Excluded for privacy			8.3	120	9.9
		Elementary School	Excluded for privacy			7.8	113	9.3
		Elementary School	Excluded for privacy			6.5	95	7.8
		Elementary School	Excluded for privacy			6.4	94	7.7
		Elementary School	Excluded for privacy			6.3	92	7.6
		Elementary School	Excluded for privacy			4.8	70	5.8
	Educational Use	Elementary School	Excluded for privacy			4.7	68	5.6
		Middle School	Excluded for privacy			3.6	52	4.3
		School	Excluded for privacy			3.3	48	3.9
		Elementary School	Excluded for privacy			2.7	40	3.3
		Library	Excluded for privacy			1.3	19	1.6
	Commercial Use	Church	Excluded for privacy			1.3	20	1.6
Santa Fe Springs	Open Space and Recreation	Santa Fe Springs Park	10068 Cedardale Dr.	33.9454	-118.0976	13.8	200	16.5
		Lake Center Park	11641 Florence Ave.	33.936	-118.0853	11.4	166	13.7
		Los Nietos Park	11143 Charlesworth Rd.	33.9558	-118.0835	9.9	145	11.9
		utility corridor	Next to San Gabriel River freeway	33.9642	-118.0863	9.0	131	10.8
		Little Lake Park	10900 Pioneer Blvd.	33.9331	-118.0775	8.8	128	10.6
		Santa Fe Springs City Baseball	9730 Pioneer Blvd.	33.9518	-118.0824	6.4	94	7.7
		utility corridor	Next to San Gabriel River mid trail	33.9543	-118.0898	5.2	76	6.3
		utility corridor	Next to San Gabriel River mid trail	33.9610	-118.0865	3.1	44	3.7
		Lakeview Park	10225 S. Jersey Ave.	33.943	-118.0898	2.1	30	2.5
		park	9918 Cedardale Dr.	33.9497	-118.0926	2.0	30	2.4

Table 3-8: Potential site list for San Gabriel River Sub-watershed

City Name	Land Use Designation	Site Name	Address	Latitude	Longitude	Approx. Site Area (Acres)[12]	Max Tributary Area ($A_{TRIBUTARY}$, Acres)	Max Design Capture Volume (DCV, Ac-ft)
Santa Fe Springs	Educational Use	High School	Excluded for privacy			23.6	343	28.3
		High School	Excluded for privacy			9.3	136	11.2
		Elementary School	Excluded for privacy			9.3	135	11.1
		Elementary School	Excluded for privacy			6.0	87	7.2
	Educational Use	Elementary School	Excluded for privacy			5.0	73	6.0
	Commercial Use	Plaza	Excluded for privacy			5.6	81	6.7
Whittier	Open Space and Recreation	Hellman Wilderness Park	5700 Greenleaf Ave.	34.0005	-118.0333	282.2	4104	338.6
		Palm Park	5703 Palm Ave.	33.9909	-118.0572	11.9	173	14.3
		Amigo Park	5700 Juarez Ave.	33.9993	-118.0691	3.9	56	4.6
		park	10559 Whittier Blvd.	33.9913	-118.0655	2.5	37	3.0

3.4.3 RIGHT-OF-WAY BMPS

Right-of-way BMPs are systems of multiple distributed BMPs placed within a street right-of-way. These BMPs are designed to reduce the volume of stormwater discharge into the MS4 and treat stormwater runoff from adjacent streets and developments. Common right-of-way BMPs include bioretention, biofiltration, and permeable pavement. See the previous section for BMP descriptions. These BMPs can be implemented alone or in conjunction with one another. A preliminary assessment has been performed to assess areas potentially available for right-of-way BMPs. This was done with a preliminary GIS approach by screening highways, arterial roads, and secondary (collector) roads located in non-residential areas within 200 feet of a catch basin location. The potential locations are indicated with grey circles on **Figure 3-23** below.

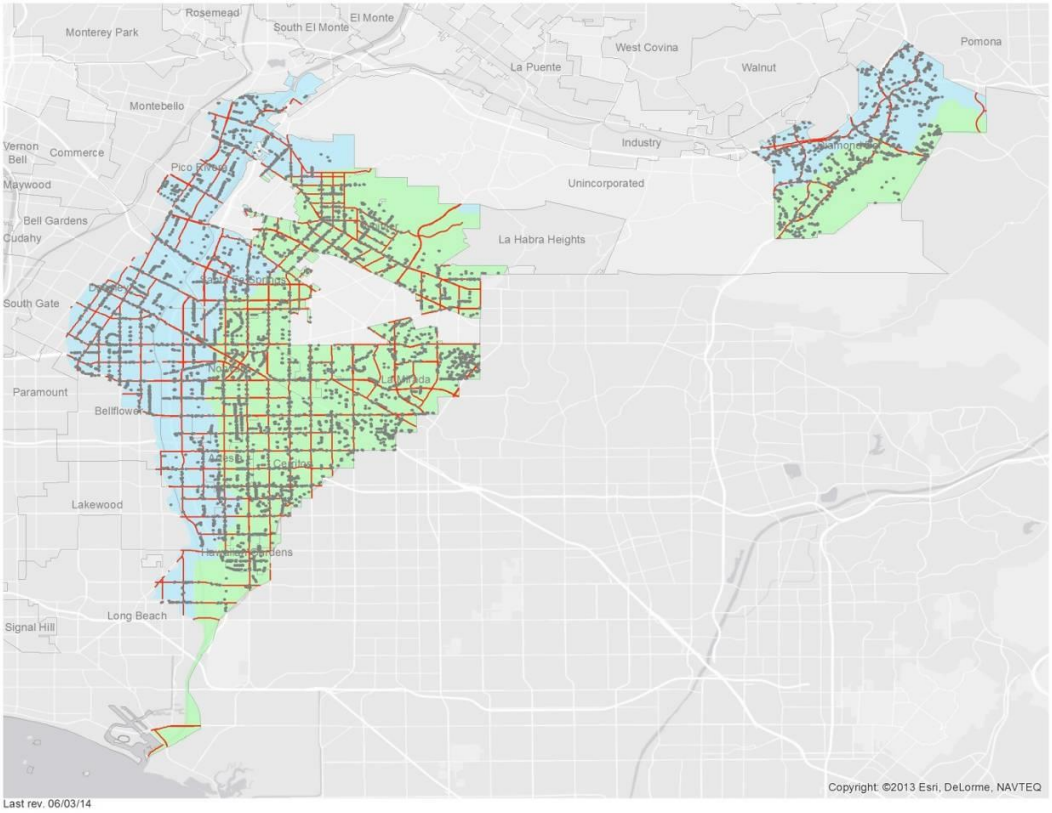


Figure 3-23: Areas potentially available for right-of-way BMPs

4 REASONABLE ASSURANCE ANALYSIS

4.1 EXECUTIVE SUMMARY

A required element the WMP is the Reasonable Assurance Analysis (RAA). The MS4 Permit specifies the RAA use a watershed based computer modeling system to demonstrate:

"that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term".

There are three computer modeling systems approved by the MS4 Permit and the Watershed Management Modeling System (WMMS) was selected to develop this RAA. The Los Angeles County Flood Control District (LACFCD), through a joint effort with U.S. Environmental Protection Agency (USEPA), developed WMMS specifically to support informed decisions associated with managing stormwater.

While the Permits prescribes the RAA as a quantitative demonstration that control measures will be effective, the RAA also promotes a modeling process to identify and prioritize potential control measures to be implemented by the WMP. In other words, the RAA not only demonstrates the cumulative effectiveness of BMPs to be implemented, it also supports their selection. Furthermore, the RAA incorporates the applicable compliance dates and milestones for attainment of the WQBELs and RWLs, and therefore supports BMP scheduling. The ultimate goal of WMMS is to identify cost-effective water quality improvement projects through an integrated, watershed-based approach.

On March 25, 2014, the Los Angeles Regional Water Quality Control Board (Regional Board) issued "RAA Guidelines" (LARWQCB 2014) to provide information and guidance to assist permittees in development of the RAA. Appendix 4-1 provides appropriate documentation on the modeling assumptions that meet the RAA Guidelines.

The RAA describes the process for identifying milestones the current and next Permit periods, as well as final milestones to meet applicable TMDLs. Modeling was performed to quantify necessary load reductions to achieve the milestones. Based on these load reduction targets, a pollutant reduction plan was established that outlines the types and sequencing of BMPs for each jurisdiction to achieve milestones throughout the schedule. The RAA provides a detailed list of the capacities needed for BMPs over time, incorporating the existing BMPs and control measures identified in the WMP. These recommendations serve as goals for each jurisdiction to seek opportunities for implementation over time, but strategies may change as opportunities for more cost-effective BMPs are identified throughout the schedule.

The RAA has determined that the metal zinc will be the primary or "limiting" pollutant and that by implementing the structural and non-structural measures in Chapter 3 to reduce zinc, the remaining pollutant goals will be achieved for the Water Quality Priorities defined in Chapter 2. The rationale for this modeling approach is included Section 5.3.1 of the RAA (Appendix 4-1).

4.2 REASONABLE ASSURANCE ANALYSIS

The Reasonable Assurance Analysis for the Lower San Gabriel River Watershed is included in Appendix 4-1. As data is collected through the monitoring program the model will be re-calibrated during the adaptive management process, which allow for improved simulation of physical processes such as flow volumes and volume retention BMPs.

4.2.1 IRRIGATION REDUCTION

There is sufficient information available to justify a 25% reduction in irrigation through specific controls.

- **"Landscape Water Conservation Programs: Evaluation of Water Budget Based Rate Structures" (1997).**[1] This study was prepared for The Metropolitan Water District of Southern California to evaluate the effects of customer outreach programs and adjustment of water-budget based rate structures on landscape water use. Communities that installed these water conservation programs saw landscape irrigation water use reduced 20-37%.
- **"The Residential Runoff Reduction Study" (2004).**[2] This study was produced for the Municipal Water District of Orange County to determine the effects of certain interventions on water savings. This study used a control or baseline site, an educational only site, and a retrofit site that installed weather-based controller technology and public education. The observed reduction at the retrofit site was 50% from pre- to post-intervention, and a reduction of 71% when comparing to the control group (which had no intervention). The education site also saw a reduction of 21% when compared to the control group.
- **"20x2020 Water Conservation Plan" (2010).**[3] This water conservation plan was prepared by a host of California agencies in response to the Californian Governor's Delta plan initiative that mandates California to have to achieve a 20 percent reduction per capita water use statewide by 2020. This study demonstrated that, for the South Coast specifically (which includes Greater Los Angeles, Long Beach and Orange County), potential conservation savings from current actions—basic measures, such as regulatory activities and reinforcing codes related to plumbing and appliance efficiency—are 3% per capita, or 6 gallons per capita per day (GPCD). Potential conservation savings for "cost effective measures" (such as BMPs and new technologies) are 7% per capita at 80% compliance (13 GPCD at 80% compliance and 17 GPCD at 100% compliance). Total "basic measure" savings are 24 GPCD. Baseline water use level for the South Coast region is 180 GPCD, which means with basic measures in place there is potential for 13.3% conservation savings. The study further demonstrates that with additional measures (such as residential weather-based irrigation controllers, landscape practices, recycled water, etc.) potential

[1] Pekelney, D., & Chestnutt, T. (1997). Landscape Water Conservation Programs: Evaluation of Water Budget Based Rate Structures. *The Metropolitan Water District of Southern California*. P vi of the Summary.

[2] The Municipal Water District of Orange County & The Irvine Ranch Water District. (2004). The Residential Runoff Reduction Study. *The Municipal Water District of Orange County.* P ES1 and ES6.

[3] California Department of Water Resources, State Water Resources Control Board, California Bay-Delta Authority, California Energy Commission, California Department of Public Health, California Public Utilities Commission, California Air Resources Board, California Urban Water Conservation Council, & U.S. Bureau of Reclamation. (2010). 20x2020 Water Conservation Plan.

conservation savings are 29 GPCD, or 16% for the South Coast Region. While this study evaluates the effects of interventions on a *per capita* basis, the results of this study have implications on water reductions and water savings for watersheds as a whole.

- **"Landscape Management for Water Savings" (1998).**[4] This study resulted in a "43% increase in landscape water efficiency (water savings) from 1990-1997" after instituting conservation pricing, financial incentives, and education programs for customers and landscape professionals. The author makes a strong conclusion that most irrigation systems need to be recalibrated to only provide the amount of water necessary for the plants within the landscape to grow. Furthermore, the author provides several specific cases that demonstrate that when water resources are mismanaged by outdated irrigation systems or uninformed landscape professionals, this wastes precious water resources and costs the landscape owners excess money.

In addition, on July 28, 2014, an emergency regulatory action went into effect in response to the ongoing drought conditions within California[5]. This emergency regulatory action prohibits: 1) The application of water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures; 2) The use of a hose to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or similar; and 3) The application of water to driveways and sidewalks. These mandatory regulations are expected to reduce landscape and water runoff.

The study results show a strong nexus between public education (leading to an increased awareness of water conservation and usage) and a reduction in irrigation use. The Participating Agencies will develop an outreach and education program focusing on water conservation and landscape water use efficiency.

Based on study results and the initiation of regulations aimed to reduce irrigation water use, a 25% reduction of irrigation water utilized in the RAA is considered reasonable and conservative.

As part of the adaptive management process the Participating Agencies will evaluate these assumptions during Program implementation and develop alternate controls if it becomes apparent that the assumption is not supported.

4.3 NON-MODELED CONTROLS

Currently there is insufficient information to accurately model the implementation of the controls listed in Section 3.2.3 through 3.4.1. These non-modeled controls were instead assigned a modest fraction of 10% for their cumulative load reduction. As part of the adaptive management process the Participating Agencies will evaluate this assumption during Program implementation and develop alternate controls if

[4] Ash, T. (1998). How to Profit from a Water Efficient Future. In *Landscape Management for Water Savings*. Tustin, CA: Municipal Water District of Orange County. P 8.

[5] Title 23, California Code of Regulations. Government Code Sections 11346.1 and 11349.6. OAL File No. 2014-0718-01 E.

it becomes apparent that the assumption is not supported. However, despite the uncertainty surrounding the specific load reductions for these controls, there is support to suggest that the assumption is in fact a modest one.

Chapter 3 provides qualitative assessments of potential pollutant reductions for new non-modeled, nonstructural and structural controls required by the 2012 MS4 Permit (Sections 3.2.4 and 3.3.1) as well as new non-modeled controls developed as part of this WMP (i.e., the "targeted" control measures of Section 3.4.1). The nonstructural measures are summarized in Tables 3-2 and 3-5. As explained in detail in Sections 3.2.4 and 3.3.1, the number and scope of the new and modified (i.e. enhanced) minimum provisions under the Permit is substantial. Of particular note are the Low Impact Development (LID) provisions—which replace prior SUSMP provisions—for new developments. Potential load reductions from future LID projects were not incorporated into the RAA and as such contribute to the 10% non-modeled assumption.

The Statewide Trash Amendments were recently approved. Compliance with the Trash Amendments is expected to result in trash load reductions as well as secondary organics reductions.

Also, pollutant reductions may be expected from continued, preexisting minimum controls with an educational component, such as public education, inspections of industrial/commercial and construction sites, and illicit discharge detection and elimination. Such programs can benefit from a continued increase in behavior change over time. Finally, the TSS Reduction Program—one of the non-modeled targeted control—does allow for a rough estimate of potential load reductions, as outlined in the following subsection.

4.3.1 TSS Reduction Program Quantification

Although expected pollutant reductions resulting from the TSS Reduction Strategy are not modeled empirically within WMMS, a simplified quantification of the program's potential effectiveness may be calculated through the application of the Revised Universal Soil Loss Equation (RUSLE). The RUSLE is defined as

$$A = RKLS$$

where

$A =$ Spatially and temporally averaged soil loss per unit area per unit time. The result is expressed in the units elected for K and R.
$R =$ Rainfall-runoff erosivity factor (per unit time, generally one year),
$K =$ Soil erodibility factor (mass per unit area – an area density – generally tons per acre),
$L =$ Slope length factor and
$S =$ Slope steepness factor.

Using local values of R, K and LS obtained through maps available on the State Water Resources Control Board's website for the Construction General Permit[6],

$$R \approx 40\ year^{-1}$$
$$K \approx 0.32\ \frac{tons}{acre}\ \text{and}$$
$$LS \approx 0.45$$

giving

$$A = (40\ year^{-1})\left(0.32\ \frac{tons}{acre}\right)0.45$$
$$A = 5.76\ \frac{tons}{acre\ year}.$$

Following the CGP Risk assessment procedures, 5.76 tons per acre year is within the "low sediment risk" designation.

During the preparation of this WMP, several participating agencies provided estimates of exposed soil within their jurisdiction that were not related to construction activities. The City of Bellflower field-verified these estimates, which totaled approximately 18 acres or about 0.5% of the City. Following the calculated value for A, this equates to approximately 100 tons of soil loss per year within the City.

Extrapolating this tonnage to the Lower SGR Watershed,

$$M_{TSS} = fWA = 0.005(50{,}240\ acres)\left(5.76\ \frac{tons}{acre\ year}\right)$$
$$M_{TSS} = 251\ acres\left(5.76\ \frac{tons}{acre\ year}\right)$$
$$M_{TSS} \approx 1{,}500\ \frac{tons}{year}$$

where

$M_{TSS} =$ Estimated annual soil loss within the LSGR watershed in tons,
$f =$ Estimated fraction of exposed soil (non-construction) within a given urbanized area and
$W =$ Watershed area.

Historical monitoring results from the adjacent Los Cerritos Watershed suggest that approximately 1.8 grams of zinc adheres to every kilogram of TSS, so that the zinc discharge M_{Zn} associated with M_{TSS} is

$$M_{Zn} \approx \left(\frac{1.8}{1000}\right)M_{TSS}$$
$$M_{Zn} \approx \left(\frac{1.8}{1000}\right)\left(1{,}500\ \frac{tons}{year}\right)\left(\frac{2000\ lbs}{1\ ton}\right)$$

[6] http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

$$M_{Zn} \approx 5{,}400\ \frac{lbs}{year}\ or\ 2{,}400\ \frac{kg}{year}.$$

The RAA predicts an annual zinc loading of 7,962 kg within the Lower SGR Watershed for the average storm year. Assuming that within the term of the MS4 Permits the TSS Reduction Strategy approaches an effectiveness goal of 10% (240 kg/year), this would equate to a load reduction of **3.0%**. Reductions of this magnitude provide support for the 10% load reduction assumed for non-modeled controls. Further development of the TSS Reduction program is anticipated to meaningfully aid in the achievement of targeted load reductions.

4.4 SYNCHRONY OF NON-MODELED AND MODELED CONTROLS

Although the Compliance Schedule Chapter indicates that a 10% reduction is sufficient for near-term pollutant reductions to achieve early interim milestones, it should be noted that the Group expects some targeted structural BMPs to be in place prior to these milestones. For example, implementation of the Prop 84 Grant is scheduled for completion in 2017. As such, the Group need not rely solely on the veracity of the 10% assumption to meet the interim milestones.

5 COMPLIANCE SCHEDULE

This Chapter provides the compliance schedule for each Participating Agency. The compliance schedule will be used to measure progress toward addressing the highest WQPs and achieving interim and final WQBELs and RWLs. Where deadlines are not specified within the MS4 Permit term, interim milestones are provided. The schedule is expressed as the needed structural BMP capacities over space and time. The Reasonable Assurance Analysis (RAA, Chapter 4) refines the capacity over space to the subwatershed level. The BMP capacities assume a 10% reduction over the MS4 Permit term through implementation of the nonstructural BMPs described in Chapter 3. The following section of this chapter includes the nonstructural BMP schedule.

Meeting the load reductions determined by the RAA results in an aggressive compliance schedule in terms of the technological, operational, and economic factors that affect the design, development, and implementation of the necessary control measures. Notably, as described in Chapter 6, there is currently no funding source to pay for these controls. Assuming finances are available, conversion of available land into a regional BMP is a protracted process that can take several years (not accounting acquisition, when required). As such the Group considers the compliance schedule to be as short as possible.

This is true for all WQPs—by the nature of the limiting pollutant approach, it is expected that each of the remaining WQPs will be controlled at a faster rate than zinc. So the aggressive schedule in place to target zinc provides an equally aggressive schedule to target the remaining WQPs, and as such it is considered to be as short as possible for all WQPs.

5.1 NONSTRUCTURAL BEST MANAGEMENT PRACTICES SCHEDULE

A 10% load reduction is assumed to result from the cumulative effect of nonstructural BMPs. These nonstructural BMPs consist of Minimum Control Measures, Non-stormwater Discharge Measures and Targeted Control Measures (MCMs, NSWD measures and TCMs) as described in Chapter 3.

5.1.1 NONSTRUCTURAL MINIMUM CONTROL MEASURES SCHEDULE

The MCMs will be implemented by the Participating Agencies upon approval of the WMP by the Regional Board Executive Officer or by the implementation dates provided in the MS4 Permit, where applicable. The scope of the MCM programs has expanded significantly from the prior third term MS4 Permit. This change is not entirely unexpected as a period of over ten years separates the adoption of the third and fourth term permits. Consequently significant pollutant reductions are anticipated through effective implementation of the new nonstructural MCMs. In particular, effective implementation of the Development Construction program will complement the nonstructural TSS Reduction Strategy.

MCM provisions new to the Cities are described in WMP Section 3.2. Guidance documents have been prepared as an optional aid to Cities in MCM development/implementation – see Attachment 3.1.

5.1.2 NONSTRUCTURAL NON STORMWATER DISCHARGE MEASURES SCHEDULE

The NSWD measures will be implemented by the Participating Agencies upon approval of the WMP by the Regional Board Executive Officer or by the implementation dates provided in the MS4 Permit, where applicable. The scope of the NSWD measures has expanded from the prior third term MS4 Permit. In particular, NSWD source investigations are now tied into a robust outfall screening program required by the MS4 Permit Monitoring and Reporting Program and additional conditions have been placed on common exempt NSWDs, such as potable water discharges and irrigation runoff. Consequently significant pollutant reductions are anticipated through the resulting reductions in NSWD flows.

NSWD measures new to the Participating Agencies are described in WMP Section 3.3.

5.1.3 NONSTRUCTURAL TARGETED CONTROL MEASURES SCHEDULE

The specific Participating Agencies implementing each TCM is included in Table 3-5 in Chapter 3. The table also lists whether the TCM is a *planned* or a *potential* control measure. Potential control measures are contingent upon unknown factors such as governing body approval and as such implementation within the MS4 Permit term cannot be guaranteed. Descriptions of each nonstructural TCM are included in WMP Section 3.4.

Uncertainties associated with the targeted nonstructural controls complicate establishment of specific implementation dates. Despite this uncertainty, the Group has made a diligent effort to provide a clear schedule of specific actions within the current and next permit terms in order to achieve target load reductions. In addition, the status of these controls will be included in the annual watershed reports as well as through the adaptive management process in order to assess their progress in attaining targeted load reductions. Table 5-1 lists the nonstructural TCM compliance schedule. See Section 3 for a jurisdictional progress report.

TSS REDUCTION STRATEGY

The expanded start-date ranges for the TSS Reduction Strategy (TCM-TSS-1 to 6) are set to accommodate the time needed to develop, adopt and implement model ordinances. A successfully implemented ordinance from the City of Whittier is included in this WMP as Appendix A-3-2. The remaining Cities will consider this ordinance as a template for their own TSS Reduction Strategy.

Complete implementation of this Program throughout the watershed is not expected by the end of the MS4 Permit term. However, as discussed in WMP Section 3.4, appreciable pollutant reductions may be realized with only partial implementation.

Table 5-1: Nonstructural TCM Compliance Schedule

Nonstructural TCM	Chapter 3	Effort	Status	Milestones
Prioritize facility inspections based on WQPs	TCM-ICF-1	J*	Started 7/1/2015, ongoing	Reprioritize facilities as new water
Enhance tracking through use of online GIS MS4 Permit database	TCM-MRP-1	J	Started 7/1/2015, ongoing	Modify database to reflect MS4 Permit provisions by
Statewide Trash Amendments (nonstructural measures)	TCM-PAA-3	J	Track selection November 2017	Estimated 10-15 year schedule.
Increased street sweeping frequency or routes	TCM-PAA-4	J	Started 7/1/2015, ongoing	Report on status with annual report submittal.
Apply for grant funding for stormwater quality projects	TCM-INI-4	W/J	Started 7/1/2014, ongoing	Suitable grants are pursued when practicable
Refocused outreach to target audiences and WQPs	TCM-PIP-1	W/J	Started 7/1/2015, ongoing	Report on status with annual report submittal
Train staff to facilitate LID and Green Streets implementation	TCM-PLD-1	J	Started 7/1/2014, ongoing	Complete first round by 7/1/2016. Continue periodic
LID ordinance for projects below MS4 Permit thresholds	TCM-PLD-2	J	Started 7/1/2014, ongoing	Adopt ordinance by 12/28/2017
Encourage retrofitting of downspouts	TCM-RET-1	J	Started 7/1/2015, ongoing	Develop educational material by 1/1/2016. Supply to builders/ contractors by 7/1/2016. Report on status
Prepare guidance documents to aid implementation of MCMs	TCM-SWM-1	W/J	Completed	Develop documents by 7/1/2015. Revise documents
Erosion repair and slope stabilization on private property	TCM-TSS-2	J	Started 7/1/2015, ongoing	Report on status with annual report submittal.
Private parking lot sweeping ordinance	TCM-TSS-3	J	Started 7/1/2015, ongoing	Adopt ordinance by 12/28/2016.
Sweeping of private roads and parking lots	TCM-TSS-4	J	Started 7/1/2015, ongoing	Enforce TCM-TSS-3 once adopted.
Erosion repair and slope stabilization on public property	TCM-TSS-6	J	Started 7/1/2015, ongoing	Report on status with annual report submittal.
Copper reduction through implementation of SB 346	TCM-INI-1	W*	Ongoing	Milestones are independent of participating agency actions.
Lead reduction through implementation of SB 757	TCM-INI-2	W	Ongoing	Milestones are independent of participating agency actions.
Support safer consumer product reg. for zinc reduction in tires	TCM-INI-3	W	Ongoing	Report on status with annual report submittal.
Incentives for irrigation reduction practices	TCM-NSW-1	J	Ongoing	Ongoing; no interim or final milestones.
Upgraded sweeping equipment	TCM-PAA-1	J	Ongoing	Report on status with annual report submittal.
(Sanitary) Sewer System Management Plan	TCM-PAA-2	J	Ongoing	Ongoing; no interim or final milestones.
Negotiate with utilities for erosion control within ROW	TCM-TSS-5	W	Ongoing	Report on status with annual report submittal.

*W – Watershed Group effort, J – Jurisdictional effort

5.2 RECENTLY COMPLETED PROJECT - PROPOSITION 84

The cities of Downey, Norwalk, Santa Fe Springs, and Whittier are participating in a regional multi-watershed project through the Gateway Water Management Authority (GWMA). This project applied for and was awarded funding though the Proposition 84 Grant. Initiation of this project began when the grant contracts and funding were finalized. The BMPs include: one (1) vegetated bioswale, eight (8) tree box filters, and ten (10) bioretention tree wells. Table 5-2 lists the responsible Permittees for each LID BMP in the Proposition 84 Grant project and Table 5-3 lists the deadlines and status for certain project milestones.

Table 5-2: Permittees Responsible for LID BMPs in the Proposition 84 Project

City	LID BMPs	Anticipated Treatment Volume[1]	Watersheds
Downey	(4) Tree box filters (1) Bioswale	29,032 cf 11,741 cf	San Gabriel River
Norwalk	(2) Tree box filters	14,516 cf	San Gabriel River
Santa Fe Springs	(2) Tree box filters	14,516 cf	San Gabriel River
Whittier	(10) Bioretention Tree Wells	5,870 cf	San Gabriel River

Table 5-3: Status for Prop 84 Tasks

Milestone	Date of Completion[2]	Status
CEQA	January 2015	Completed
Monitoring Plan, Project Plan and Assessment, and Quality Assurance Project Plan	March 2015	Completed
Preliminary Plans and Specifications	March 2015	Completed
Final Plans and Specifications	January 2015 – February 2017	Completed
Awarded Construction Contract	January 2015- January 2017	Completed
Construction and Implementation	(August 2015 for Whittier) February 2017 – May 2017	Completed
Operation and Maintenance Plan	February 2017	Completed
Monitoring and Reporting	January 2017 – April 2017	Completed
Project Completion	June 30, 2017	Completed

With the installation of these LID BMPs, this project is expected to reduce pollutant loads throughout the watershed. The full benefits of this project as it ties into interim and final compliance milestones will be

[1] Treatment volume calculations based on a 24-hour, 0.75-inch storm, 6x6 tree box filter units, and a 1200 LF swale. Additional details and calculations used to determine treatment volumes can be found in Attachment 6: Technical Report

[2] An amendment to extend the schedule by 3 months in the grant agreement was approved in November 2016.

determined during the adaptive management process. All BMPs were installed and other aspects of the project completed as of June 30, 2017. Project milestones and implementation timeframes are as follows:

Design, Environmental Documentation and Design and Bid Solicitation Process

The Project went through review to determine compliance with the environmental requirements such as those outlined in the California Environmental Quality Act (CEQA) in January 2015.

The Monitoring Plan, the Project Assessment and Evaluation Plan, and the Quality Assurance Project Plan were all submitted in March 2015 and approved. Preliminary site plans and specifications were developed and submitted in March 2015. Comments were received and addressed, and final plans and specifications were approved. Proposed BMP locations were on public property in the public right of way, therefore issues obtaining site access were not expected. However, several catch basins designated for connection to the tree box filters were owned and maintained by the LACFCD. This required each respective agencies to apply for Flood Control Permits. After an 18 month permit approval process, all locations were approved by March 2017.

During the Project design and bid process, a preliminary engineering analysis was performed for proposed designs and locations, preparation and review of design drawings and technical specifications. The Participating Agencies collaborated in reviewing the submitted proposals and construction documents. Once the review process was completed, construction contracts were awarded and finalized by the end of June 2016.

Construction and Implementation

The Project construction and implementation process included mobilization and site preparation, excavation and installation of BMPs and proper coordination with contractors. Construction was completed in August 2015 for the Whittier bioretention tree wells. The construction of the remaining projects were delayed because of the permit application process. Construction began in February 2017 once all BMP locations were finalized and permits were approved. During the excavation phase, some sites discovered utility lines despite underground alert efforts, requiring relocation and further prolonging construction. All construction was completed May 2017.

The Monitoring and Reporting Plan required specific BMPs to be evaluated for effectiveness in removing concentrations of copper, lead, and zinc during storm events. The results from the bioswale sampled from January – April 2017 showed significant reductions in copper, lead, and zinc concentrations. The results from the bioretention tree wells sampled in January 2017 also showed some reductions in metal concentrations. Operation and Maintenance Plans were developed for each BMP by late 2016.

Community event materials, survey results, and school outreach materials were developed in late 2016 and were distributed at a number of events in 2017. As a result of the education and outreach, there was a percentage increase in community awareness of stormwater pollution sources.

5.3 STRUCTURAL BEST MANAGEMENT PRACTICE SCHEDULE

Uncertainties associated with the structural controls complicate establishment of specific implementation dates. Despite this uncertainty the Group has made a diligent effort to provide a clear schedule of specific actions within the current and next permit terms in order to achieve target load reductions.

5.3.1 STRUCTURAL MINIMUM CONTROL MEASURES SCHEDULE

Significant pollutant reductions are anticipated through each City's effective implementation of the structural LID BMP requirements of the Planning and Land Development Program. These MCM provisions are described in WMP Section 3.2. Guidance documents have been prepared as an optional aid to Cities in MCM development/implementation – see Attachment 3.1. The Planning and Land Development Program will be implemented no later than June 28, 2014.

5.3.2 STRUCTURAL TARGETED CONTROL MEASURES SCHEDULE

The RAA (see Chapter 4) demonstrates the cumulative effectiveness of BMPs to be implemented, supports BMP selection, and provides volume reduction goals optimized across the entire watershed. The results are summarized for volume reduction (represented in acre-feet) for interim and final compliance milestones.

The plan depicted in the RAA is considered a potential initial scenario. Through the adaptive management process, the participating agencies may select different types of BMPs (e.g. increase implementation of green streets and reduce implementation of regional BMPs) or substitute alternative BMPs altogether (e.g., implement dry wells instead of green streets).

The wet weather volume reductions necessary for each milestone (10%, 35% and Final) for each City show the combined total estimated BMP volume (acre-feet) for right-of-way (ROW) BMPs and regional Low Impact Development (LID) BMPs on public or private parcels. Specific green streets projects were not investigated during this initial analysis for potential BMPs, therefore, the City-specific summary lists potential regional LID BMPs that *could* be used to achieve the required interim milestones and targets. Since this WMP is a planning-level document, over time the Watershed Group will report and demonstrate that the summative effect of projects implemented add up to the required reductions for interim milestones and final targets.

Dry weather reductions are attained through a combination of non-structural practices and structural BMPs as they are implemented as part of the wet weather attainment of limits. As wet-weather BMPs are implemented, they serve to remove the dry-weather flows thus meeting the compliance set forth to achieve dry-weather reductions.

APPROACH TO IMPLEMENTING STRUCTURAL CONTROLS

As expressed in the tables of Section 5.4, the Participating Agencies can meet the September 30, 2017, 10% milestone without structural controls. Despite this, the Group understands that targeting subsequent load reductions demands that the process of implementing structural controls begin as soon as possible. The initial phase of this process is as follows:

Right-of-Way BMPs (green street principles) - As the Participating Agencies prepare new capital improvement projects throughout their jurisdiction, a review to incorporate green street principles into the project will be done. Additionally, the Strategic Transportation Plan (STP), currently a draft document), prepared by the Gateway Water Management Authority, identifies major transportation corridors slated for significant redevelopment. The STP will require that structural stormwater BMPs be considered and incorporated into these projects where feasible. Implementation of the STP is expected to contribute to the achievement of the required metal reductions by the compliance deadlines.

Schedule: Every two years the adaptive management process will include an assessment of the effectiveness of both 1) right-of-way BMPs incorporated into CIP projects and 2) the STP in contributing toward targeted load reductions.

Regional BMPs - In each jurisdiction, potential Regional BMP locations have been identified and ranked. To maximize efficiency and resources, a feasibility study was developed to aid in selection of the most effective BMPs. The study provides criteria for selecting locations for regional BMPs, the process of ground-truthing to concretely determine feasibility, and a schedule that demonstrates implementation of regional BMPs. In conjunction with development of the feasibility study, each Participating Agency conducted a preliminary site assessment at the highest ranked potential BMP. The preliminary site assessment included reviewing available plans, and identifying nearby storm drain systems and drainage areas. Information that was acquired during the preliminary assessment which suggested the selected potential BMP to be infeasible, resulted in additional high ranked potential BMPs in that jurisdiction being explored. Each Participating Agency conducted sufficient preliminary site determinations to select a location sufficient for further exploration. Selected sites were chosen for additional exploration to include field analysis.

Schedule: The preliminary site assessments and feasibility study were completed July 2015. Field analysis at selected sites began in November 2016

Even though not all projects can be specified and scheduled at this time, the Participating Agencies are committed to constructing the necessary regional and right-of-way BMPs to meet the determined load reductions per applicable compliance schedules. Through implementation of the WMP and adaptive management there is the potential for the final compliance milestones to change.

Furthermore, the LACFCD will work with the Watershed group in their efforts to address source controls; assess, develop, and pursue funding for structural BMPs, and promote the use of water reuse and

infiltration. As regional project scopes are further refined, the LACFCD will contribute to the WMP projects on a case-by-case basis, agreed upon with the Watershed Group.

5.4 POLLUTANT REDUCTION PLAN TO ATTAIN INTERIM & FINAL LIMITS

The following pages describe the pollutant reduction plans for each City for drainage areas within both the San Gabriel River and Coyote Creek. Figure 5-1 is an illustration of the total structural BMP capacity needed to comply with final WQBELs/RWLs within the Lower SGR Watershed.

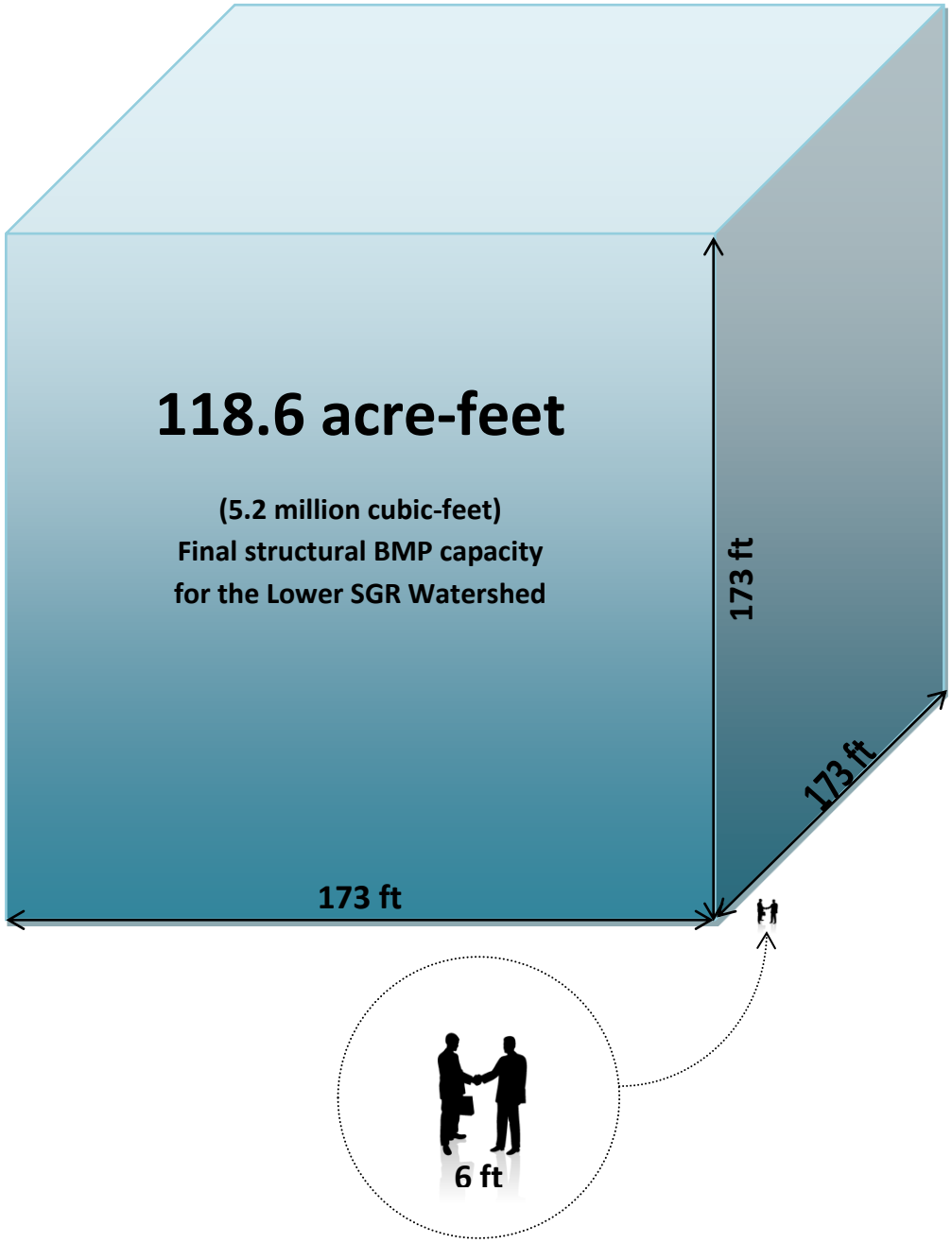


Figure 5-1: The Compliance Cube (total required BMP capacity for the Lower SGR Watershed)

5.4.1 CITY OF ARTESIA

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Artesia	10%	NS*	NS*
	35%	0.1	0.1
	Final	---	0.1

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Artesia within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 0.1 acre-feet by September 30, 2020 to meet the 35% interim milestone, which is equivalent to the final compliance milestone by September 30, 2026.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the remaining 0.1 acre-feet could be addressed using Right-of-Way BMPs to meet the 35% interim milestone and final compliance milestone.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Artesia	10%	NS*	NS*
	35%	1.1	1.1
	Final	0.0	1.1

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Artesia within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 1.1 acre-feet by September 30, 2020 to meet the 35% interim milestone, which is equivalent to the final compliance milestone.

If Padelford Park or an equivalent open space was transformed into an infiltration BMP, the potential capture volume would be 1.6 acre-feet, which would be sufficient to meet the 35% interim compliance and the final compliance. Additionally, the 1.1 acre-feet needed to meet the 35% interim milestone and final compliance milestone could be addressed using Right-of-Way BMPs.

5.4.2 CITY OF BELLFLOWER

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN*	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Bellflower	10%	NS**	NS**
	35%	0.2	0.2
	Final	5.2	5.5

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.

** Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Bellflower within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 0.2 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 5.5 acre-feet by September 30, 2026 for the final compliance milestone.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the 0.2 acre-feet needed to meet the 35% interim milestone could be addressed using Right-of-Way BMPs. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Caruthers Park and Thompson Park. Percolation tests were conducted at Caruthers Park and Thompson Park. Caruthers Park has the potential capacity for a 9 acre-feet infiltration vault receiving runoff from approximately 1,500 acres of adjacent drainage area. The City of Bellflower received a Caltrans grant of $13 M for Caruthers Park.

5.4.3 CITY OF CERRITOS

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Cerritos	10%	NS*	NS*
	35%	0.0	0.0
	Final	0.6	0.6

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Cerritos within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 0.6 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. Additionally, Right-of-Way BMPs to meet the final compliance milestone will be explored.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN*	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Cerritos	10%	NS**	NS**
	35%	0.0	0.0
	Final	6.4	6.5

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.

** Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Cerritos within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 6.5 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Cerritos Regional Park. Percolation testing is currently underway at Cerritos Regional Park.

5.4.4 CITY OF DIAMOND BAR

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Diamond Bar	10%	NS*	NS*
	35%	0.0	0.0
	Final	0.2	0.2

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Diamond Bar within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 0.2 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. Additionally, Right-of-Way BMPs to meet the final compliance milestone will be explored.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN* Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Diamond Bar	10%	NS**	NS**
	35%	0.3	0.3
	Final	8.7	8.9

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.

** Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Diamond within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 0.3 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 8.9 acre-feet by September 30, 2026 for the final compliance milestone.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the 0.3 acre-feet needed to meet the 35% interim milestone could be addressed using Right-of-Way BMPs. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Cerritos Regional Park.

5.4.5 CITY OF DOWNEY

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Downey	10%	NS*	NS*
	35%	0.0	0.0
	Final	10.4**	10.4**

* Nonstructural practices achieve 10% milestone

**Value attained after the city's existing distributed BMP volumes totaling 7.1 acre-ft were incorporated

According to the RAA results, the areas of the city of Downey within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 10.4 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Wilderness Park and Independence Park. Independence Park has the potential capacity for a 7.73 acre-feet infiltration vault.

5.4.6 CITY OF HAWAIIAN GARDENS

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN* Total Estimated BMP Volume (acre-feet)	
		Incremental	Cumulative
Hawaiian Gardens	10%	NS**	NS**
	35%	1.8	1.8
	Final	0.3	2.2

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.

** Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Hawaiian Gardens within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 1.8 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 2.2 acre-feet by September 30, 2026 for the final compliance milestone.

Since the available area in Hawaiian Gardens consists mostly of educational use, the 1.8 acre-feet needed to meet the 35% interim milestone and 0.3 acre-feet needed to meet the final compliance milestone could be addressed using Right-of-Way BMPs.

5.4.7 CITY OF LA MIRADA

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)	
		Incremental	Cumulative
La Mirada	10%	NS*	NS*
	35%	0.0	0.0
	Final	15.2	15.2

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of La Mirada within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 15.2 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Cerritos Regional Park.

5.4.8 CITY OF LAKEWOOD

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Lakewood	10%	NS*	NS*
	35%	0.0	0.0
	Final	0.3	0.3

* Non-structural practices achieve 10% milestone

According to the RAA results, the areas of the city of Lakewood within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 0.3 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. Additionally, Right-of-Way BMPs to meet the final compliance milestone will be explored.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN*	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Lakewood	10%	NS**	NS**
	35%	1.6	1.6
	Final	0.3	1.8

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.

** Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Lakewood within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 1.6 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 1.8 acre-feet by September 30, 2026 for the final compliance milestone.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the 1.6 acre-feet needed to meet the 35% interim milestone and 0.3 acre-feet needed to meet the final compliance milestone could be addressed using Right-of-Way BMPs.

5.4.9 CITY OF LONG BEACH

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Long Beach	10%	NS*	NS*
	35%	2.4	2.4
	Final	0.3	2.7

* Non-structural practices achieve 10% milestone

According to the RAA results, the areas of the city of Long Beach within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 2.4 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 2.7 acre-feet by September 30, 2026 for the final compliance milestone.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the 2.4 acre-feet needed to meet the 35% interim milestone could be addressed using Right-of-Way BMPs.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Long Beach	10%	NS*	NS*
	35%	0.0	0.0
	Final	0.0	0.0

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Long Beach within the Coyote Creek Watershed will not need to capture to capture and/or treat stormwater in order to meet the compliance milestones. The suggested approach for these areas is to implement the targeted nonstructural source control BMPs along with all required MCMs until further information is gathered from the adaptive management process.

5.4.10 CITY OF NORWALK

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN*	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Norwalk	10%	NS**	NS**
	35%	0.1	0.1
	Final	0.3	0.3

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.
** Non-structural practices achieve 10% milestone

According to the RAA results, the areas of the city of Norwalk within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 0.1 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 0.3 acre-feet by September 30, 2026 for the final compliance milestone.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the 0.1 acre-feet needed to meet the 35% interim milestone and 0.3 acre-feet needed to meet the final compliance milestone could be addressed using Right-of-Way BMPs. Potential regional BMPs will be explored, such as the Hoxie Avenue project, which has a potential capacity for a 0.41 acre-feet infiltration vault.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Norwalk	10%	NS*	NS*
	35%	0.2	0.2
	Final	4.6	4.8

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Norwalk within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% interim milestone; however, the city will need to capture 0.2 acre-feet by September 30, 2020 to meet the 35% interim milestone, and total of 4.8 acre-feet by September 30, 2026 for the final compliance milestone.

Since many of the open space areas identified as potential locations for regional BMPs would provide a treatment volume much larger than the compliance volume, the 0.2 acre-feet needed to meet the 35% interim milestone could be addressed using Right-of-Way BMPs. Potential regional BMPs will be explored, such as Hermosillo Park, which has the potential capacity for an 8 acre-feet infiltration vault.

5.4.11 CITY OF PICO RIVERA

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN* Total Estimated BMP Volume (acre-ft) Incremental	Cumulative
Pico Rivera	10%	NS**	NS**
	35%	0.0	0.0
	Final	10.7	10.8

* Values taken directly from RAA. Differences between the sum of the incremental reduction volumes and the cumulative reduction volumes are attributed to rounding errors of the second decimal place.
** Non-structural practices achieve 10% milestone

According to the RAA results, the areas of the city of Pico Rivera within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 10.8 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Caruthers Park.

5.4.12 CITY OF SANTA FE SPRINGS

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Santa Fe Springs	10%	NS*	NS*
	35%	0.0	0.0
	Final	4.9	4.9

* Non-structural practices achieve 10% milestone

According to the RAA results, the areas of the city of Santa Fe Springs within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 4.9 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Caruthers Park.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Santa Fe Springs	10%	NS*	NS*
	35%	0.0	0.0
	Final	2.1	2.1

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Santa Fe Springs within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 2.1 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. Additionally, Right-of-Way BMPs to meet the final compliance milestone will be explored.

5.4.13 CITY OF WHITTIER

SAN GABRIEL RIVER

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Whittier	10%	NS*	NS*
	35%	0.0	0.0
	Final	1.4	1.4

* Non-structural practices achieve 10% milestone

According to the RAA results, the areas of the city of Whittier within the San Gabriel River Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 1.4 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. Additionally, Right-of-Way BMPs to meet the final compliance milestone will be explored.

COYOTE CREEK

Jurisdiction	Milestone	POLLUTANT REDUCTION PLAN	
		Total Estimated BMP Volume (acre-ft)	
		Incremental	Cumulative
Whittier	10%	NS*	NS*
	35%	0.0	0.0
	Final	39	39

* Nonstructural practices achieve 10% milestone

According to the RAA results, the areas of the city of Whittier within the Coyote Creek Watershed will not need to capture and/or treat stormwater in order to meet the September 30, 2017 10% or September 30, 2020 35% interim milestone; however, the city will need to capture 39 acre-feet by September 30, 2026 to meet the final compliance milestone. Potential regional BMPs for the final compliance milestone will be explored as described in Section 3. This includes potential projects such as Cerritos Regional Park

5.4.14 THE STATE OF BACTERIA

As anticipated, the TMDL for Indicator Bacteria in the San Gabriel River, Estuary and Tributaries was adopted for the LSGR watershed on June 10, 2015. The Bacteria TMDL dry weather deadline is 2026 and the wet weather deadline is 2036, which extends beyond the 2026 deadline for the limiting pollutant zinc. The WMP RAA currently predicts that control measures listed in the WMP to achieve metals TMDL limits will address bacteria limits as well. However, the 2015-2016 CIMP results for metals may be an indication that more progress has been made toward achieving Metals TMDL limits than assumed in the RAA. If trends continue, planned control measures in the WMP to achieve metals TMDL limits may be reconsidered to focus on Bacteria TMDL limits. At this early point in implementation – analysis of long term trends is limited, and as such there is insufficient justification for reconsidering the LSGR watershed's limiting pollutant.

5.5 ESTIMATED COSTS OF STRUCTURAL BMPS

Future costs associated with regional and Right-of-Way BMPs were estimated by using costs associated with an existing regional project (Discovery Park) and estimated costs for potential regional projects. Potential regional project costs were obtained from Los Angeles County.[3] Table 5-4 includes the estimated total costs and cost per acre-foot for regional and Right-of-Way BMPs.

The cost estimates only represent permitting, material, construction, and operation and maintenance (O&M) cost - with the exception of Discovery Park which does not take into account O&M costs. The cost of land acquisition, which is estimated to be over $5,000,000 per acre, was not included since initial regional and Right-of-Way BMP projects are planned for public lands. Because of the preliminary nature of the projects, the estimates developed for the proposed BMPs on public property lie between the preliminary/order of magnitude and budget level estimates, with an expected accuracy of about minus 25 percent to plus 40 percent.[4]

Table 5-4: Existing or potential estimated structural BMP cost

Project Name	Total Estimated Cost	BMP Capacity (acre-feet)	Cost Per Acre Foot
Bethune Park	$570,000	0.9	$1,000,000
Enterprise Park	$1,240,000	3.9	$318,000
Reid Park	$1,400,000	0.6	$2,333,000
Belvedere Park	$3,700,000	13.8	$268,000
Discovery Park	$4,500,000 *	8.0	$562,500
Johnson Park	$5,060,000	20.0	$253,000
Charles White Park	$5,300,000	21.0	$252,380
Right-of Way BMPs**	-------	0.25	$250,000

* Cost does not include O&M.

* A specific project was not used for the cost estimate. Instead various projects were averaged.

[3] Multi-Pollutant TMDL Implementation for the Unincorporated County Area of Los Angeles River: Part 2

[4] Multi-Pollutant TMDL Implementation for the Unincorporated County Area of Los Angeles River: Part 2

Cost were derived by assuming approximately two thirds of the projects implemented will be regional, with the remaining being Right-of-Way projects. Using general assumptions for the projects above, the following costs are anticipated:

- A cost of $2,000,000 per acre foot is anticipated for projects treating less than 1 acre-foot
- A cost of $625,000 per acre foot is anticipated for projects treating between 1 and 10 acre-feet
- A cost of $260,000 per acre foot is anticipated for projects treating more than 10 acre-feet

5.5.1 TOTAL ESTIMATED COSTS OF STRUCTURAL BMPS

The following tables include the total estimated costs of structural BMPs for each City.

CITY OF ARTESIA STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet) Incremental	Cumulative	Total Estimated Cost
San Gabriel River	10%	NS	NS	$450,000 - $840,000
	35%	0.1	0.1	
	Final	---	0.1	
Coyote Creek	10%	NS	NS	
	35%	1.1	1.1	
	Final	---	1.1	

CITY OF BELLFLOWER STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet) Incremental	Cumulative	Total Estimated Cost
San Gabriel River	10%	NS	NS	$2,100,000 - $3,850,000
	35%	0.2	0.2	
	Final	5.2	5.5	

CITY OF CERRITOS STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet) Incremental	Cumulative	Total Estimated Cost
San Gabriel River	10%	NS	NS	$2,700,000 - $5,000,000
	35%	0.0	0.0	
	Final	0.6	0.6	
Coyote Creek	10%	NS	NS	
	35%	0.0	0.0	
	Final	6.4	6.5	

CITY OF DIAMOND BAR STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$3,400,000 - $6,400,000
	35%	0.0	0.0	
	Final	0.2	0.2	
Coyote Creek	10%	NS	NS	
	35%	0.3	0.3	
	Final	8.7	8.9	

CITY OF DOWNEY STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$3,900,000 - $7,300,000
	35%	0.0	0.0	
	Final	10.4	10.4	

CITY OF HAWAIIAN GARDENS STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
Coyote Creek	10%	NS	NS	$825,000 - $1,540,000
	35%	1.8	1.8	
	Final	0.3	2.2	

CITY OF LA MIRADA STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
Coyote Creek	10%	NS	NS	$3,000,000 - 5,500,000
	35%	0.0	0.0	
	Final	15.2	15.2	

CITY OF LAKEWOOD STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$790,000 - $1,500,000
	35%	0.0	0.0	
	Final	0.3	0.3	
Coyote Creek	10%	NS	NS	
	35%	1.6	1.6	
	Final	0.3	1.8	

CITY OF LONG BEACH STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$1,015,500 - $1,900,000
	35%	2.4	2.4	
	Final	0.3	2.7	
Coyote Creek	10%	NS	NS	
	35%	0.0	0.0	
	Final	0.0	0.0	

CITY OF NORWALK STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$1,900,000 - $3,600,000
	35%	0.1	0.1	
	Final	0.3	0.3	
Coyote Creek	10%	NS	NS	
	35%	0.2	0.2	
	Final	4.6	4.8	

CITY OF PICO RIVERA STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$4,050,000 - $7,600,000
	35%	0.0	0.0	
	Final	10.7	10.8	

CITY OF SANTA FE SPRINGS STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$2,600,000 - $4,900,000
	35%	0.0	0.0	
	Final	4.9	4.9	
Coyote Creek	10%	NS	NS	
	35%	0.0	0.0	
	Final	2.1	2.1	

CITY OF WHITTIER STRUCTURAL BMP COST ESTIMATE

Watershed	Milestone	POLLUTANT REDUCTION PLAN Total Estimated BMP Volume (acre-feet)		Total Estimated Cost
		Incremental	Cumulative	
San Gabriel River	10%	NS	NS	$7,900,000 - $14,700,000
	35%	0.0	0.0	
	Final	1.4	1.4	
Coyote Creek	10%	NS	NS	
	35%	0.0	0.0	
	Final	39	39	

6 FINANCIAL STRATEGY

This section outlines the financial strategy to implement the Lower SGR WMP in accordance with the MS4 Permit. The cost estimates provided herein are preliminary and based on the best available information to date. The estimates are also subject to revision as new information becomes available, including as the Watershed Control Measures (WCMs) are refined over the implementation period.

Financing the implementation of the Lower SGR WMP is the greatest challenge confronting the Watershed Group. In the absence of stormwater utility fees, the Participating Agencies have no dedicated revenue stream to pay for implementation of the WMP. In addition to current uncertainties associated with costs and funding, there are multiple uncertainties associated with future risks. The first TMDL compliance dates for the Lower SGR Watershed Group will be the interim metals milestones of 2017, 2020, and the final compliance date of September 30, 2026. Thus, there will be many deadlines that must be met despite limited resources. Member Agencies will need to set priorities and seek funding in order to meet the various compliance deadlines.

Therefore, to address the Lower SGR Water Quality Priorities (WQPs), the Watershed Group is going to pursue a multi-faceted financial strategy to match the multi-faceted Strategy for the Selection and Implementation of WCMs outlined in Chapter 3. In addition, the Watershed Group has coordinated the proposed compliance schedule (see Section 5) with the financial strategy.

The latest Los Angeles and Long Beach MS4 permits have greatly magnified the cost challenges associated with managing stormwater. The absence of a stable stormwater funding mechanism not tied to municipal General Funds is becoming ever more critical. For that reason, the City Manager Committees of the California Contract Cities Association and the League of California Cities, Los Angeles Division, formed a City Managers' Working Group (Working Group) to review stormwater funding options after the LA County proposed Clean Water, Clean Beaches funding initiative failed to move forward. The result was a Stormwater Funding Report that notes, "the Los Angeles region faces critical, very costly, and seriously underfunded stormwater and urban runoff water quality challenges." The Report found that funding stormwater programs is so complex and dynamic, and the water quality improvement measures so costly, that Permittees cannot depend on a single funding option at this time. The City Managers' report includes a variety of recommendations, including: organizational recommendations; education and outreach program recommendations; recommendations for legislation; Clean Water, Clean Beaches recommendations; local funding options; and recommendations for the Regional Water Board[1].

The Watershed Group has considered the recommendations in the Stormwater Funding Report in developing this financial strategy. A critical component of the report is the observation that moving forward with a regional stormwater fee vote (like the LA County Clean Water, Clean Beaches funding

[1]League of California Cities. (2014). Providing Sustainable Water Quality Funding in Los Angeles County. Prepared By City Managers Working Group. Los Angeles County Division May 21, 2014.

initiative) would likely not occur until after June 2015, which means that the first funds would likely not be available until property tax payments are received in 2017. Assuming revenues of approximately $6 million per year available from a funding source based on the proposed Clean Water, Clean Beaches funding initiative, the Watershed Group could expect approximately $60 million to be available over 10 years[2]. However, these amounts may not be sufficient to pay for and maintain expensive stormwater capture and dry-weather low flow diversions to the sanitary sewer if the Watershed Group had to depend on such projects to come into compliance with receiving water limitations (RWLs) and water quality-based effluent limitations (WQBELs) specified in the MS4 Permit.

The Reasonable Assurance Analysis (RAA) for the Lower SGR WMP, indicate that the volume of water required to be captured within the Watershed to comply with RWLs and WQBELs is 118.6 AF.

For cost estimation purposes, this WMP initially assumes that the Lower SGR Watershed could ultimately require the capacity to capture and infiltrate or use 118.6 AF of water. Based on cost estimates for constructing regional and Right-of-Way BMPs, as discussed in Section 5.5, such a requirement could cost the watershed between $34 million and $65 million for construction of these facilities (refer to Section 5.5 for more a detailed cost analysis).

The Watershed Group has been involved in the development of the financial strategy recommendations, and proposes to consider the recommendations of the City Managers Working Group to develop long-term solutions to stormwater quality funding. In the meantime, the Watershed Group will focus on the local funding options presented in the Stormwater Funding Report to secure the needed funding for initial implementation of the WMP.

During the early years of implementation, the Permittees anticipate having to depend largely on local fees such as commercial/industrial inspection fees, General Fund expenditures, and, potentially, Clean Water State Revolving Fund program financing agreements to fund the implementation of the WCMs. The Watershed Group will seek opportunities to leverage the limited funds available. It will do this by financially supporting the efforts of others, such as the California Stormwater Quality Association (CASQA), to seek State approval of true source control measures such as implementation of the Safer Consumer Product Regulations adopted by the Department of Toxic Substances Control in 2013. The Group will also support programs to increase water conservation, reduce dry-weather discharges to the storm drain system, and reduce TSS during wet weather. Successfully accomplishing these efforts could reduce the money needed in the long term to capture and/or treat stormwater discharges to comply with TMDLs and address other WQPs.

Concurrently, the Watershed Group proposes to work with the California Contract Cities, the Los Angeles Division of the League of California Cities, and others to educate elected officials and voters about the

[2] Based on numbers derived for Los Cerritos Channel (LCC) during the development of the LCC WMP using expected annual revenue from a pro rata distribution of funds allocated to the Cities in the LCC Watershed and a possible proportional allocation of funds from the Watershed Authority Groups.

water quality problems facing the region and the need to develop an equitable financing mechanism to fund the programs and facilities necessary to come into compliance with water quality regulations.

Legislative solutions will be necessary to clarify the application of Proposition 218 to fees for the capture and use of stormwater in light of a recent 6th Appellate Court decision and to ensure that any State water bond put on the ballot in fall 2014 contains funding for stormwater quality projects. The Group will also support local and statewide efforts to amend Proposition 218 to have stormwater fees treated in the same manner as water, sewage, and refuse fees. The Watershed Group and/or the Participating Agencies will also seek grants to implement rainwater capture and reuse or capture and infiltrate projects on publicly owned property.

In the long term, financing the WCMs for the Lower SGR Watershed will require establishing dependable revenue streams for local water quality programs. Accomplishing this formidable task will require the cooperation of many entities, including business and environmental organizations and the Regional Board.

7 LEGAL AUTHORITY

MS4 Permit §VI.C.5.b.iv.6 (LA)/ §VII.C.5.h.vi (LB)

This section covers information such as documentation and references/links to water quality ordinances for each participating that demonstrates adequate legal authority to implement and enforce Watershed Control Measures (WCMs) identified in this plan and as required in Section VI.D.5.b.iv.6 of the MS4 Permit. The goal of these WCMs is to create an efficient program that focuses on the watershed priorities by meeting the following objectives:

- Prevent or eliminate non-storm water discharges to the MS4 that are a source of pollutants from the MS4 to receiving waters.
- Implement pollutant controls necessary to achieve all applicable interim and final water quality-based effluent limitations and/or receiving water limitations pursuant to corresponding compliance schedules.
- Ensure that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations.

The WCMs include the minimum control measures, nonstormwater discharge measures and targeted control measures (i.e. controls to address TMDL and 303(d) listings). As the requirement to incorporate these WCMs is an element of the MS4 Permits, the legal authority to implement them results from each agency's legal authority to implement the NPDES MS4 Permit.

A copy of each participating agency's legal authority certification from their chief legal counsel can be found in Appendix A-7. This certification shall be prepared annually. Table 7-1 includes the section that covers water quality ordinance for each agency with a reference link.

Table 7-1 Water quality ordinance language

City	Water Quality Ordinance	Reference
Artesia	Title 6-Sanitation and Health, Chapter 7, Storm Water Management and Discharge Control	http://qcode.us/codes/artesia/
6.7.02 Purpose and Intent (b) -*The intent of this chapter is to protect and enhance the quality of watercourses, water bodies, and wetlands within the City in a manner consistent with the Federal Clean Water Act, the California Porter-Cologne Water Quality Act and the Municipal NPDES Permit.* *(c) This chapter is also intended to provide the City with the legal authority necessary to control discharges to and from those portions of the municipal separate storm sewer system over which it has jurisdiction as required by the Municipal NPDES Permit, and thereby fully and timely comply with the terms of the Municipal NPDES Permits while the CSWMP and the WMAP are being developed by the permittees under the Municipal NPDES Permit, and in contemplation of the subsequent amendment of this chapter or adoption by the City of additional provisions of this chapter to implement the subsequent adopted CSWMP and WMAP, or other programs developed under the Municipal NPDES Permit.*		
Bellflower	Title 13-Public Services, Chapter 13.20, Stormwater and Runoff Pollution Control	http://qcode.us/codes/bellflower
13.20.030 Purpose and Intent (B)- *The intent of this chapter is to enhance and protect the water quality of the receiving waters of the United States in a manner that is consistent with the Clean Water Act and*		

acts amendatory thereof or supplementary thereto, to applicable implementing regulations and the municipal NPDES permit and any amendment, revision, or re-issuance thereof.		
Cerritos	Title 6- Health and Sanitation, Chapter 6.32, Stormwater and Urban Runoff Pollution Prevention Controls	http://www.codepublishing.com/ca/cerritos.html
6.32.010 Purpose (C) - *Reducing pollutants in storm water and urban runoff to the maximum extent practicable. (Ord. 777 § 1 (part), 1997)*		
Diamond Bar	Title 8- Health and Safety, Chapter 8.12, Division 5, Stormwater and Urban Runoff Pollution Control	http://library.municode.com/index.aspx?clientId=12790
Sec. 8.12.1630 Purpose and Intent (b) - *The intent of this division is to protect and enhance the quality of watercourses, water bodies, and wetlands within the city in a manner consistent with the Federal Clean Water Act, the California Porter-Cologne Water Quality Control Act and the municipal NPDES permit.* *(c) This division is also intended to provide the city with the legal authority necessary to control discharges to and from those portions of the municipal storm water system over which it has jurisdiction as required by the municipal NPDES permit and to hold dischargers to the municipal storm water system accountable for their contributions of pollutants and flows.*		
Downey	Article V- Sanitation, Chapter 7, Stormwater and Urban Runoff Pollution and Conveyance Controls	http://qcode.us/codes/downey/
Section 5701. Watershed Management Program - *Notwithstanding other provisions in the Downey Municipal Codes, the MS4 Permit requires the City of Downey to implement the Watershed Management Program (WMP), and any subsequent amendments, are hereby incorporated into this Ordinance by reference. (Added by Ord. 1142, adopted 02-11-03; amended by Ord. 1320, adopted 11-12-13).*		
Hawaiian Gardens	Title 6- Health and Safety, Chapter 6.47, Urban Storm Water Runoff Control	http://qcode.us/codes/hawaiiangardens/
6.47.020 Purpose and Intent (D) - *Reducing pollutants in storm water and urban runoff to the maximum extent practicable in order to achieve water quality standards/receiving water limitations. (Ord. 549 § 1, 2013; Ord. 476 § 1, 2002)*		
La Mirada	Title 13- Water and Sewage, Chapter 13.12, Urban Runoff	http://www.amlegal.com/library/ca/lamirada.shtml
13.12.020 Purpose and Intent (c) - *Reducing pollutants in stormwater and urban runoff to the maximum extent practicable.*		
Lakewood	Article 05 (V) - Sanitation-Health, Chapter 8, Stormwater and Urban Runoff Pollution Control	http://weblink.lakewoodcity.org/weblink8/
5800 - Adoption of the Los Angeles County Stormwater Runoff Pollution Control Ordinance - *Except as otherwise provided in this Chapter, the stormwater runoff pollution control ordinance of the County of Los Angeles contained in Chapter 12.80 of Title 12- Environmental Protection of the Los Angeles County Code relating to control of pollutants carried by stormwater and runoff adopted by the County of Los Angeles on June 9, 1998, is hereby adopted and made a part hereof as though set forth in full. The same shall hereafter constitute the Stormwater and Runoff Pollution Control Ordinance of the City of Lakewood relating to the control of pollutants carried by stormwater and runoff and discharging into receiving water of the United States.*		
Long Beach	Volume II-Title 18-Building and Construction, Chapter 18.61, NPDES and SUSMP Regulations	http://library.municode.com/index.aspx?clientId=16115
18.61.010 Purpose - *The purpose of this chapter is to provide regulations and give legal effect to certain requirements of the National Pollutant Discharge Elimination System (NPDES) permit issued to the City of Long Beach, and the subsequent requirements of the Standard Urban Storm Water Mitigation Plan (SUMSP), mandated by the California Regional Water Quality Control Board, Los Angeles Region*		

(RWQCB). The intent of these regulations is to effectively prohibit non-storm water discharges into the storm drain systems or receiving waters and to require source control BMP to prevent or reduce the discharge of pollutants into storm water to the maximum extent practicable. *The City of Long Beach is a participant member of this watershed group but is under a different MS4 Permit. Certification of legal authority will be in accordance with its MS4 Permit timeline*		
LACFCD	Flood Control District Code, Chapter 21 - Stormwater and Runoff Pollution Control	https://library.municode.com/index.aspx?clientId=16274
21.01 - Purpose and Intent - *The purpose and intent of this chapter is to regulate the stormwater and non-stormwater discharges to the facilities of the Los Angeles County Flood Control District for the protection of those facilities, the water quality of the waters in and downstream of those facilities, and the quality of the water that is being stored in water-bearing zones underground.*		
Norwalk	Title 18 - Environment, Chapter 18.04, Stormwater and Urban Runoff Pollution Control	http://qcode.us/codes/norwalk/
18.04.030 Purpose and Intent (C)- *This chapter is also intended to provide the City with the legal authority necessary to control discharges to and from those portions of the municipal stormwater system over which it has jurisdiction as required by the municipal NPDES permit, and fully and timely comply with the terms of the municipal NPDES permit while the CSWMP and the WMAP are being developed by the permittees under the municipal NPDES permit, and in contemplation of the subsequent amendment of this chapter or adoption by the City of additional provisions of this chapter to implement the subsequently adopted CSWMP and WMAP, or other programs developed under the municipal NPDES permit.*		
Pico Rivera	Title 16- Environment, Chapter 16.04, Stormwater and Urban Runoff Pollution Prevention	http://qcode.us/codes/picorivera
16.01.010 Purpose and Intent (4) - *Reducing pollutant loads in storm water and urban runoff, from land uses and activities identified in the municipal NPDES permit.* *The provisions of this chapter are adopted pursuant to the Federal Water Pollution Control Act, also known as the "Clean Water Act," codified and amended at 33 U.S.C 1251 et seq. The intent of this chapter is to enhance and protect the water quality of the receiving waters of the United States in a manner that is consistent with the Clean Water Act and acts amendatory thereof of supplementary thereto; applicable implementing regulations; the Municipal NPDES permit, and any amendment, revisions, or re-issuance thereof. (Ord. 989 § 1 (part), 2002).*		
Santa Fe Springs	Title V: Public Works- 52, Stormwater Runoff	http://www.amlegal.com/library/ca/santafesprings.shtml
§ 52.01 Purpose and Intent- *The purpose of this chapter is to protect the health, safety and general welfare of the citizens, and to reduce the quantity of pollutants being discharged to the waters of the United States by: (F) Protecting and enhancing the quality of the waters of the United States in a manner consistent with the provisions of the Clean Water Act.*		
Whittier	Title 8-Health and Safety, Chapter 8.36, Stormwater and Runoff Pollution Control	https://library.municode.com/index.aspx?clientId=16695
8.36.030 Purpose and Intent- *The purpose of this chapter is to protect and improve water quality of receiving waters by: (E) reducing pollutant loads in stormwater and urban runoff, from land uses and activities identified in the municipal NPDES permit.*		

8 COORDINATED INTEGRATED MONITORING PROGRAM

The Participating Agencies have developed a customized coordinated integrated monitoring program (CIMP). The CIMP, based on the provisions set forth in Part IV of the MRP (Attachment E) of the MS4 Permit, assesses progress toward achieving the water quality-based effluent limitations and receiving water limitations per the compliance schedules, and progress toward addressing water quality priorities. The customized monitoring program is designed to address the Primary Objectives detailed in Attachment E, Part II.A of the MS4 Permit and includes the following program elements:

- Receiving Water Monitoring
- Storm Water Outfall Monitoring
- Non-Storm Water Outfall Monitoring
- New Development/Re-Development Effectiveness Tracking
- Regional Studies

The CIMP is included in Appendix 8-1.

9 ADAPTIVE MANAGEMENT PROCESS

Adaptive management is the process by which new information about the state of the watershed is incorporated into the WMP. The WMP is adaptively managed following the process described in Permit §IV.C.8. The process is implemented by the participating agencies every two years from the date of WMP approval by the Regional Water Board (or by the Executive Officer on behalf of the Regional Water Board). The purpose of the adaptive management process is to improve the effectiveness of the WMP based on – but not limited to – consideration of the following:

1. Progress toward achieving interim and/or final water quality-based effluent limitations and/or receiving water limitations in §VI.E and Attachments L through R of the MS4 Permit, according to established compliance schedules;
2. Progress toward achieving improved water quality in MS4 discharges and achieving receiving water limitations through implementation of the watershed control measures based on an evaluation of outfall-based monitoring data and receiving water monitoring data;
3. Achievement of interim milestones;
4. Re-evaluation of the water quality priorities identified for the Watershed Management Area (WMA) based on more recent water quality data for discharges from the MS4 and the receiving water(s) and a reassessment of sources of pollutants in MS4 discharges;
5. Availability of new information and data from sources other than the MS4 Permittees' monitoring program(s) within the WMA that informs the effectiveness of the actions implemented by the Permittees;
6. Regional Water Board recommendations; and
7. Recommendations for modifications to the Watershed Management Program solicited through a public participation process.

9.1 MODIFICATIONS

Based on the results of the adaptive management process, the participating agencies may find that modifications of the WMP are necessary to improve effectiveness. Modifications may include new compliance deadlines and interim milestones, with the exception of those compliance deadlines established in a TMDL.

9.1.1 REPORTING

Modifications are reported in the Annual Report, as required pursuant to Part XVIII.A.6 of the Permit Monitoring and Reporting Program (No. CI-6958), and as part of the Report of Waste Discharge (ROWD) required pursuant to Part II.B of Attachment D – Standard Provisions. The background and rational for these modifications are included by addressing the following points:

- Identify the most effective control measures and describe why the measures were effective and how other control measures will be optimized based on past experiences.

- Identify the least effective control measures and describe why the measures were deemed ineffective and how the control measures will be modified or terminated.
- Identify significant changes to control measures during the prior year and the rationale for the changes.
- Describe all significant changes to control measures anticipated to be made in the next year and the rationale for the changes. Those changes requiring approval of the Regional Water Board or its Executive Officer shall be clearly identified at the beginning of the Annual Report.
- Include a detailed description of control measures to be applied to New Development or Re-development projects disturbing more than 50 acres.
- Provide the status of all multi-year efforts that were not completed in the current year and will continue into the subsequent year(s).

9.1.2 IMPLEMENTATION

Modifications are implemented upon approval by the Regional Water Board Executive Officer or within 60 days of submittal if the Regional Water Board Executive Officer expresses no objections.

9.2 RECEIVING WATER LIMITATIONS

The adaptive management process fulfills the requirements in MS4 Permit §V.A.4 to address continuing exceedances of receiving water limitations.

10 REPORTING PROGRAM & ASSESSMENT

10.1 ANNUAL REPORT

PERMIT MRP §XV.A (LA/LB)

Each year on or before December 15th, the participating agencies will submit, either jointly or individually, an annual report to the Regional Water Board Executive Officer. The annual report will present a summary of information that will allow the Regional Board to assess implementation and effectiveness of the watershed management program[1].

The reporting process is intended to meet the following objectives:

- Each agency's participation in one or more Watershed Management Programs.
- The impact of each agency's storm water and non-storm water discharges on the receiving water.
- Compliance with receiving water limitations, numeric water quality-based effluent limitations, and non-storm water action levels.
- The effectiveness of control measures in reducing discharges of pollutants from the MS4 to receiving waters.
- Whether the quality of MS4 discharges and the health of receiving waters is improving, staying the same, or declining as a result watershed management program efforts, and/or TMDL implementation measures, or other Minimum Control Measures.
- Whether changes in water quality can be attributed to pollutant controls imposed on new development, re-development, or retrofit projects.

Annual Report will identify data collected and strategies, control measures and assessments implemented for each watershed within the participating agency's jurisdiction. The report will include summaries for each of the following seven sections as required by the MS4 Permit:

1) Stormwater Control Measures -Summary of New Development/Re-development Projects, actions to comply with TMDL provisions
2) Effectiveness Assessment of Stormwater Control Measures -Summary of rainfall data, provide assessment and compare water quality data, summary to whether or not water quality is improving
3) Non-Stormwater Control Measures -Summary of outfalls screening
4) Effectiveness Assessment of Non-Storm Water Control Measures -Summary of the effectiveness of control measures implemented
5) Integrated Monitoring Compliance Report - Report with summary of all identified exceedances of outfall-based stormwater monitoring data, we weather receiving water monitoring data, dry weather receiving water data and non-storm water outfall monitoring data
6) Adaptive Management Strategies -Summary of effective, less effective control measures

[1] Annual reports will cover summary from previous fiscal year beginning June 1st through July 30th.

7) Supporting Data and Information - Monitoring data summary

The participating agencies will submit annual reports as required by the MS4 Permit. The Regional Board is currently preparing a reporting format. Once available, the reporting form will be incorporated into the WMP as an appendix.

10.1.1 DATA REPORTING *PERMIT MRP §XIV.L (LA/LB)*

Analytical data reports will be submitted on a semi-annual basis. Data will be sent electronically to the Regional Water Board's Storm Water site at MS4stormwaterRB4@waterboards.ca.gov. These data reports will summarize:

- Exceedances of applicable WQBELs, receiving water limitations, or any available interim action levels or other aquatic toxicity thresholds.
- Basic information regarding sampling dates, locations, or other pertinent documentation.

10.1.2 CHRONIC TOXICITY REPORTING *PERMIT MRP §XII.K (LA/LB)*

Aquatic toxicity monitoring results will be submitted to the Regional Board on an annual basis as part of the integrated monitoring compliance report as well as in the semi-annual basis data report submittal.

10.2 WATERSHED REPORT *PERMIT MRP §XVII.A (LA/LB)*

The participating agencies will submit biennial watershed reports as required by the MS4 Permit to the Regional Water Board Executive Officer. This biennial report, which will be included in the annual report in odd years, will include information related to the following sections:

- Watershed Management Area
- Subwatershed (HUC-12) Description
- Description of the Permittees Drainage Area within the Subwatershed

Per MS4 Permit § XVII.B, the participating agencies may reference the Watershed Management Program (WMP) in the odd-year report, when the required information is already included or addressed in this WMP, to satisfy baseline information requirements.

The Regional Board is currently preparing a reporting format. Once available, the reporting form will be incorporated into the WMP as an appendix.

10.3 TMDL REPORTING *PERMIT MRP §XIX (LA/LB)*

The participating agencies will also submit an annual report to the Regional Water Board Executive Officer regarding progress of TMDL implementation within the watershed.

The TMDLs that will be addressed in the report are:

- Metals and Selenium
- Harbor Toxics
- Bacteria

The Regional Board is currently preparing a reporting format. Once available, the reporting form will be incorporated into the WMP as an appendix.