Los Angeles River Upper Reach 2 Watershed Management Area

Watershed Management Program (WMP) Plan DRAFT

Submittal Date: June 26, 2014

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Watershed Management Program (WMP) Plan

Prepared for the:

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Acronyms

AIN	Assessor Identification Number
AMP	Adaptive Management Process
ARS	Automatic Retracting Screen
BMP	Best Management Practice
BSI	Bacteria Source Identification
CARE	Community Action for a Renewed Environment
CBE	Communities for a Better Environment
CDS	Continuous Deflective Separation
CEEIN	California Environmental Education Interagency Network
CIMP	Coordinated Integrated Monitoring Program
CMP	Coordinated Monitoring Plan
COG	Council of Governments
CPI	Catchment Priority Index
CPS	Connector Pipe Screen
CREST	Cleaner Rivers through Effective Stakeholder-led TMDLs
CTR	California Toxics Rule
CWA	Clean Water Act
CWH	Council for Watershed Health
CWSRF	Clean Water State Revolving Fund
DTSC	Department of Toxic Substances Control
EWMP	Enhanced Watershed Management Program
GIS	Geographic Information System
GWMA	Gateway Water Management Authority
HCF	Habitat Conservation Fund
HFS	High Flow Suspension
HHWC	Household Hazardous Waste Collection
HSPF	Hydrologic Simulation Program - FORTRAN
IC/ID	Illicit Connection and Illicit Discharges
IDDE	Illicit Discharge Detection Elimination
IRWM	Integrated Regional Water Management
ISRF	Infrastructure State Revolving Fund
LACFCD	Los Angeles County Flood Control District
LAR	Los Angeles River
LAR UR2 WMA	Los Angeles River Upper Reach 2 Watershed Management Area
LARWMP	Los Angeles River Watershed Monitoring Program
LARWQCB	Los Angeles Regional Water Quality Control Board
LID	Low Impact Development
LRS	Load Reduction Strategy
LSPC	Loading Simulation Program in C++
LWCF	Land and Water Conservation Fund
MAL	Municipal Action Limit

MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MOU	Memorandum of Understanding
MRP	Monitoring and Reporting Program
MS4	Municipal Separate Storm and Sewer System
NCPI	Nodal Catchment Priority Index
NGO	Non Governmental Organization
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAL	Office of Administrative Law
P2	Pollution Prevention
PIPP	Public Information and Participation Program
POTW	Publically Owned Treatment Works
QA/QC	Quality Assurance/Quality Control
RAA	Reasonable Assurance Analysis
RTP	Recreational Trails Program
RWL	Receiving Water Limitation
SB	Senate Bill
SBPAT	Structural BMP Prioritization and Analysis Tool
SRP	Spill Response Plan
SSO	Site Specific Objective
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TLR	Target Load Reduction
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
WBPC	Water Body-Pollutant Combination
WCB	Wildlife Conservation Board
WCM	Watershed Control Measure
WDR	Waste Discharge Requirement
WLA	Waste Load Allocation
WMA	Watershed Management Area
WMP	Watershed Management Program
WRP	Water Recovery Plant
WQBEL	Water Quality-Based Effluent Limitation
WQO	Water Quality Objective

Executive Summary

The California Regional Water Quality Control Board, Los Angeles Region (LARWQCB), adopted the fourth term Coastal Los Angeles County Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit as Order No. R4-2012-0175, on November 8, 2012, which then became effective on December 28, 2012. This Permit encourages Permittees to join together into Watershed Management Groups and develop Watershed Management Program (WMP), or Enhanced WMP (EWMP), Plans. These plans are intended to guide the iterative Adaptive Management Process (AMP) for the individual groups as they prioritize the implementation of Watershed Control Measures (WCMs) to reduce the discharge of runoff, and the pollutants it may convey, to local receiving waters, thereby contributing to the attainment and protection of water body beneficial uses.

In a June 27, 2013, Notice of Intent (NOI) letter, which was acknowledged in a September 25, 2013, NOI Approval letter from the Regional Board Executive Officer, the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon, along with the Los Angeles County Flood Control District (LACFCD), announced the formation of the Los Angeles River Upper Reach 2 Watershed Management Area (LAR UR2 WMA). Furthermore these Permittees agreed to prepare a Reasonable Assurance Analysis (RAA), to guide development of the WMP Plan, and a Coordinated Integrated Monitoring Program (CIMP) Plan to track progress in attaining the Permit goals and objectives, through the iterative AMP identified within MS4 Permit Part VI.C.8.a.

The LAR UR2 WMA Cities lie exclusively within the Los Angeles River Watershed and each Permittee discharges to Reach 2 of the Los Angeles River, a concrete-lined river channel with year-round flows comprised primarily of treated wastewater. The Cities of Bell Gardens and Commerce also drain southeast to the normally dry concrete-lined Rio Hondo tributary channel. To the north and west, the LAR UR2 WMA is bordered by, and receives discharges from, the Upper Los Angeles River EWMP Group, while the Lower Los Angeles River WMP Group aligns with the east and south LAR UR2 WMA borders.

Many of the watershed water quality impairments were previously identified as Total Maximum Daily Loads (TMDLs) and are being successfully addressed by the LAR UR2 WMA Permittees. The Trash TMDL was primarily implemented through a grant to the Gateway Water Management Authority (GWMA) and remaining capital projects should be completed within two years. The nutrient TMDL was primarily directed at wastewater recovery plants and has been implemented. The Metals TMDL listings for copper and lead were addressed through a $2,100,000 Site Specific Objective (SSO) Study that should be adopted as a Regional Board Basin Plan Amendment. Permittees also instigated legislation to reformulate automotive friction (brake) pads as a copper source control and phase out lead wheel weights.

The RAA identified zinc and *E. coli* as the pollutants driving implementation of costly new pollutant source and watershed control measures, including Minimum Control Measures (MCMs), Low Impact Development (LID), LID and Green Street projects, Low Flow Diversions (LFDs), scientific studies, increased inspections and enforcement, and structural Best Management Practices (BMPs).

The LAR UR2 RAA and WMP identified six regional BMP projects, estimated to cost a total of $210 million, and an additional $90 million in residential and commercial LID street renovations that may need to be implemented, over the next two decades, to achieve Permit numeric limits. The six conceptual regional projects were located under public lands, such as parks and easements, to avoid land acquisition costs; however the WMP costs are beyond City budgets and will require outside funding support to implement. While the LAR UR2 WMA will begin applying for support to construct these facilities, City and regional management should also consider undertaking studies or efforts to more accurately characterize jurisdictional Event Mean Concentration (EMC) pollutant loads, a zinc water effects ratio (WER) SSO study, and identify land acquisition opportunities near subwatershed outfalls, where the effectiveness of regional structural BMPs to control the discharge of bacterial laden runoff is maximized.

1. Introduction

This Watershed Management Program (WMP) Plan introduces the Los Angeles River Upper Reach 2 Watershed Management Area (LAR UR2 WMA), characterizes water quality challenges faced by its Permittees, and describes implementation actions and activities to demonstrate that Municipal Separate Storm Sewer System (MS4) discharges achieve applicable Water Quality-Based Effluent Limitations (WQBELs) and do not cause or contribute to exceedances of Receiving Water Limitations (RWLs) as required by the fourth term 2012 Los Angeles County MS4 National Pollutant Discharge Elimination System (NPDES) Permit (Order No. R4-2012-0175). This WMP plan is critical component of the iterative Adaptive Management Process (AMP) strategy and will be updated every two years as described in the MS4 Permit, or amended with minor corrections as warranted by changing regional precedents and the development of new scientific and technical data. The WMP is a comprehensive stormwater management plan intended to allow optimization of the extremely limited stormwater and financial resources of the participating Permittees. The development of this program required the determination of current water quality priorities in the LAR UR2 WMA and the identification of structural and non-structural Watershed Control Measures (WCMs) that would address those priorities. In addition, the LAR UR2 WMA Reasonable Assurance Analysis (RAA) demonstrates, through a calibrated model, that Water Quality Objectives (WQOs) will be met through implementation of the actions in this Plan.

1.1 Applicability for WMP Development

Permittees participating in the LAR UR2 WMA WMP include the Los Angeles County Flood Control District (LACFCD) and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon. The LAR UR2 WMA is within the Los Angeles River (LAR) Watershed and based on Geographical Information System (GIS) subwatershed data available from Los Angeles County[1], directly drains to LAR Reach 2, Rio Hondo Reach 1, and potentially to Compton Creek, as illustrated in **Figure 1-1**. The reported tributary area to each of these receiving waters, on a jurisdictional basis, is summarized in **Table 1-1**. The LAR UR2 WMA Permittees prepared and submitted a Notice of Intent (NOI) on June 27, 2013, as found in **Appendix A,** which was acknowledged in a September 25, 2013, NOI Approval letter from the Regional Board Executive Officer, as found in **Appendix B**.

Table 1-1 Jurisdictions within LAR UR2 WMA

LAR UR2 WMA Member	Alhambra Wash Rio Hondo		Chavez Ravine Los Angeles River		Compton Creek Los Angeles River	
	Area (acres)	% LAR UR2 WMA	Area (acres)	% LAR UR2 WMA	Area (acres)	% LAR UR2 WMA
Bell	0	0%	1,676	14%	0	0%
Bell Gardens	797	35%	780	6%	0	0%
Commerce	1,478	65%	2,717	22%	0	0%
Cudahy	0	0%	786	6%	0	0%
Huntington Park	0	0%	1,885	15%	45	100%
Maywood	0	0%	754	6%	0	0%
Vernon	0	0%	3,298	31%	0	0%
LACFCD	N/A		N/A		N/A	
Total	**2,275**	**100%**	**11,896**	**100%**	**45**	**100%**

[1] http://dpw.lacounty.gov/general/spatiallibrary/

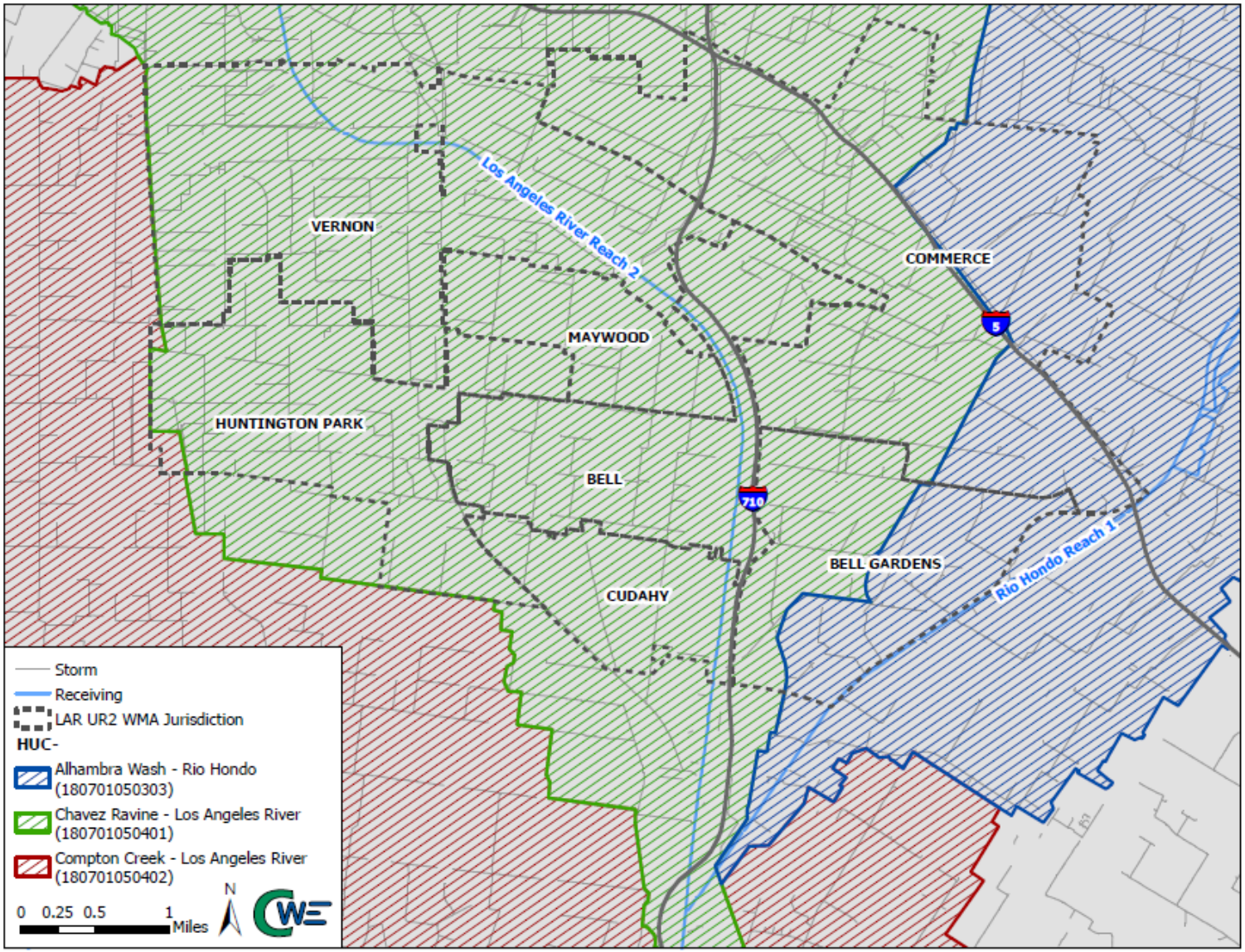


Figure 1-1 LAR UR2 WMA HUC-12s and Jurisdictions

1.2 Geographic Scope and Characteristics

The LAR UR2 WMA encompasses approximately 14,215 acres, or 22.21 square miles, and is located in the south central portion of the LAR Watershed as illustrated in **Figure 1-2**. Pertinent characteristics of the LAR UR2 WMA, including land use, soil type, hydrologic parameters, receiving waters, and their LARWQCB Basin Plan identified beneficial uses, are briefly summarized in the following subsections. Both the Cities of Bell and Vernon cross the LAR, while the City of Huntington Park is located a significant distance from it.

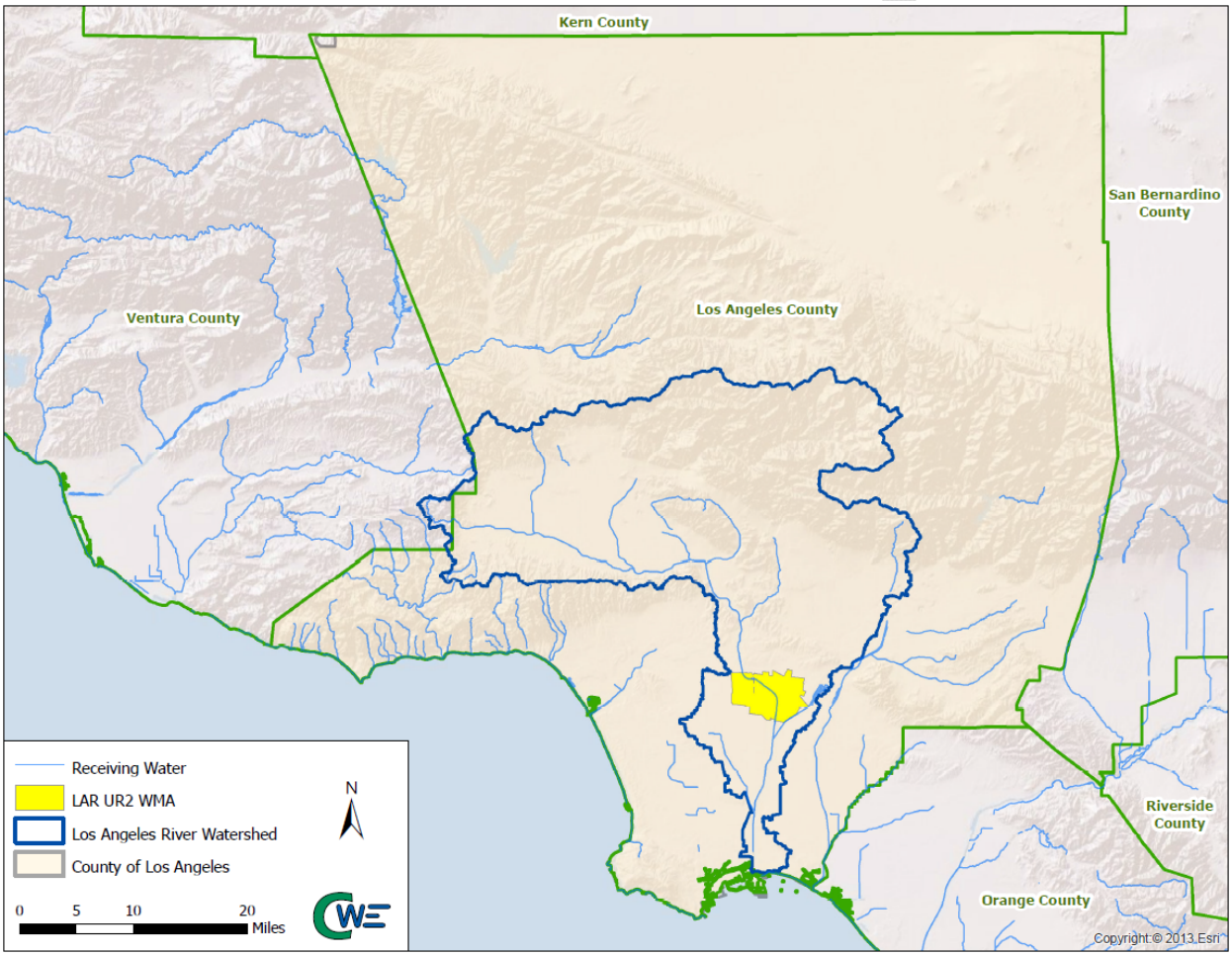


Figure 1-2 LAR UR2 WMA within the Los Angeles River Watershed

1.2.1 Watershed Management Area Hydrologic Characteristics

While each City has unique land use and zoning characteristics that may differentially impact pollutant generation, for the initial WMP and RAA development purposes, land use characteristics were initially identified based on the Los Angeles County Department of Public Works (LACDPW) GIS data as summarized in **Table 1-2** for the WMA and illustrated in **Figure 1-3**. The most prevalent land use in the Cities of Commerce, Vernon and the northern portions of Bell and Huntington Park is industrial, while the remaining areas are dominated by residential and commercial land use categories. **Table 1-3** provides a detailed description of WMA land use characteristics on a jurisdictional level.

Table 1-2 Land Use Designation within LAR UR2 WMA		
Land Use Category	**Area (acres)**	**Percent of LAR UR2 WMA**
Agriculture	46	0%
Commercial	1,419	10%
Education	311	2%
Industrial	6,029	42%
Multi-Family Residential	2,413	17%
Single Family Residential	1,784	13%
Transportation	1,370	10%
Vacant	843	6%
Total	14,215	100%

Table 1-3 Land Use Designation within LAR UR2 WMA by Jurisdiction

LAR UR2 WMA Member	Bell		Bell Gardens		Commerce		Cudahy		Huntington Park		Maywood		Vernon	
	Area (acre)	%	Area (acre)	%	Area (acre)	%	Area (acre)	%	Area (acre)	%	Area (acre)	%	Area (acre)	%
Agriculture	0	0	27	2	19	0	0	0	0	0	0	0	0	0
Commercial	271	16	230	15	383	9	58	7	352	18	109	14	16	0
Education	39	2	97	6	24	1	38	5	90	5	20	3	3	0
Industrial	296	18	164	10	2,523	60	104	13	333	17	52	7	2,556	78
MF Residential	513	31	736	47	129	3	434	55	480	25	121	16	0	0
SF Residential	272	16	175	11	292	7	51	6	562	29	430	57	1	0
Transportation	131	8	8	1	651	16	24	3	53	3	9	1	494	15
Vacant	154	9	141	9	173	4	76	10	59	3	13	2	227	7
Total:	**1,676**	**100**	**1,578**	**100**	**4,194**	**100**	**786**	**100**	**1,930**	**100**	**754**	**100**	**3,298**	**100**

MF = Multi-Family; SF = Single Family

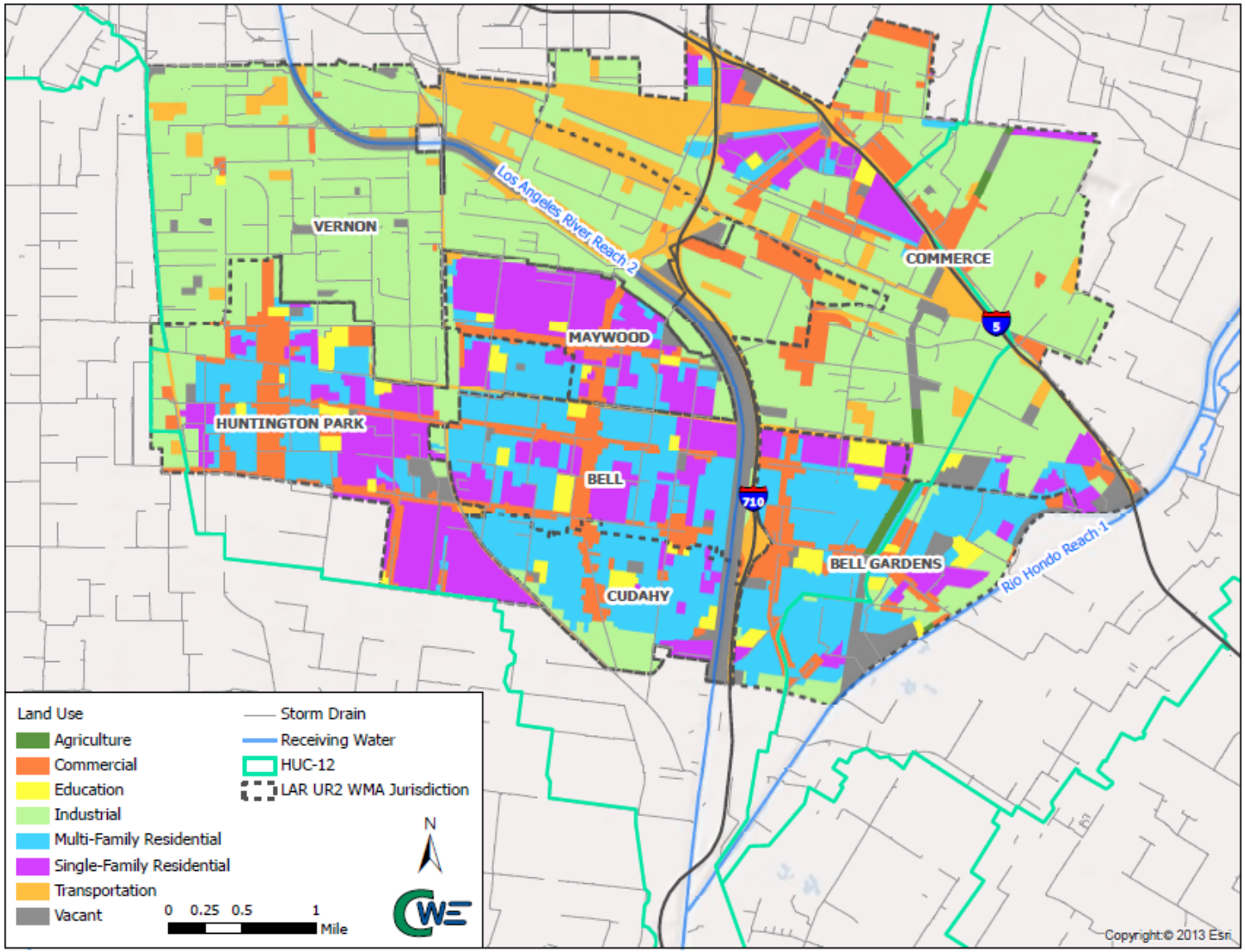


Figure 1-3 LAR UR2 WMA Land Use

The 2006 Los Angeles County Hydrology Manual[2] Appendices B and C, identifies soil types in the LAR UR2 WMA as being dominated by Hanford Fine Sandy Loam and other loam mixes as shown in **Figure 1-4**. Infiltration rates through these soils are generally unremarkable, but allowing percolation over extended periods, when vector access and egress can be prevented or controlled. While clay lenses are present, they are generally discontinuous and may sometimes be breached by utilizing moderate increase or variances in excavation depth, or through wick drains that maintain a wider than deep facility design configuration.

The 2004 LACFCD Analysis of 85th Percentile, 24-hour Rainfall Depth Analysis within the County of Los Angeles[3] reports that the lowest rainfall depth isohyetal of 0.88 inches is found in the northeastern corner of the WMA and that depths rise as you move to either the west or south of that location. The largest rainfall depth isohyetal of 0.98 is located in the northwest WMA, while the mean value is approximately 0.92 inches as shown by the isohyetal distribution map in **Figure 1-5**.

The 2006 Los Angeles County Hydrology Manual[2] Appendix B identifies the twenty four-hour, fifty-year design storm isohyetals within the LAR UR2 WMA as varying from 5.6 inches on the western side to 5.9 inches in the eastern portion of the WMA, as shown in **Figure 1-6**.

[2] http://ladpw.org/wrd/Publication/engineering/2006_Hydrology_Manual/2006%20Hydrology%20Manual-Divided.pdf

[3] http://ladpw.org/wrd/Publication/engineering/Final_Report-Probability_Analysis_of_85th_Percentile_24-hr_Rainfall1.pdf

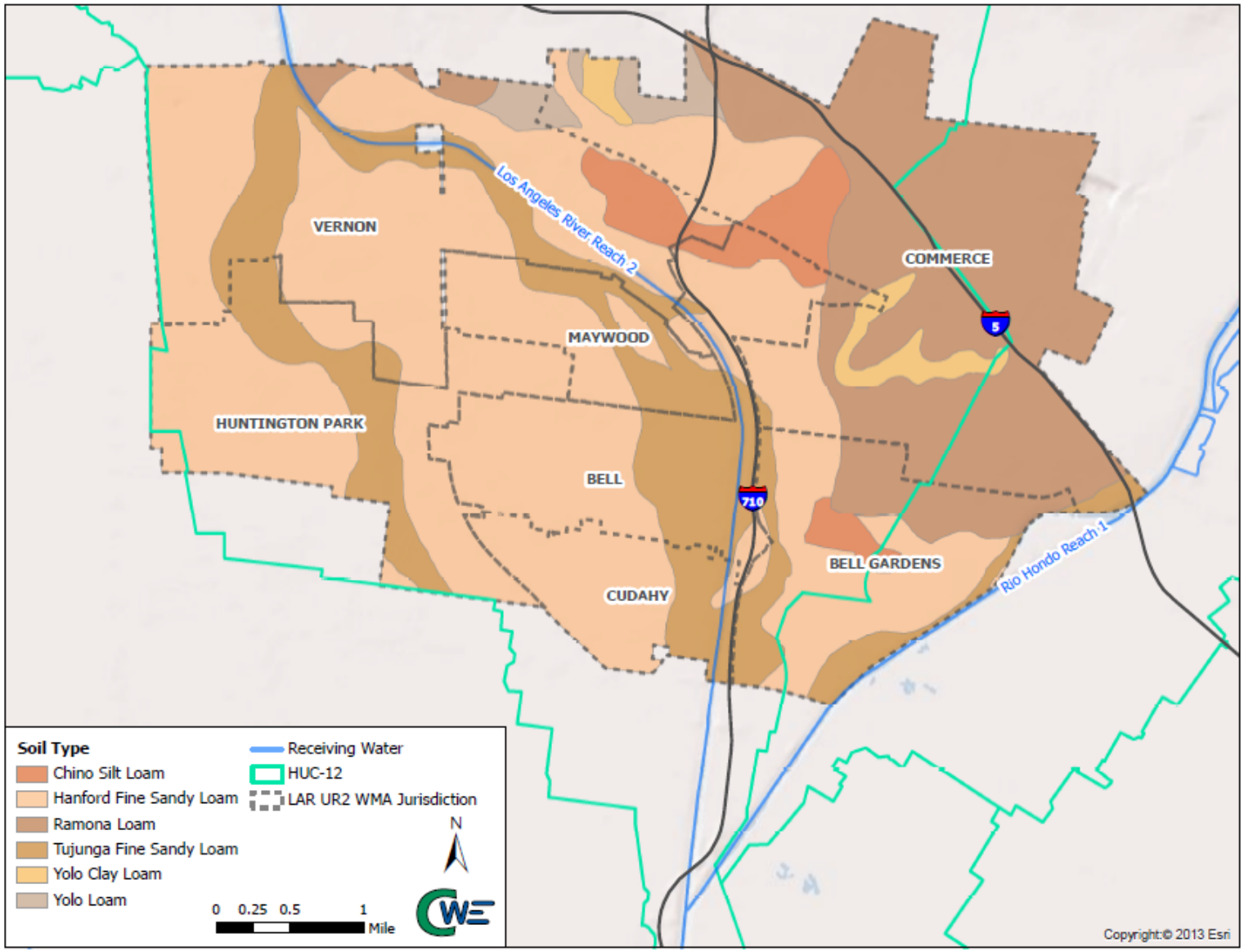


Figure 1-4 LAR UR2 WMA Soil Types

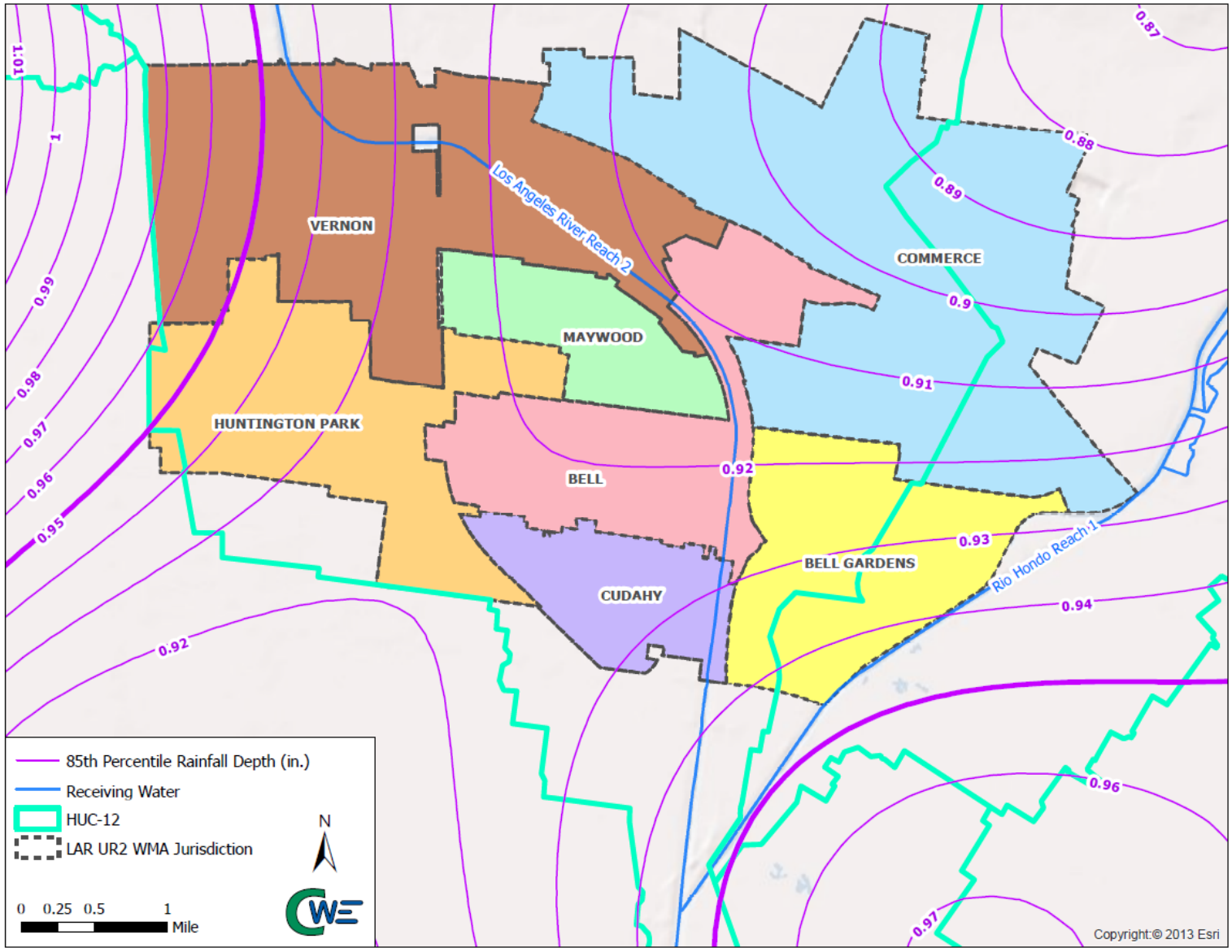


Figure 1-5 LAR UR2 WMA 85th Percentile, 24-Hour Rainfall Depths

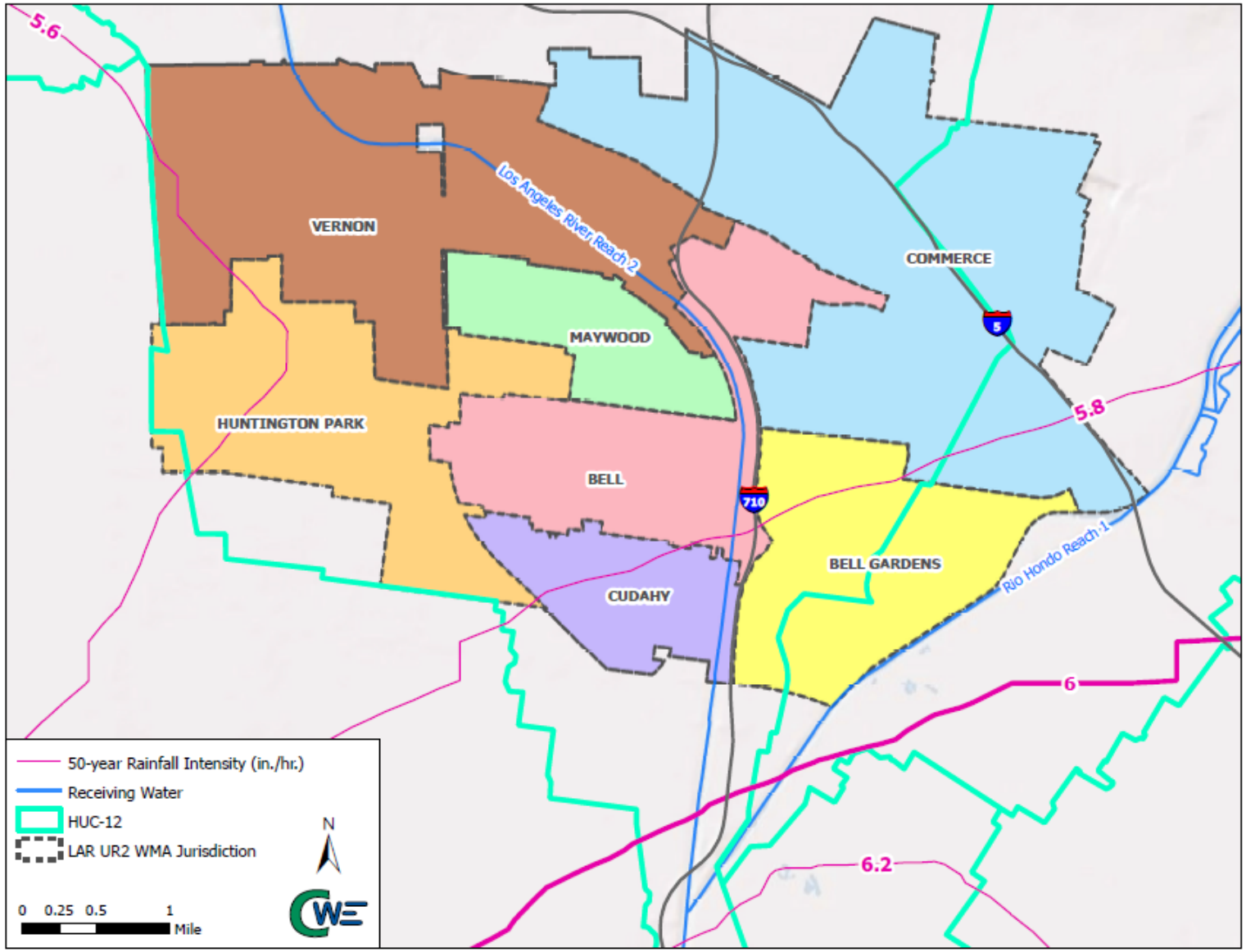


Figure 1-6 LAR UR2 WMA 50-Year, 24-Hour Rainfall Intensity

1.2.2 Water Body Characteristics

The LAR flows 51 miles from the Santa Monica Mountains, at the western end of the San Fernando Valley, to the Long Beach Harbor, San Pedro Bay, and Pacific Ocean. Including tributaries, such as the Rio Hondo and Compton Creek, the 824 square mile LAR watershed includes a total stream length of about 837 miles and about 4.6 square miles of lake area. No lakes are located within the LAR UR2 WMA. The watershed includes steep, easily eroded, undeveloped mountainous areas in the Angeles National Forest in the north and extensive urban areas in the midsection and south. Los Angeles River Reach 2 stretches from the Arroyo Seco confluence to the Compton Creek confluence. During dry-weather the LAR conveys mostly treated wastewater effluent from upstream Public Owned Treatment Works (POTWs) and Water Recovery Plants (WRPs). Following exceptionally productive storm seasons, rising groundwater in Glendale Narrows may supplement these LAR flows, along with other Board permitted industrial and individual dischargers, and dry-weather urban runoff discharges. The volume of these dry-weather discharges are expected to decline over time as more water is recycled.

The largest tributary to Reach 2 of the LAR is the Rio Hondo. The Rio Hondo drains approximately 120 square miles of the eastern LAR watershed. Below the Whittier Narrows, flows in Reach 2 of the Rio Hondo may be diverted to the adjacent Rio Hondo Spreading Grounds and used to recharge the Central Basin groundwater aquifer. These spreading grounds extend to the northeast corner of the WMA adjacent to the City of Commerce. Highly turbid "first flush" storm flows are not diverted into the spreading grounds, but drain into Rio Hondo Reach 1 which runs along the eastern boundary of the LAR UR2 WMA before flowing into the LAR below the LAR UR2 WMA. In conclusion, during dry-weather, flows in Reach 1 of the Rio Hondo are essentially absent, while during wet-weather, runoff volume and water quality my change abruptly due to upstream conditions that are beyond the control of the LAR UR2 WMA Permittees.

The LAR UR2 WMA is located within Reach 2 of the Los Angeles River, in the lower half of LAR Watershed, starting at East 26th Street in the City of Vernon and ending at Patata Street in City of Cudahy. The LAR UR2 WMA Cities of Bell Gardens and Commerce line the western bank of Rio Hondo Reach 1, while all WMA Permittees except the City of Huntington Park, line the LAR, as illustrated in **Figure 1-7**. Throughout these reaches, both the LAR and Rio Hondo are conveyed within concrete-lined trapezoidal channels, that have successfully contained regional flooding risks for decades. Dry-weather flows in some channel sections are further confined to narrow low-flow channels and the varying channel configurations in this area may impede water contact recreational beneficial uses. Given the large number and tributary area occupied by dischargers not regulated under the MS4 Permit, it may be challenging to separate their impact on dry-weather outfall and receiving water quality characteristics in the WMA. During dry- and wet-weather, it is likely that the LAR UR2 WMA's impact on receiving water conditions may be difficult to assess, given analytical limitations and the modest approximately 4% runoff contribution to the total flow in those receiving waters.

Waterfowl and other avian wildlife are commonly observed in the LAR within, and adjacent to, the MWA. Large congregations of gulls, are often observed near the proposed receiving water site at the extension of Tweedy Avenue in City of South Gate. However this location is immediately downstream of the largest outfalls from the WMA and shifting the monitoring location northward would further obfuscate the already modest contribution of the WMA on receiving water quality. Pending several years of water quality data collection, this predicament may necessitate the need for a special study to quantify the potential impact of this condition, further characterize the source of apparent Permit non-compliance, or guide the relocation of the monitoring site under some conditions of weather, flow, and wildlife use. Any study or monitoring changes would be proposed and coordinated in writing with Board staff.

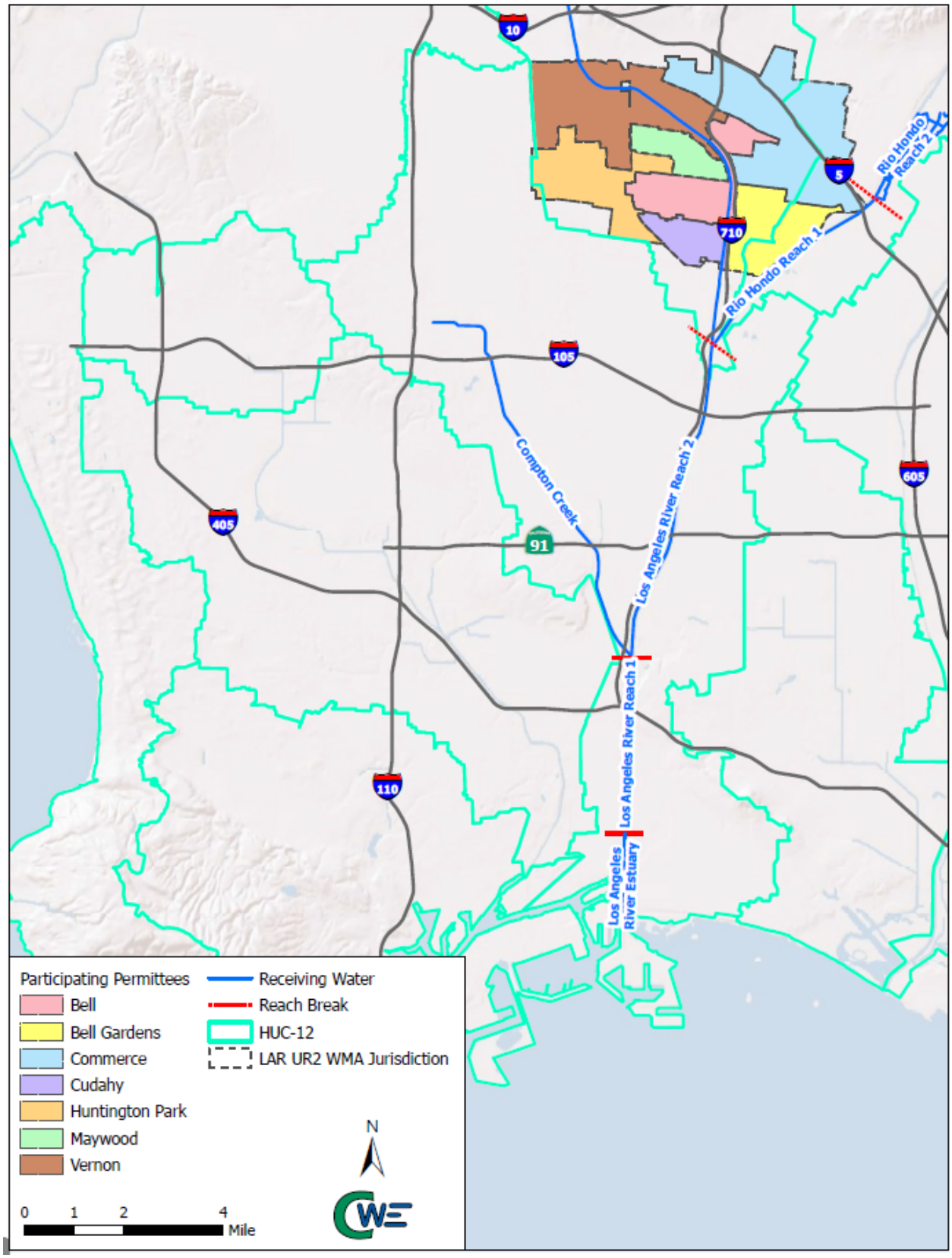


Figure 1-7 LAR UR2 WMA Water Bodies

1.3 Regulatory Framework

In 1972, provisions of the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA), were amended so that the discharge of pollutants to waters of the United States from any point source is effectively prohibited, unless the discharge is in compliance with an NPDES permit. The CWA was amended, as the Water Quality Act of 1987, to require the United States Environmental Protection Agency (USEPA) to establish a program to address stormwater discharges. In response, USEPA promulgated NPDES stormwater permit application regulations. These regulations required that facilities with stormwater discharges "...from a large or medium municipal storm sewer system; or (3) a discharge which USEPA or the state/tribe determines to contribute to a violation of a water quality standard..." apply for an NPDES permit. On November 16, 1990, the USEPA published final regulations that established application requirements for stormwater permits for MS4s serving a population of over 100,000 (Phase I communities) and certain industrial facilities, including construction sites greater than five acres. On December 8, 1999, the USEPA published the final regulations for communities under 100,000 (Phase II MS4s) and construction sites between one and five acres.

The Porter-Cologne Act (Water Code 13000, et seq.) is the principal water quality management legislation for California, requiring that the State Water Resources Control Board (SWRCB) and Regional Boards develop plans to serve as guides for protecting water quality within the state.

The California Regional Water Quality Control Board, Los Angeles Region (Regional Board or LARWQCB), Water Quality Control Plan (Basin Plan), identifies receiving waters, their beneficial uses, water quality objectives, and more specific discharge controls that may be applied to categories of discharges. The beneficial use designations for the LAR and the Rio Hondo include:

- **Municipal and Domestic Supply (MUN)** – Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- **Industrial Service Supply (IND)** – Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.
- **Ground Water Recharge (GWR)** – Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
- **Water Contact Recreation (REC-1)** – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
- **Non-contact Water Recreation (REC-2)** – Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- **Warm Freshwater Habitat (WARM) –** Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- **Wildlife Habitat (WILD) –** Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Table 1-4 summarizes the beneficial uses for the receiving water bodies located within the LAR UR2 WMA, as designated in the Basin Plan.

Table 1-4 Basin Plan Beneficial Use Designations Within the LAR UR2 WMA							
Receiving Water Bodies	**MUN**	**IND**	**GWR**	**REC-1**	**REC-2**	**WARM**	**WILD**
Los Angeles River	P*	P	E	Es	E	E	P
Rio Hondo below Spreading Grounds	P*		I	Pm	E	P	I

E: Existing beneficial Use
P: Potential beneficial Use
I: Intermittent beneficial Use
E, P, and I shall be protected as required.
Es: Access prohibited by Los Angeles County DPW
Pm: Access prohibited by Los Angeles County Department in the concrete-channelized areas.
* Asterisked MUN designations addressed by Senate Bill (SB) 88-63 and Regional Board (RB) Order 89-03.

Under Porter-Cologne, specific Waste Discharge Requirements (WDRs) are issued by the nine Regional Water Quality Control Boards and may serve as NPDES permits for discharges to surface waters.

1.3.1 MS4 Permit Requirements

The Regional Board adopted Order No. R4-2012-0175, WDRs for MS4 discharges within the Coastal Watersheds of Los Angeles County, except those discharges originating from the City of Long Beach MS4 (NPDES Permit No. CAS004001) on November 8, 2012, and it became effective on December 28, 2012. The MS4 Permit identifies Minimum Control Measures (MCMs), Total Maximum Daily Load (TMDL) provisions, the WMP Plan development process, and TMDL Waste Load Allocations (WLAs) as dry- and wet-weather numeric limits. Pursuant to Permit Part VI.C.1.d, WMPs must ensure that MS4 discharges:

(i) Achieve applicable WQBELs in Part VI.E and Attachment O based on the corresponding compliance schedules;
(ii) Do not cause or contribute to exceedances of the RWLs in Parts V.A and VI.E, and Attachment O of the MS4 Permit; and
(iii) Do not include non-stormwater discharges that are effectively prohibited based on Part III.A.

The WMP must also ensure that the controls are implemented to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP), pursuant to Part IV.A.1, and as proposed in the LAR UR2 WMP Plan. Part VI.C.1.f of the Permit states that the WMP must be consistent with Parts VI.C.5-C.8 and shall:

i. Prioritize water quality issues resulting from stormwater and non-stormwater discharges from the MS4 to receiving waters within their WMA.
ii. Identify and implement strategies, control measures, and Best Management Practices (BMPs) to achieve the outcomes specified in Part VI.C.1.d and discussed above.
iii. Execute an integrated monitoring program and assessment program pursuant to Attachment E - Monitoring and Reporting Program (MRP), Part VI to determine progress towards achieving applicable limitation and/or action levels in Attachment G.
iv. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the MRP to ensure that applicable numeric limits and other milestones set forth in the WMP are achieved in the required timeframes.
v. Provide appropriate opportunity for meaningful stakeholder input, including but not limited to, a permit-wide WMP Technical Advisory Committee (TAC) that will advise and participate in the development of the WMP from month six through the date of the program approval. The TAC may include at least one Permittee representative from each WMA for which a WMP will be developed, and must include a minimum of one public representative from a non-governmental organization (NGO) with public membership, staff from the Regional Board and USEPA Region IX.

Part VI.C.4.c.i of the MS4 Permit states that Permittees may elect to collaborate on the development and submission of a draft WMP by June 28, 2014, if the following conditions are met in greater than fifty percent of the land area covered by the WMP.

(1) Demonstrate that there are Low Impact Development (LID) ordinances in place and/or commence development of a LID ordinance(s) meeting the requirements of the MS4 Permit's Planning and Land Development Program by February 26, 2013, 60 days after the effective date of the MS4 Permit.
(2) Demonstrate that there are green streets policies in place and/or commence development of a policy(ies) that specifies the use of green street strategies for transportation corridors by February 26, 2013, 60 day after the effective date of the MS4 Permit.
(3) Demonstrate in the Notice of Intent (NOI) to develop a WMP that Parts VI.C.4.c.i. (1) and (2) have been met in greater than fifty percent of the watershed area.

Since these conditions have been met, the LAR UR2 WMA anticipates that the Regional Board will provide comments within four months after submittal of the WMP draft, and the final WMP must be submitted within the following three months. Three months after the submittal of the final WMP, and no later than April 28, 2015, the LAR UR2 WMA will be provided a final approval or denial by the Regional Board or by the Executive Officer on behalf of the Regional Board. Implementation of the WMP will begin upon approval, and the existing stormwater management programs and associated control measures must be implemented until then.

The requirements associated with the WMP are identified in Part VI.C.5 of the MS4 Permit, Program Development, and focuses on the:

a. Identification of water quality priorities;
b. Selection of watershed control measures; and
c. Compliance schedules.

The 2012 Los Angeles County MS4 Permit and LAR UR2 WMP Plan do not require implementation to the exclusion of other municipal priorities and the prioritization of its recommendations, or planning elements, may be iteratively modified based on the permit identified AMP, changing technical consideration, fiscal limitations, and societal priorities of the individual Permittees, as they may change from time to time. Furthermore, the proposals within the WMP Plan, are subject to revision or reversal, following consideration of the Own-Motion order, regarding the Permit Appeal and contents, before the SWRCB.

1.3.1.1 2012 MS4 Permit Review Process and WMP Implementation

On December 10, 2012 the cities of Commerce, Huntington Park and Vernon (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 (Permit) adopted by the California Regional Water Quality Control Board, Los Angeles Region (Regional Board). The Petitions were subsequently referred to as SWRCB/OCC File Nos. A-2236(a) through (kk). In particular, and among other terms/requirements contained in the Permit, the Cities have sought review of all numeric limits, both interim and final, and whether derived from a TMDL or provided from the application of an adopted water quality standard, or through a discharge prohibition set forth in the Permit. The challenges to the various numeric limits set forth in the Permit include a challenge to all such numeric limits that may be complied with through the implementation of an approved Watershed Management Plan (WMP) and/or an Enhanced Watershed Management Plan (EWMP). In essence, the Petitions are challenging the fundamental premise for the various WMPs and the EWMPs requirements in the Permit, on various grounds, including, but not limited to, on the grounds that such Permit terms

exceed the maximum extent practicable (MEP) standard, and were not adopted in accordance with the requirements of California Water Code (CWC) sections 13000, 13263 and 13241 The Cities are reserving all of their rights to subsequently assert that the identified BMPs need not be implemented, on the grounds that they are not technically or economically feasible. In other words, that the BMPs are impracticable and contrary to the MEP standard, and that it is not possible to provide the reasonable assurances required under the Permit in a manner that is consistent with the MEP standard, if at all. The Cities agree that it is not possible to provide the reasonable assurances required under the Permit in a manner that is consistent with the MEP standard. On July 8, 2013 the SWRCB advised the Cities that the respective Petitions were complete and all such Petitions remain pending at this time.

In spite of the pending Petitions, the Cities are acting in good faith and moving forward to attempt to comply with all of the applicable terms of the Permit, and look forward to working with the Regional Board to assess and implement the strategies and requirements necessary for compliance, including the development of an acceptable WMP. Nevertheless, because, through their Petitions, the Cities believe that many of the terms of the Permit are invalid, including the terms involving compliance with numeric limits which the Cities are seeking to comply with through the development and implementation of this WMP. the Cities hereby expressly reserve and are not waiving, with this submission or otherwise, any of their rights to challenge the need for any WMP, including their rights to seek to void or otherwise compel modifications to the Permit terms involving the WMP, or to void or compel revisions to any other part or portion of the Permit. In addition, the Cities are not waving, and hereby expressly reserve, any and all rights they have or may have to seek to recover the costs from the State to develop and implement this WMP, on the grounds that the WMP is being developed and will be implemented in order to comply with various mandates involving TMDLs, water quality standards and other similar Permit requirements, which requirements in the Permit are not mandated by the Clean Water Act, and with the Cities being unable to impose fees in order to recover their costs for developing and implementing this WMP.

1.3.2 Relevant TMDLs

TMDLs applicable to the LAR UR2 WMA are listed in **Table 1-5** and are further characterized in Section 2 regarding the WMP Plan water quality priorities. The resolutions numbers and effective dates reflect the most recent amendments to the Los Angeles River nitrogen and metals TMDLs. TMDL impacted reaches are highlighted in **Figure 1-8** and a detailed summary of the numeric WLAs specified in the MS4 Permit can be found in **Appendix C**.

Table 1-5 TMDLs Applicable to the LAR UR2 WMA

TMDL	LARWQCB Resolution Number	Effective Date
Los Angeles River Nitrogen Compounds and Related Effects TMDL	2003-009	March 23, 2004
	2012-010[1]	Not Yet Effective
Los Angeles River Trash	2007-012	September 23, 2008
Los Angeles River Metals TMDL	2007-014	October 29, 2008
	2010-003	November 3, 2011
Los Angeles River Bacteria TMDL	2010-007	March 23, 2012

[1] Site Specific Objectives (SSOs) for Ammonia were approved on June 4, 2013.

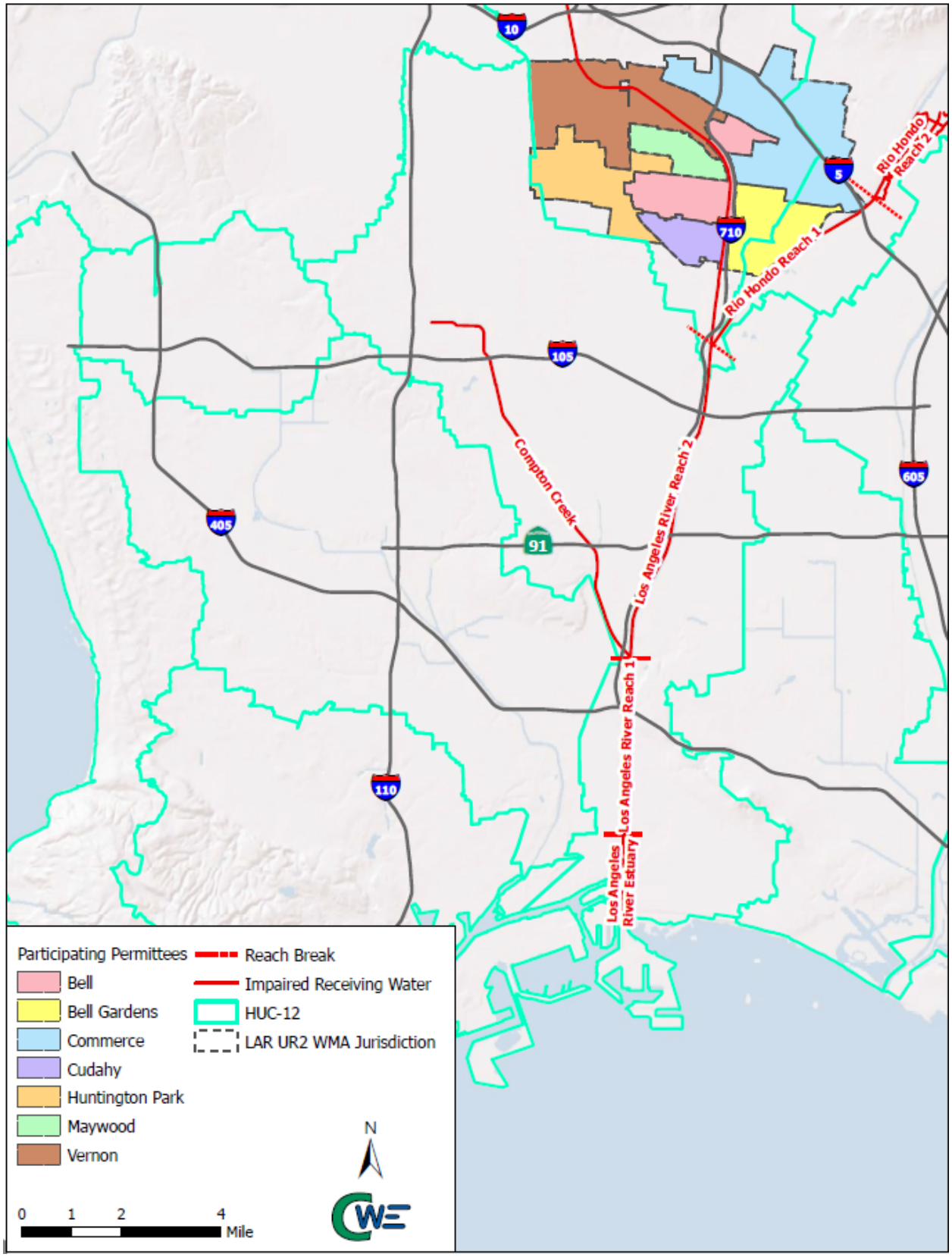


Figure 1-8 LAR UR2 WMA and Downstream Impaired Water Bodies

Regional Board adopted TMDLs include requirements to develop implementation plans, providing interim and final compliance dates. **Table 1-6** lists LAR UR2 WMA relevant interim and final compliance dates.

Two dry-weather compliance paths are applicable to the LAR bacteria TMDL, based on whether or not jurisdictions develop and implement a Load Reduction Strategy (LRS), which must quantitatively demonstrate that outfall specific actions result in attainment of the final WLAs. There are also required dry-weather "snapshot" monitoring events where every flowing outfall is sampled for bacterial indicators. Six snapshot monitoring events are required prior to LRS implementation, and three after, to assess effectiveness. Completing the LRS process provides regulatory relief by providing seven additional years before final effluent limitations become effective. The WMA proposes to combine and undertake the LAR and Rio Hondo LRS studies at the same time and submit the results by March 23, 2016, so that results are comparable and fair among the WMA Permittees. This is not expected to adversely impact water quality, as the City of Los Angeles Segment B LRS, undertaken prior to Permit adoption, identified three Low Flow Diversion (LFD) projects, that would be necessary to achieve interim objectives, and none were within the LAR UR2 WMA. The proposed LRS due date and corresponding interim and final compliance milestones for the dry-weather bacteria TMDL for the Los Angeles River are included in **Table 1-6**.

Revised numeric limits were incorporated into the MS4 Permit by the Regional Board after adoption and Office of Administrative Law (OAL) approval of the TMDL amendment. Site Specific Objectives for Copper and Lead were developed (LWA 2013), at considerable Permittee expense, and have been presented to the LARWQCB for future consideration as a Basin Plan Amendment of the LAR Metals TMDL.

1.3.3 Relevant 303(d) Listings

Receiving water impairments on the CWA 303(d) List, otherwise known as the State Integrated Report, but not currently addressed by a TMDL, include the following for the LAR UR2 WMA:

- **Los Angeles River Reach 2**
  - **Oil** – This constituent has an estimated TMDL completion date of 2019. Impairments for oil are based on a qualitative assessment of sheen and may result from natural constituents associated with algal growth. It is anticipated that remaining anthropogenic oil and grease will continue to be controlled through the enhanced weekly street vacuuming/sweeping program utilized by each of the LAR UR2 WMA Permittees and the installation of the Full Capture Certified (FCC) trash control devices which should be completed before the TMDL completion date. Furthermore, this condition may have originated in upstream areas where the interval between sweeping events is months, rather than a single week. Finally, the LAR UR2 WMA CIMP includes analytical monitoring during the first year to numerically assess the presence of this contaminant.
- **Rio Hondo Reach 1**
  - **Coliform Bacteria** – This constituent has an estimated completion date of 2019; however with the adoption of the Los Angeles River Bacteria TMDL this impairment is actually currently being addressed.
  - **Toxicity** – This impairment condition has an estimated TMDL completion date of 2021; however other toxicity listings have been addressed as a specific toxicant, such as a metal, for which a TMDL has already been developed. It is unclear that a source assessment can be developed, or a pollutant reduction strategy implemented for a condition or unknown constituent. The impairment listing is based on a single line of evidence consisting of only two positive toxicity tests using Fathead Minnows and *Ceriodaphnia dubia*. The LAR UR2 WMA CIMP proposes required annual toxicity tests, to assess whether this impairment remains or was a result of TMDL addressed metals concentrations or other conditions associated with the extremely low dry weather flows that were previously present in the Rio Hondo.

Table 1-6 Schedule of TMDL Compliance Milestones Applicable to the LAR UR2 WMA

TMDL	Water Bodies	Constituents	Compliance Goal	Weather Condition	Compliance Dates and Milestones (Bolded **numbers** indicate milestone deadlines within the current MS4 Permit term)[1]													
					2012	2013	2014	2015	2016	2017	2020	2022	2023	2024	2026	2028	2030	2032	2037
LAR Nitrogen	All	Ammonia, Nitrate, Nitrite, Nitrate+Nitrite	Meet WQBELs	All	**Pre 2012**														
					Final														
LAR Trash	All	Trash	% Reduction	All	**9/30**	**9/30**	**9/30**	**9/30**	**9/30**										
					70%	**80%**	**90%**	**96.7%**	**100%**										
LAR Metals	All	Copper, Lead, Zinc	% of MS4 area Meets WQBELs	Dry	**1/11**						1/11			1/11					
					50%						75%			100%					
	All	Copper, Lead, Zinc, Cadmium		Wet	**1/11**									1/11		1/11			
					25%									50%		100 %			
LAR Bacteria	All	*E. Coli*	Meet WQBELs	Dry w/o LRS									Final						
				Rio Hondo Segment B Dry w/ LRS					**LAR UR2 LRS Due[2]**				Interim				Final		
				LAR Segment B Dry w/ LRS			**LAR UR2 LRS Due[2]**		[2]			Interim				Final			
				Wet															Final

Notes: LAR = Los Angeles River

[1] The MS4 Permit term is five years from the MS4 Permit effective date or December 27, 2017.

[2] The LRS requires coordinated effort by all MS4 Permittees within a segment or tributary. An LRS must quantitatively demonstrate that the actions for specific outfalls are sufficient to result in attainment of the *final* WLAs. Requires six snapshot sampling events prior to LRS and three post-LRS snapshot sampling events. The LAR UR2 WMA proposes to shift the LAR LRS to coincide with the Rio Hondo LRS schedule, so that data and methods are comparable between Permittees. This is not anticipated to shift compliance as the prior City of Los Angeles LRS for segment B indicated that only three Low Flow Diversions upstream of the LAR UR2 WMA would be required for the first interim compliance step. Shifting the schedule will also allow LAR UR2 to complete its Non-Stormwater Discharge survey and initiate the source assessment in areas where there are large number of non-MS4 NPDES Permittees and facilities that have asserted a federal preemption from state water quality regulation, such as rail roads.

1.4 WMP Stakeholder Process

Permit Part VI.C.1.f.v, states that each WMP must provide appropriate opportunity for meaningful stakeholder input, including, but not limited to, a permit-wide watershed management program TAC that will advise and participate in the development of the WMP from month six through the date of approval. The MS4 Permit requires that the TAC include at least one Permittee representative from each WMA for which a WMP is being developed and one public representative from an NGO with public membership, staff from the Regional Board and USEPA Region IX. The City of Huntington Park regularly participated on the TAC, with the assistance of the City of Commerce as an alternate.

Rather than reaching out to distant NGO stakeholders with priorities beyond the central LAR watershed, the LAR UR2 WMA reached out to a local advocacy group Communities for A Better Environment[4] (CBE) in the City of Huntington Park. On February 26, 2014, representatives for the Permittees and CBE met and discussed the MS4 Permit and development of the WMP, RAA, and CIMP Plans. After discussing WCM and BMP alternatives, CBE asserted a preference for a distributed rain barrel retrofit program to support residential agricultural projects. Since this recommendation would need to be compatible with the RAA, additional discussions were deferred until after the Regional Board RAA Guidelines were released on March 25, 2014, and modeling scenarios could be analyzed. With bacteria as a dominant or driving pollutant, the SB-PAT model favored infiltration BMPs near subwatershed outfalls, which accept runoff from smaller events and allow larger events to be addressed as allowable exceedance days, over large numbers of distributed BMPs sized to rare larger events. Furthermore, since agricultural areas are generally modeled as a greater sources of nearly all pollutants than residential areas (Table 3.3 of the Regional Board RAA Guidelines), it is unlikely that any benefit would accrue. Further Permittee and CBE meetings will be planned during the Summer 2014 WMP review period; however, it is unclear that Regional Board MS4 Permit objectives align with those of local NGO stakeholders and in a worst case scenario, both the Regional Board and Permittees could be confronted with extensive new enforcement demands.

1.5 WMP Overview

The WMP documents the programs development process by detailing the water quality priorities within the LAR UR2 WMA, identifying existing, potential, and proposed control measures, and demonstrating through a model that WQOs will be satisfied in order to ensure compliance with the MS4 Permit. The WMP includes the following sections:

- **Section 2 - Water Quality Priorities**
  Receiving water bodies are identified and characterized based on available water quality data records. Water Body-Pollutant Classifications are developed so that categories can be assigned to each water body-pollutant combination. A source assessment was used to establish water quality priorities. The water quality priorities are the primary "driver" of the WMP.

- **Section 3 - Watershed Control Measures**
  This section outlines the existing, potential, and proposed control measures in LAR UR2 WMA. The current MCMs are described and an approach to modifying the programs, as well as potential modifications, is presented. Existing structural BMPs are identified an approach to identifying and selecting additional regional BMPs is included. The proposed watershed control measures will be implemented to address the water quality priorities.

[4] http://www.cbecal.org/

- **Section 4 - Reasonable Assurance Analysis**
  The modeling system being used by the LAR UR2 WMA is described. The modeling approach and process are discussed which involve Target Load Reductions and reductions associated with both structural and non-structural BMPs. The BMP assumptions and proposed BMPs are detailed along with the model output. The RAA modeled combinations of watershed control measures and BMPs to demonstrate their effectiveness in addressing the water quality priorities. The RAA demonstrates Target Load Reductions will be met, using the Site Specific Objectives for metals as presented in the Draft Los Angeles River Copper and Lead Special Study Implementation Report (Larry Walker and Associates, 2013).

- **Section 5 - Compliance Schedules and Costs**
  The LAR UR2 WMA identified interim milestones and dates to compliment TMDL final Waste Load Allocation (WLA) and compliance dates. These milestone dates were chosen at intervals to reflect key Permit and TMDL dates, while allowing sufficient time for monitoring data permit and implementation to progress in a meaningful fashion that might guide the iterative adaptive management process.

- **Section 6 - Legal Authority**
  As summarized in their 2012-13 Annual Reports, the LAR UR2 WMA Permittees have established the Legal Authorities required in Permit Part VI.A.2.

2. Water Quality Priorities

Identification of the water quality priorities in the LAR UR2 WMA is a key component of the WMP process. Part VI.C.5.a of the MS4 Permit outlines the pertinent elements of the prioritization process as follows:

1. Water quality characterization (VI.C.5.a.i) based on available monitoring data, TMDLs, 303(d) lists, storm water annual reports, etc.;
2. Water body-pollutant classification (VI.C.5.a.ii) to identify water body-pollutant combinations that fall into three MS4 Permit-defined categories;
3. Source assessment (VI.C.5.a.iii) for the water body-pollutant combinations in the three categories; and
4. Prioritization of the water body-pollutant combinations (VI.C.5.a.iv).

The three MS4 Permit defined categories are:

- Category 1 (Highest Priority): Water body-pollutant combinations for which numeric limits are established in Part VI.E and Attachments L through R of the MS4 Permit. Attachment O is the most applicable attachment for LAR UR2 WMA.

- Category 2 (High Priority): Pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's CWA Section 303(d) List (State 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.

The following sections presented below describe the characterization and prioritization of those water body-pollutant combinations (WBPCs) found to be issues in the LAR UR2 WMA.

2.1 Water Quality Characterization

Water quality monitoring data for the Los Angeles River Upper Reach 2 water body segments were gathered, assessed for quality and compiled into a database by wet-weather and dry-weather conditions and locations. Permittee specific discharge sampling has not been required under past permits; therefore, no information was identified. Water quality monitoring data was solicited from numerous sources, but the most useful and highest quality data relevant to the LAR UR2 WMA were obtained from the following sources:

- Los Angeles County Annual Mass Emission and Tributary Station Monitoring Data (2002 – 2012);
- Los Angeles River Metals TMDL Coordinated Monitoring Plan (CMP) Ambient Monitoring Program (2008 – 2013);
- Council for Watershed Health (CWH) Los Angeles River Watershed Monitoring Program (LARWMP) data (2009 – 2012); and
- Cleaner Rivers through Effective Stakeholder-led TMDLs (CREST) Los Angeles River Bacteria Source Identification (BSI) Study.

A review of these sources found that no monitoring locations were located within the LAR UR2 WMA. In order to conduct the MS4 Permit required data analysis, monitoring locations upstream or downstream of

the LAR UR2 WMA was assessed. Details of each data source are summarized below and a more detailed summary can be found in **Appendix D**.

All data were screened to identify potential water quality objective exceedances. The monitoring sites with relevant available data are illustrated in **Figure 2-1**. Monitoring data that met Quality Assurance and Quality Control (QA/QC) criteria were analyzed to determine constituents exceeding water quality objectives. The number of available analytical data values, detected data values, and total number of constituents analyzed in the primary LAR UR2 WMA receiving water bodies are summarized in **Table 2-1**.

Table 2-1 Summary of Water Quality Data Reviewed for LAR UR2 WMA

Receiving Water Body	10 Year (2002 – 2012)			5 Year (2007 – 2012)		
	Total Sample	Number Detect	Number of Constituents	Total Sample	Number Detect	Number of Constituents
Los Angeles River	10,524	3,529	169	6,700	2,425	165
Rio Hondo	2,006	715	157	70	70	7
Wet-Weather	7,761	2,413	169	3,891	1,226	165
Dry-Weather	4,769	1,831	170	2,879	1,269	167
Totals	**12,530**	**4,244**	**171**	**6,770**	**2,495**	**167**

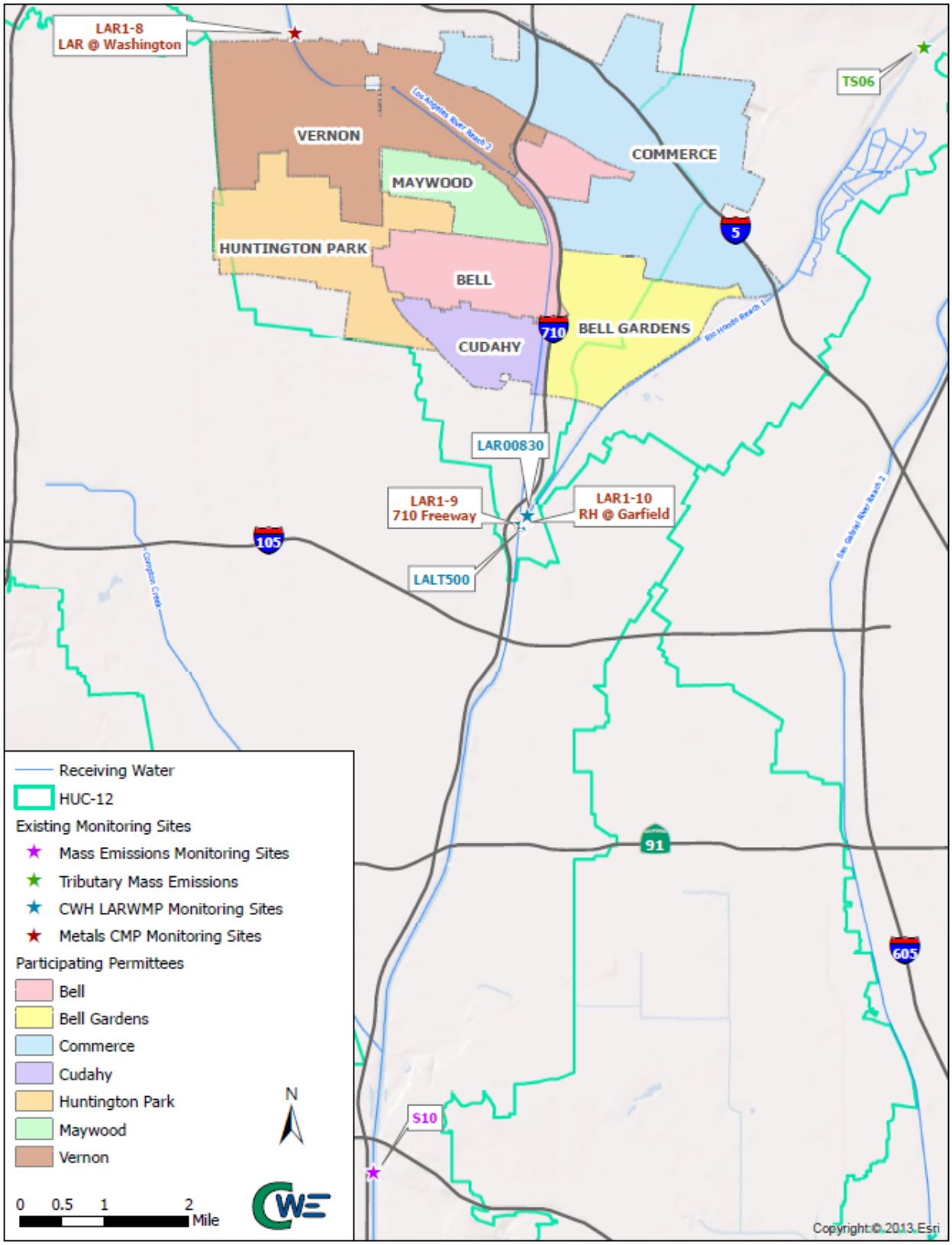


Figure 2-1 Existing Monitoring Sites Relevant to LAR UR2 WMA

Los Angeles County Annual Mass Emission and Tributary Station Monitoring Data

The Los Angeles County Department of Public Works Annual Stormwater Monitoring Report presents stormwater quality findings for each July to June storm season. The 2002–2003, 2003–2004, 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010, 2010-2011 and 2011-2012 monitoring reports addressed the following programs and associated elements:

- Core Monitoring Program – mass emission, tributary, water column toxicity, shoreline, and trash monitoring.
- Regional Monitoring Program – estuary sampling and bioassessment.
- Special studies – New Development Impacts Study in the Santa Clara Watershed, Peak Discharge Impact Study and BMP Effectiveness Study.

Monitoring data from the Los Angeles County Annual Mass Emission and Tributary Station Monitoring were analyzed for mass emission station S10 (Los Angeles River at Wardlow) and TS06 (Rio Hondo at Whittier Narrows).

Los Angeles River Metals TMDL CMP Ambient Monitoring Program

The CMP includes Tier I ambient monitoring program which collects monthly samples at thirteen locations. Tier I monitoring sites LAR1-8, LAR1-9, and LAR1-10 are located adjacent to the LAR UR2 WMA and the data from these sites help LAR UR2 WMA have a better understanding of the distribution of metals concentrations in the adjacent WMAs. Data for monitoring location LAR1-8, LAR1-9, and LAR1-10 were analyzed from the Los Angeles River Metals TMDL CMP. LAR1-8 is located upstream of the LAR UR2 WMA at Arroyo Seco, LAR1-9 is located downstream of the LAR UR2 WMA just above the Rio Hondo confluence, and LAR1-10 is located on the Rio Hondo just above the Los Angeles River confluence.

CWH LARWMP

CWH coordinates the LARWMP to assess watershed health based on five broad objectives: are stream conditions improving; are specific critical site conditions improving; do discharges meet WQOs; is it safe to swim; and are locally caught fish safe to eat. CWH water quality monitoring data was collected under a stratified randomized strategy so that most sites were not revisited, and only a limited number of constituents were tested at each site. CWH monitoring data for locations LALT500 and LAR00830 were included in the analysis.

CREST Los Angeles River BSI Study

The CREST Los Angeles River BSI Study was designed to characterize the bacteria inputs to the LA River, support the development of the Bacteria TMDL source assessment, and assist with prioritization of the types and locations of TMDL implementation actions. Since bacteria are already categorized as a Category 1 pollutant, findings of the study were not included in the monitoring data analysis, as the study focuses solely on bacteria, which is a Category 1 pollutant because of existing Los Angeles River Bacteria TMDL. Additional details regarding this study and its findings can be found in **Appendix D**.

2.1.1 Characterization of Receiving Water Quality

Receiving water bodies and constituents, or WBPCs, identified during the data review were individually evaluated based on number of analyses reported, number of detects, and number of exceedances. Constituents subject to a TMDL underwent a data review to determine the status of compliance, as

opposed to determining the appropriate Category of pollutant. Constituents on the CWA 303(d) list were analyzed based on the listing and current exceedance status. Constituents not TMDL or CWA 303(d) listed, but subject to basin plan, California Toxics Rule (CTR) or MS4 Permit water quality objectives were identified.

Analytes with exceedances in the past 10 years are presented in **Table 2-2** and subcategorized into TMDL, 303(d), and other source derivations. A comparison of the five and ten year data in **Table 2-2**, suggests a subtle decrease in the frequency with which exceedances are observed for most constituents. Cyanide, dissolved oxygen, chemical oxygen demand, chloride, and nitrite-N appeared to no longer demonstrate exceedances during the most recent 5 year period.

To further evaluate the data, comparisons of the Los Angeles River Reach 2 to Rio Hondo and wet- to dry-weather were also conducted. The comparison will help evaluate the constituents for each receiving water body during wet- and dry-weather conditions for five and ten year data sets. These comparisons are presented in **Table 2-3** to **Table 2-5**.

Table 2-3 demonstrates that, for the 10 year data set, wet-weather exceedances were more prevalent than dry-weather, for most constituents with the exception of cyanide, pH, nitrite-N, and mercury. The five year data set, presented in **Table 2-4**, shows an even greater percentage of exceedances in wet-weather. **Table 2-5** suggest that there were a higher percentage of exceedances in the Rio Hondo as compared to the Los Angeles River, with the exception of dissolved oxygen, pH, chemical oxygen demand, nitrite-N, total phosphorus, cadmium, chromium, mercury, nickel, and zinc. The higher percentages of exceedances may attribute to the limited number of samples collected for the Rio Hondo, as well as to the low or limited flow of the river.

This data has been presented to show a general characterization of the receiving water quality. However, as this data was obtained from sites outside of the LAR UR2 WMA, it does not reflect the water quality conditions caused by the LAR UR2 WMA.

Table 2-2 Summary of Exceedances for All Five Year and Ten Year Data Set

Constituent	10 Year (2002-2012)					5 Year (2007 - 2012)				
	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed
TMDL										
E. coli	0	0	0	0%	0%	0	0	0	0%	0%
Copper	149	146	51	98%	34%	112	109	33	97%	29%
Lead	149	148	16	99%	11%	112	111	12	99%	11%
Zinc	149	149	25	100%	17%	112	112	19	100%	17%
Ammonia	50	42	0	84%	0%	42	35	0	83%	0%
CWA 303(d) List										
Total Coliform	75	75	56	100%	75%	38	38	26	100%	68%
Fecal Coliform	75	74	59	99%	79%	38	37	27	97%	71%
Oil and Grease	75	39	39	52%	52%	38	22	22	58%	58%
Basin Plan, CTR, MS4 Permit Water Quality Objective Exceedance										
Fecal Enterococcus	75	73	65	97%	87%	38	36	31	95%	82%
Cyanide	75	57	4	76%	5%	38	29	0	76%	0%
Dissolved Oxygen	74	74	1	100%	1%	38	38	0	100%	0%
pH	75	75	14	100%	19%	38	38	9	100%	24%
Chemical Oxygen Demand	75	74	1	99%	1%	38	37	0	97%	0%
Chloride	79	79	1	100%	1%	42	42	0	100%	0%
Kjeldahl-N	79	79	18	100%	23%	42	42	9	100%	21%
Nitrite-N	79	50	6	63%	8%	42	25	0	60%	0%
Nitrogen - Total	4	4	3	100%	75%	4	4	3	100%	75%
Phosphorus - Total (as P)	78	77	10	99%	13%	42	41	4	98%	10%
Total Suspended Solids	82	82	30	100%	37%	45	45	16	100%	36%
Cadmium	79	45	5	57%	6%	42	34	3	81%	7%
Chromium	79	77	9	97%	11%	42	40	6	95%	14%
Mercury	79	6	2	8%	3%	42	5	1	12%	2%
Nickel	79	77	6	97%	8%	42	40	3	95%	7%

Table 2-3 Ten Year (2002 – 2012) Comparison of Exceedances during Wet- and Dry-Weather

Constituent	10-Year Wet-Weather					10-Year Dry-Weather				
	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed
TMDL										
E. coli	0	0	0	0%	0%	0	0	0	0%	0%
Copper	49	47	37	96%	76%	100	99	14	99%	14%
Lead	49	49	11	100%	22%	100	99	5	99%	5%
Zinc	49	49	25	100%	51%	100	100	0	100%	0%
Ammonia	29	25	0	86%	0%	21	17	0	81%	0%
CWA 303(d) List										
Total Coliform	49	49	49	100%	100%	26	26	7	100%	27%
Fecal Coliform	49	49	48	100%	98%	26	25	11	96%	42%
Oil and Grease	49	37	37	76%	76%	26	2	2	8%	8%
Other										
Fecal Enterococcus	49	49	49	100%	100%	26	24	16	92%	62%
Cyanide	49	34	2	69%	4%	26	23	2	88%	8%
Dissolved Oxygen	48	48	1	100%	2%	26	26	0	100%	0%
pH	49	49	2	100%	4%	26	26	12	100%	46%
Chemical Oxygen Demand	49	48	1	98%	2%	26	26	0	100%	0%
Chloride	49	49	1	100%	2%	30	30	0	100%	0%
Kjeldahl-N	49	49	15	100%	31%	30	30	3	100%	10%
Nitrite-N	49	26	0	53%	0%	30	24	6	80%	20%
Nitrogen - Total	0	0	0	0%	0%	4	4	3	100%	75%
Phosphorus - Total (as P)	48	48	8	100%	17%	30	29	2	97%	7%
Total Suspended Solids	56	56	29	100%	52%	26	26	1	100%	4%
Cadmium	49	31	5	63%	10%	30	14	0	47%	0%
Chromium	49	48	8	98%	16%	30	29	1	97%	3%
Mercury	49	1	1	2%	2%	30	5	1	17%	3%
Nickel	49	48	5	98%	10%	30	29	1	97%	3%

Table 2-4 Five Year (2007 – 2012) Comparison of Exceedances during Wet- and Dry-Weather

Constituent	5 year Wet-Weather					5 year Dry-Weather				
	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed
TMDL										
E. coli	0	0	0	0%	0%	0	0	0	0%	0%
Copper	24	22	22	92%	92%	88	87	11	99%	13%
Lead	24	24	7	100%	29%	88	87	5	99%	6%
Zinc	24	24	19	100%	79%	88	88	0	100%	0%
Ammonia	24	21	0	88%	0%	18	14	0	78%	0%
CWA 303(d) List										
Total Coliform	24	24	24	100%	100%	14	14	2	100%	14%
Fecal Coliform	24	24	23	100%	96%	14	13	4	93%	29%
Oil and Grease	24	20	20	83%	83%	14	2	2	14%	14%
Other										
Fecal Enterococcus	24	24	24	100%	100%	14	12	7	86%	50%
Cyanide	24	17	0	71%	0%	14	12	0	86%	0%
Dissolved Oxygen	24	24	0	100%	0%	14	14	0	100%	0%
pH	24	24	0	100%	0%	14	14	9	100%	64%
Chemical Oxygen Demand	24	23	0	96%	0%	14	14	0	100%	0%
Chloride	24	24	0	100%	0%	18	18	0	100%	0%
Kjeldahl-N	24	24	7	100%	29%	18	18	2	100%	11%
Nitrite-N	24	13	0	54%	0%	18	12	0	67%	0%
Nitrogen - Total	0	0	0	0%	0%	4	4	3	100%	75%
Phosphorus - Total (as P)	24	24	4	100%	17%	18	17	0	94%	0%
Total Suspended Solids	31	31	16	100%	52%	14	14	0	100%	0%
Cadmium	24	20	3	83%	13%	18	14	0	78%	0%
Chromium	24	23	6	96%	25%	18	17	0	94%	0%
Mercury	24	0	0	0%	0%	18	5	1	28%	6%
Nickel	24	23	3	96%	13%	18	17	0	94%	0%

Table 2-5 Summary of Exceedances for Los Angeles River and Rio Hondo (2002 – 2012)

Constituent	Los Angeles River					Rio Hondo				
	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed	Total Samples	Number Detects	Number Exceed	% Detect	% Exceed
TMDL										
E. coli	0	0	0	0%	0%	0	0	0	0%	0%
Copper	123	120	35	98%	28%	26	26	16	100%	62%
Lead	123	122	10	99%	8%	26	26	6	100%	23%
Zinc	123	123	24	100%	20%	26	26	1	100%	4%
CWA 303(d) List										
Total Coliform	63	63	46	100%	73%	12	12	10	100%	83%
Fecal Coliform	63	62	48	98%	76%	12	12	11	100%	92%
Oil and Grease	63	34	34	54%	54%	12	5	5	42%	42%
Other										
Fecal Enterococcus	63	61	54	97%	86%	12	12	11	100%	92%
Cyanide	63	50	1	79%	2%	12	7	3	58%	25%
Dissolved Oxygen	62	62	1	100%	2%	12	12	0	100%	0%
pH	63	63	12	100%	19%	12	12	2	100%	17%
Chemical Oxygen Demand	63	62	1	98%	2%	12	12	0	100%	0%
Chloride	63	63	0	100%	0%	16	16	1	100%	6%
Kjeldahl-N	63	63	13	100%	21%	16	16	5	100%	31%
Nitrite-N	63	43	6	68%	10%	16	7	0	44%	0%
Nitrogen - Total	0	0	0	0%	0%	4	4	3	100%	75%
Phosphorus - Total (as P)	63	62	9	98%	14%	15	15	1	100%	7%
Total Suspended Solids	70	70	24	100%	34%	12	12	6	100%	50%
Cadmium	63	39	5	62%	8%	16	6	0	38%	0%
Chromium	63	61	9	97%	14%	16	16	0	100%	0%
Mercury	63	3	2	5%	3%	16	3	0	19%	0%
Nickel	63	61	6	97%	10%	16	16	0	100%	0%

2.1.2 Characterization of Discharge Quality

Stormwater and non-stormwater discharges would be characterized if sufficient existing data were available. The necessary data is limited due to the typical lack of data for MS4 discharges within the LAR UR2 WMA and other Los Angeles County WMAs. Regional studies, modeling data, and/or land use data will be further evaluated in the future in order to characterize discharge quality. In addition, data will become available through the future Coordinate Integrated Monitoring Program (CIMP) Outfall Monitoring which will be utilized to characterize discharges from the LAR UR2 WMA.

2.2 Water Body Pollutant Classification

Based on the findings from the water quality characterization, the WBPCs can be classified into one of three categories, in accordance with the MS4 Permit Part VI.5.a.ii. Those WBPCs with a TMDL were classified as Category 1, those WBPCs listed on the State's 303(d) list as impairing a particular waterbody segment were classified as Category 2, and those remaining WBPCs without an associated TMDL or on the State's 303(d) list, but showing exceedances of water quality criteria were classified as Category 3. This categorization is intended to prioritize WBPCs in order to guide the implementation of structural and non-structural control measures in this WMP as well as the CIMP development. A classification of the constituents into each category was prepared and is summarized in **Table 2-6**. Category 3 pollutants were not identified for LAR UR2 WMA because all available water quality data was obtained downstream of LAR UR2 WMA, therefore its applicability is unknown. Through CIMP monitoring efforts, applicable data will be obtained and WBPCs will be revised through the adaptive management process.

Table 2-6 Categorized Water Body-Pollutant Combinations

Category 1 (TMDL)	Category 2 (303(d) List)
Ammonia-Nitrogen Nitrate-Nitrogen Nitrite-Nitrogen Nitrate-Nitrogen Plus Nitrite-Nitrogen *E. coli* Bacteria Cadmium Copper Lead Zinc Trash	Oil Coliform Bacteria Toxicity

2.3 Source Assessment

After the WBPC classification analysis, a source assessment, as outlined in MS4 Permit Part VI.C.5.a.iii, for LAR UR2 WMA Category 1 through 3 pollutants is warranted to identify whether MS4 discharges are likely to be causing or contributing to the impairments or exceedances. The assessment criteria may be based on the following facts or findings:

- Findings from LAR UR2 WMA Illicit Connections and Illicit Discharge Elimination Programs;
- Findings from LAR UR2 WMA Industrial/Commercial Facilities Programs;
- Findings from LAR UR2 WMA Development Construction Programs;
- Findings from LAR UR2 WMA Public Agency Activities Programs;
- TMDL source investigations;
- Watershed model results;

- Findings from LAR UR2 WMA monitoring programs, including but not limited to TMDL compliance monitoring and receiving water monitoring; and
- Any other pertinent data, information, or studies related to pollutant sources and conditions that contribute to the highest water quality priorities.

Monitoring data from non-MS4 Permittees in the LAR UR2 WMA was also reviewed. The result of this analysis is summarized in the following sections.

Bacteria

The Los Angeles River Watershed Bacteria TMDL asserted the following regarding the identification of indicator bacteria sources to the Los Angeles River:

> *Dry-weather urban runoff and stormwater conveyed by storm drains are the primary sources of elevated bacterial indicator densities to the Los Angeles River Watershed during dry- and wet-weather. The linkage between the numeric targets and the allocations is supported by the following scientific findings:*
>
> 1. *In Southern California, in dry-weather, local sources of bacteria principally drive exceedances (LARWQCB, 2002b; 2003b; 2004a).*
> 2. *Tiefenthaler et al. found that in natural streams bacteria levels were generally higher during lower flow condition (Tiefenthaler et al., 2008).*
> 3. *Ackerman et al. found that storm drains contribute roughly 13 percent of the flow in the Los Angeles River in dry-weather, while Water Reclamation Plants (WRPs) account for roughly 72 percent of the flow in the river during dry-weather. With this flow, storm drains were contributing almost 90 percent of the E. coli loading (Ackerman et al., 2003). E. coli concentrations were found to be as much as four orders of magnitude higher from storm drains than from the WRP discharges.*
> 4. *In the BSI study, the CREST team found that approximately 85 percent of the storm drain samples collected exceeded the E. coli objective. In the reaches investigated, E. coli loading from storm drains and tributaries greatly exceeded the allowable instream loading. The study also found that some of the loading in Reach 2 could not be attributed to the measured storm drain inputs.*
> 5. *In Southern California, in wet-weather, upstream or watershed sources principally cause the bacteria exceedances (LARWQCB, 2002b; 2003c; 2004a).*
> 6. *During wet-weather, WRP discharges may account for as little as 1 percent of the total flow in the river (CREST, 2009a).*
> 7. *Based on three experiments conducted by Noble et al. (1999) to mimic natural conditions in or near Santa Monica Bay (SMB), two in marine water and one in fresh water, bacteria degradation was shown to range from hours to days (Noble et al., 1999). Based on the results of the marine water experiments, the model assumes a first-order decay rate for bacteria of 0.8 d-1 (or 0.45 per day). Degradation rates were shown to be as high as 1.0 d-1 (Noble et al., 1999). These studies show that bacterial degradation and dilution during transport through the watershed do not significantly affect bacterial indicator densities in receiving waters.*

Based on this finding, further source assessment of the MS4 discharges will need to be conducted to determine the primary source of bacteria within MS4 of the LAR UR2 WMA.

Metals

The Los Angeles River Metals TMDL CMP stated the following regarding sources of metals to MS4 discharges:

> *There are significant differences in the sources of metals loadings during dry-weather and wet-weather. During dry-weather, most of the metals loadings are in the dissolved form. The three major publicly owned treatment works (POTWs) that discharge to the river (Tillman WRP, LA-Glendale WRP, and Burbank WRP) constitute the majority of the flow and metals loadings during dry-weather. The storm drains also contribute a large percentage of the loadings during dry-weather because although their flows are typically low, concentrations of metals in urban runoff may be quite high. The remaining portion of the dry-weather flow and metals loadings represents a combination of tributary flows, groundwater discharge, and flows from other permitted NPDES discharges within the watershed.*
>
> *During wet-weather, most of the metals loadings are in the particulate form and are associated with wet-weather stormwater flow. On an annual basis, stormwater contributes about 40 percent of the cadmium loading, 80 percent of the copper loading, 95 percent of the lead loading and 90 percent of the zinc loading. This stormwater flow is permitted through two MS4 permits, a separate Caltrans MS4 permit, a general construction stormwater permit and a general industrial stormwater permit.*
>
> *Nonpoint sources of metals may include tributaries that drain the open space areas of the watershed. Direct atmospheric deposition of metals on the river is also a small source. Indirect atmospheric deposition on the land surface that is washed off during storms is a larger source, which is accounted for in the estimates of stormwater loadings.*

Nitrogen Compounds, pH, and Phosphorous

The Los Angeles River Nitrogen Compounds and Related Effects TMDL asserted that the principal sources of nitrogen compounds to the Los Angeles River were:

> *The principal source of nitrogen compounds to the Los Angeles River is discharges from the Donald C. Tillman WRP, the Los Angeles-Glendale WRP, and the Burbank WRP. During dry-weather period, the major POTWs contribute 84.1 percent of the total dry-weather nitrogen load. Urban runoff, stormwater, and groundwater discharge may also contribute nitrate loads. Further evaluation of these sources is set forth in the Implementation Plan.*

Trash, Oil, Grease, and Sediments

The Trash TMDL for the Los Angeles River Watershed asserted the following in the source analysis section of the technical TMDL:

> *The major source of trash in the river results from litter, which is intentionally or accidentally discarded in watershed drainage areas. Transport mechanisms include the following:*
>
> 1. *Storm drains: trash is deposited throughout the watershed and is carried to the various reaches of the river and its tributaries during and after significant rainstorms through storm drains.*
> 2. *Wind action: trash can also blow into the waterways directly.*
> 3. *Direct disposal: direct dumping also occurs.*

Extensive research has not been done on trash generation or the precise relationship between rainfall and its deposition in waterways. However, it has been found that the amount of gross pollutants entering the stormwater system is rainfall dependent but does not necessarily depend on the source (Walker and Wong, December 1999). The amount of trash which enters the stormwater system depends on the energy available to re-mobilize and transport deposited gross pollutants on street surfaces rather than on the amount of available gross pollutants deposited on street surfaces. The exception to this finding of course would be in the event that there is zero gross pollutants deposited on the street surfaces or other drainages tributary to the storm drain.

Where gross pollutants exist, a clear relationship between the gross pollutant load in the stormwater system and the magnitude of the storm event has been established. The limiting mechanism affecting the transport of gross pollutants, in the majority of cases, appears to be remobilization and transport processes (i.e., stormwater rates and velocities).

Several studies conclude that urban runoff is the dominant source of trash. The large amount of trash conveyed by urban stormwater to the Los Angeles River is evidenced by the amount of as trash that accumulates at the base of storm drains. The amount and type of trash that is washed into the storm drain system appears to be a function of the surrounding land use.

While this assessment may have been correct several years ago, the LAR UR2 WMA were recipients of a grant that resulted in full capture certified devices being placed where ever possible within the jurisdictions. Most of the cities are 90 percent or more compliant with the trash TMDL and are investigating opportunities to complete this implementation effort.

2.4 Prioritization

MS4 Permit Part VI.C.5.a.iv, directs Permittees to identify the water quality priorities within each WMA. At a minimum, these priorities shall include: 1) Achieving applicable WQBELs and/or RWLs established pursuant to TMDLs, as set for in the MS4 Permit Part VI.E and Attachment O for the LAR UR2 WMA. The MS4 Permit listed water quality priorities are as follows:

- **Priority 1(a)** – TMDLs controlling pollutants for which there are WQBELs and/or RWL with interim or final compliance deadlines within the permit term or TMDL compliance deadlines that have already passed and limitations have not been achieved.
- **Priority 1(b)** – TMDLs controlling pollutants for which the WQBELs and/or RWL with interim or final compliance deadlines between September 6, 2012 and October 25, 2017.
- **Priority 2** – All other controlling pollutants for which data indicate impairment or exceedances of RWL in the receiving water and the findings from the source assessment implicates discharges from the MS4 shall be considered the second highest priority.

Table 2-7 lists the identified water quality priorities and the WBPCs categories based on compliance deadlines.

Table 2-7 LAR UR2 WMA Water Quality Priorities

Priority	Pollutant	Category	Water Body		Compliance Deadline
			Los Angeles River Reach 2	Rio Hondo Reach 1	
1a	Ammonia (NH_3-N)	1	x	x	March 23, 2004
	Nitrate (NO_3-N)	1	x	x	March 23, 2004
	Nitrite (NO_2-N)	1	x	x	March 23, 2004
	NO_3-N+NO_2-N	1	x	x	March 23, 2004
1b	Trash	1	x	x	September 30, 2016 (effectively 10/1/15)
2	*E.coli* Dry-Weather	1	x	x	March 23, 2022 (Group Interim Single sample Final WQBEL)
	Copper Dry-Weather	1	x	x	January 11, 2024
	Lead Dry-Weather	1	x	x	January 11, 2024
	Zinc Dry-Weather	1		x	January 11, 2024
	Copper Wet-Weather	1	X	x	January 11, 2028
	Lead Wet-Weather	1	X	x	January 11, 2028
	Zinc Wet-Weather	1	X	x	January 11, 2028
	Cadmium Wet-Weather	1	X	x	January 11, 2028
	E.coli Wet-Weather	1	X	x	March 23, 2037
	Oil	2	X		N/A
	Coliform Bacteria	2		x	N/A
	Toxicity	2		x	N/A
	Fecal Enterococcus	3	x	x	N/A
	pH	3	x	x	N/A
	Kjeldahl-N	3	x	x	N/A
	Total Nitrogen	3		x	N/A
	Total Phosphorus - P	3	x		N/A
	Total Suspended Solids	3	x		N/A
	Cadmium	3	x		N/A
	Chromium	3	x		N/A
	Nickel	3	x		N/A

3. Watershed Control Measures

Permit Part VI.C.5.b is titled *Selection of Watershed Control Measures* and directs Permittees to *identify strategies, control measures and BMPs ... with the goal of creating an efficient program to focus individual and collective resources on watershed priorities*. This section further identifies retrofitting of existing development and modification of Permit identified MCMs. The permit apparently introduces this verbiage as catch all for the many ways in which runoff and pollutants from a watershed can be reduced.

3.1 MCMs and Institutional BMPs

MS4 Permit Part VI.C.5.b.iv.(1) directs that the MCMs identified in Parts VI.D.4 to VI.D.10 be incorporated as part of the WMP Plan. The placement of this reference section within the WMP portion of the permit (Part VI.C) allows the MCMs in the subsequent section (IV.D) to be assessed for potential effectiveness and even modified to emphasize the pollution control priorities identified within the WMP Plan. Part VI.C.5.b.iv.(1).(c) explicitly allows some MCM sections to be deleted, and wholly replaced, when accompanied by appropriate justification. The general MCMs categories identified in Part VI.C of the MS4 Permit include the following:

i. Development Construction Program
ii. Industrial/Commercial Facilities Program
iii. Illicit Connection and Illicit Discharges (IC/ID) Detection and Elimination Program
iv. Public Agency Activities Program
v. Public Information and Participation Program (PIPP)

3.1.1 MCM Programs and Potential Modifications

The following subsections provide an overview of the MS4 Permit requirements associated with each of the MCMs, including the Planning and Land Development Program which cannot be modified. The MCM programs and corresponding MS4 Permit Parts are outlined as follows:

- Public Information and Participation Program (Part VI.D.5)
- Industrial/Commercial Facilities Program (Part VI.D.6)
- Planning and Land Development Program (Part VI.D.7)
- Development and Construction Program (Part VI.D.8)
- Public Agency Activities Program (Part VI.D.9)
- Illicit Connections and Illicit Discharges Detection and Elimination Program (Part VI.D.10)

Additional details regarding the enhancements that will be implemented by the LAR UR2 WMA are presented in **3.3.1**.

3.1.1.1 Public Information and Participation Program

Since adoption of the first Los Angeles County MS4 Permit in 1990, PIPPs have been the most visible and important component of the stormwater quality protection program for the average Los Angeles County resident. The PIPP is introduced in Part VI.D.5 of the MS4 Permit with the following objectives:

1) Measurably increase target audience knowledge about the MS4, stormwater pollution, the impact of stormwater pollution on receiving waters, and solutions to mitigate the impact of stormwater;
2) Measurably change the waste disposal and pollution generating behavior of target audiences by encouraging implementation of alternatives by distributing educational material; and

3) Involve and engage socio-economic groups and ethnic communities in mitigating stormwater impacts.

The PIPP MCM objectives must be achieved by participating in a County, WMP, or Permittee led program. Permittees may maintain the existing 888-CLEANLA hotline for reporting spills, clogged catch basins, faded PIPP markers, and identify staff/department responsible for receiving such reports, or establish similar new Watershed Management Area or Permittee specific hotlines and reporting websites. Permittees must also individually or collectively participate in public outreach events to raise community awareness regarding stormwater and urban runoff. Example events include Beach and River Clean-Up Days coordinated with Heal the Bay and the Los Angeles County Waterkeeper, the Los Angeles County Fairs, Electronic Recycling and community Household Hazardous Waste Collection (HHWC) events.

There must also be a residential outreach program to develop public service announcements and advise the public about appropriate handling and disposal of hazardous materials and animal wastes. During prior permit cycles, Permittees contributed to developing and purchasing print advertisements, movie trailers, mobile billboards, and advertisement spots during Dodger Baseball games. A "Point of Purchase" education or brochure distribution program must also be developed for display at automotive part, home improvement and gardening, pet, and feed stores. Permittees are also directed to have, or share; websites with educational materials along with educational programs based on the State's Erase the Waste and California Environmental Education Interagency Network (CEEIN) program.

Together these ongoing PIPP MCM efforts can be expected to continue to contribute to reducing the discharge of pollutants, educating the public about how to better implement LID opportunities during their home improvement projects, and generally improving the local and regional environment. For the LAR UR2 WMA, this is especially true as it relates to pet wastes which are likely to remain a predominant watershed source of indicator bacteria such as *E. coli*, which are likely to remain the most significant long term watershed pollutant priority. As in past permit cycles, a well supported and thoughtfully directed PIPP program, focused on bacteria and fecal wastes as a priority within the LAR UR2 WMA, should reach over 50% of the community with multiple impact opportunities per year, which can then be easily and substantially quantified as part of the annual report process. This program could focus on the proper disposal of dog and cat excrement, with linkages back to human and wildlife (e.g., Sea Otter) diseases such as toxoplasmosis with reputable supporting information provide by aquariums (Science Daily, 2002) and Health Departments (Los Angeles County, 2012). The potential modifications to this MCM are presented so that they may be referenced in the future during the adaptive management process. The program modifications incorporated through the WMP are documented in **Section 3.3.1**.

3.1.1.2 Industrial/Commercial Facilities Program

As required by Part VI.D.6 of the MS4 Permit, each Permittee must implement an industrial and commercial facilities program designed to prevent illicit discharges into the MS4, reduce runoff from these facilities to the MEP standard, and prevent their discharges from contributing to violations of receiving water limitations. At a minimum this program must:

1) Track critical industrial and commercial sources using a GIS based inventory and database;
2) Implement a Business Assistance Program to educate them about reducing pollutants in runoff;
3) Conduct inspections of Critical Commercial Sources to ensure effective BMP implementation;
4) Inspect and progressively enforce Critical Source and General Industrial Permit compliance; and
5) Verify the implementation of the Commercial and Industrial Source Control BMPs identified on Table 10 (page 93 and 94) of the MS4 Permit.

This MCM program has the potential to significantly reduce stormwater conveyed pollutant loadings, especially within the more industrialized areas of the LAR UR2 WMA. The potential modifications to this

MCM are presented so that they may be referenced in the future during the adaptive management process. The program modifications incorporated through the WMP are documented in **3.3.1**. This program may provide the clearest example of a cost effective MCM modification. One example would be a State led effort to educate General Industrial Permittees about their anticipated responsibilities to comply with TMDL WLAs under the proposed draft General Industrial Permit. As detailed in **Section 4.3.2.1**, as industrial land use loadings are reduced to comply with general permit requirements, the LAR UR2 WMA RAA demonstrates significant reductions in key land use based pollutant loadings, such as trash, metals and bacteria (*E. coli*). Furthermore, as these facilities expand their monitoring effort to address these problematic pollutants, it should become easier to share the information with the MS4 Permittees and focus the education and Business Assistance Program on the more problematic facilities that have a true contribution to observed receiving water and (public or private) outfall exceedances. While enforcement should not be an immediate priority, more recalcitrant or negligent facilities could also be targeted for limited cost-effective (e.g. bacteria and metal) monitoring that can contribute to permit required coordination with State enforcement efforts. The impact of this program could be uneven across the LAR UR2 WMA, as most of the industrial sites are in the Cities of Vernon and Commerce, but each Permittee has significant areas of critical commercial source facilities such as retail gasoline outlets, restaurants, nurseries, and automotive repair shops.

3.1.1.3 Planning and Land Development Program

The Planning and Land Development Program in MS4 Permit Part VI.D.7 is probably the most complicated section of the current Permit. In the 2012 MS4 Permit this part continues to implement, expand, and quantify the SUSMP program. It also defines hydromodification controls that are expected to have little impact on the LAR UR2 WMA Permittees, as it is only applicable to projects located within natural drainage systems. The section contains specific BMP design criteria, as well as implementation priorities that may be subject to interpretation at the planning level and annually documented. The stated purposes or objectives of this permit section include:

1) Encouraging Smart Growth and urban redevelopment to protect environmentally sensitive areas;
2) Protecting natural drainage systems (limited applicability to the LAR UR2 WMA);
3) Minimize imperviousness through LID and runoff retention or use;
4) Maintain and enhance riparian buffer areas (limited applicability to the LAR UR2 WMA);
5) Minimize pollutant loads, from impervious surfaces, through appropriate BMP/LID technologies;
6) Properly design and maintain LID and BMP control pollutants and reduce changes in hydrology;
7) Prioritize BMP selection to remove pollutants, reduce runoff, and support integrated water management by first using on-site infiltration, bioretention, and rainfall harvesting, then secondarily utilizing on-site biofiltration, off-site replenishment and retrofit opportunities.

Typical redevelopment rates released by the City of Los Angeles (City of Los Angeles Bureau of Sanitation, 2009) assume complete or substantial building replacement at an annual rate of between two and five percent, meaning that a particular parcel is likely to be redeveloped every twenty to fifty years on average. Assuming typical interpretations of permit requirements, which would exclude residential redevelopments of less than an acre in area from the significant program requirements, this program is most likely to produce water quality improvements in industrial or commercial land use areas, rather than cities with more residential characteristics. Extrapolating current redevelopment rates will help quantify the impact of this program over time.

3.1.1.4 Development and Construction Program

Implementation of a Development Construction Program is required under the MCM identified in MS4 Permit Part VI.D.8, with subparts directed at projects both less than, and greater than, one acre in extent. Permittees are required to implement a construction program with the following objectives:

1) Prevent the discharge of illicit construction-related pollutants into the MS4 and receiving waters;
2) Implement and maintain structural and non-structural BMPs to reduce pollutants in site runoff;
3) Prevent construction site discharges from causing or contributing to receiving water limitations;
4) Reduce construction site discharges of pollutants to the MS4 to the MEP standard; and
5) Establish an enforceable erosion/sediment control ordinance for soil disturbing construction sites.

MS4 Permit Part VI.D.8.d and Table 12 from the MS4 Permit apply exclusively to construction projects of less than one acre in extent and generally require the use of tracking and good housekeeping practices that are suitably implemented through typical municipal building and safety inspection programs. With the exception of concluding MS4 Permit Parts regarding enforcement and staff training, the remainder of this Part applies to construction sites of greater than, or equal to, one acre. Therefore, it significantly complements and documents implementation and competent tracking of the State General Construction Permit requirements, with Tables 13 through 17 of the MS4 Permit identifying specific BMP implementation and inspection requirements. Since this MS4 Permit Part addresses the construction phase of development/redevelopment, estimates of pollution reduction can be expected to vary annually and are only applicable in the year of occurrence. However the reduction in pollution generation, especially for suspended solids and trash, can be significant and far greater than generation rates found on adjacent similarly sized occupied parcels. Potential modifications to this program are not identified, as they are unpredictable and vary over time.

3.1.1.5 Public Agency Activities Program

MS4 Permit Part VI.D.9 identifies the Public Agency Activities Program MCM, which is directed at Permittees, their facilities, and maintenance operations. In previous MS4 Permits, the objectives of this program element were sometimes referred to as municipal "good housekeeping" practices, but they continue to evolve and have become significant municipal implementation efforts on their own. They include:

1) Public Construction Activities Management;
2) Public Facility Inventory;
3) Inventory of Existing Development for Retrofitting Opportunities;
4) Public Facility and Activity Management;
5) Vehicle and Equipment Wash Areas;
6) Landscape, Park, and Recreational Facilities Management;
7) Storm Drain Operation and Maintenance;
8) Streets, Roads and Parking Facilities Maintenance;
9) Emergency Procedures; and
10) Municipal Employee and Contractor Training.

The potential modifications to this MCM are presented so that they may be referenced in the future during the adaptive management process. The program modifications incorporated through the WMP are documented in **Section 3.3.1**. More frequent street cleaning, will enhance compliance with the Los Angeles River Trash TMDL, while street vacuuming in land use areas that generate high metals loads can also have significant positive results. Enhanced maintenance of catch basins, especially those containing connector pipe screens, may result in reduced bacteria loadings that are likely to be significant priority in this region. The cost and pollution reduction effectiveness of this MCM program would likely be linked to the measures necessary to achieve RAA water quality objectives in the most cost effective and implementable WMP plan manner.

3.1.1.6 Illicit Connections and Illicit Discharges Elimination Program

Permit Part VI.D.10 expands the IC/ID program by substantially formalizing elements of the extant Permittee effort. Program formalization steps include the following:

1) Develop written procedures for conducting source investigations;
2) Develop written procedures for eliminating the source of illicit connections and illicit discharges;
3) Develop written procedures for public reporting of illicit discharges;
4) Develop written Spill Response Plans (SRPs); and
5) Educate employees, businesses, and the public about the hazards of illegal discharges and improper waste disposal.

The potential modifications to this MCM are presented so that they may be referenced in the future during the adaptive management process. The program modifications incorporated through the WMP are documented in **Section 3.3.1**. Ordinances with consistent enforcement actions, which include accelerated follow up times may be beneficial. Reducing the amount of days for the follow up inspection will ensure prompt clean up.

3.1.2 Summary of Existing MCMs/Institutional BMPs

The existing MCMs/institutional BMPs within the LAR UR2 WMA were evaluated and summarized based on the Los Angeles County Unified Annual Stormwater Reports for the Fiscal Years 2010-2011 and 2011-2012. Tables summarizing the existing MCMs/institutional BMPs by LAR UR2 WMA are presented in **Appendix E**.

3.1.3 Non-Stormwater Discharge Control Measures

Part VI.C.5.b.iv.(2) of the MS4 Permit states that where Permittees identify non-stormwater discharges from the MS4 as a source of pollutants that cause or contribute to exceedance of RWLs, the proposed watershed control measures must include strategies, control measures, and/or BMPs that must be implemented to effectively eliminate the source of pollutants consistent with Parts III.A and VI.D.10 of the MS4 Permit. These may include measures to prohibit the non-stormwater discharge to the MS4, additional BMPs to reduce pollutants in the non-stormwater discharge or conveyed by the non-stormwater discharge, diversion to a sanitary sewer for treatment, or strategies to require the non-stormwater discharge to be separately regulated under a general NPDES Permit.

Among others, the Rio Hondo has been successful in controlling non-stormwater discharges and the channel is often either dry or lacks runoff flows. It is likely that efforts to control irrigation overspray and reduce outdoor water use will continue to benefit the LAR UR2 WMA Permittees. This combined with the non-stormwater outfall based inventory; screening and source assessment will be the group's initial focus for the next round of source control measures.

3.1.4 TMDL Control Measures

Part VI.C.5.b.iv.(3) of the MS4 Permit states that Permittees must compile control measures that have been identified in TMDLs and corresponding implementation plans. In addition, Permittees must identify those control measures to be modified, if any, to most effectively address TMDL requirements within the watershed. If TMDL implementation plans have not been developed, Permittees must include control measures (baseline or modified) that will address both stormwater and non-stormwater discharges from the MS4s to ensure compliance with applicable TMDLs. This section identifies and summarizes TMDL

implementation plans that have been developed by the LAR UR2 WMA members in response to applicable TMDLs. Proposed modifications to these control measures are presented in **Section 3.3.3**

3.1.5 TMDL Implementation Plans

TMDL implementation plans have not been developed for any of the applicable TMDLs except for the Los Angeles River Metals TMDL. Implementation plans were not required, and moving forward, this WMP will serve as the implementation plan for all applicable TMDLs. The implementation plan corresponding to the Los Angeles River Metals TMDL is reviewed and summarized below in order to identify the TMDL control measures previously identified.

3.1.5.1 Los Angeles River Metals TMDL Implementation Plans

In compliance with the implementation schedule set forth in the Los Angeles River Metals TMDL, Permittees and groups of Permittees completed an implementation plan. The Final Implementation Plan for Reach 2 Participating Jurisdictions was approved on October 11, 2010 and among the submitting jurisdictions were the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon. This plan identifies a phased implementation for non-structural BMPs that starts in 2010 and ends in 2028. The schedule is provided in **Table 3-1**.

Table 3-1 LAR Metals TMDL Jurisdictional Group 2 Non-Structural BMPs Phased Implementation Plan

BMP	Phase 1 (2010-2011)	Phase 2 (2012-2019)	Phase 3 (2020-2023)	Phase 4 (2024-2028)
Vehicle Brake Pad Replacement	Senate Bill 346 into law September 27, 2010	Support Implementation activities		
Tire Wheel Weight Replacement	Support legislative efforts for passage of Senate Bill 757	No new activity (assumes legislative success by 2012)		
Pesticide Use	No activity	Evaluate potential for action and implement as needed by end of Phase 3		No new activity
Vehicle Tire Wear Reduction	No activity	Evaluate potential for action and implement as needed by end of Phase 3		No new activity
Roof Materials Control	Implement building and planning agency coordination activities; evaluate need for ordinance/revised specifications	Establish and implement as needed ordinance and/or revised specifications; implement downspout disconnect program	No new activity	
Street Sweeping	No new activity - continue to implement at current level	Evaluate existing program to identify opportunities to increase efficiency		No new activity
Catch Basin Cleaning	No new activity - continue to implement at current level	Evaluate existing program to identify opportunities to increase efficiency		No new activity
Public Education and Outreach	Evaluate and revise public education and outreach materials/programs as needed to focus on metals	Continue to review and revise as needed		
Water Conservation	Develop water conservation model ordinance	Establish ordinance by end of Phase 3		No new activity
Development Practices	Establish model requirements that reduce offsite runoff consistent with future MS4 Permit expectations	Revise MS4 program as needed and implement new practices; update as needed over long term to incorporate new concepts or methods		
Downspout Disconnect Program[1]	Establish program for implementation	Implement downspout disconnects at rate determined by Phase 1 structural BMP selection	Implement downspout disconnects at rate determined by Phase 1 structural BMP selection	Implement downspout disconnects at rate determined by Phase 1 structural BMP selection
General Plan Update	Identify areas for revision and establish schedule for implementation	Revise General Plan by end of Phase 3		No new activity
Watershed Coordination	Review existing coordination; identify improved mechanisms and implement	Continue high level of coordination		

[1] The number of downspout disconnections implemented in Reach 2 watershed is dependent on the number of structural BMPs implemented. The rate of implementation needed will be determined during Phase 1.

Note: Each jurisdiction will select from the phased non-structural BMP programs as outlined in Table ES-4 of the Final Implementation Plan for Reach 2 Participating Jurisdictions.

3.2 Structural BMPs

As part of the WMP development process, BMPs that will be considered sufficient in addressing water quality priorities and achieving compliance with MS4 Permit requirements were identified. Structural BMPs vary in function and type, with each BMP providing unique design characteristics and benefits from implementation. The overarching goal of BMP implementation as part of the WMP is to reduce the impact of stormwater and non-stormwater flows on receiving water quality. This section identifies structural BMPs that are currently implemented, as well as potential BMPs that may be used in the future. The structural BMPs proposed in accordance to this WMP are identified in **Section 3.3.3**.

3.2.1 Categories of Structural BMPs

Structural BMPs include both regional and distributed BMPs categorized as illustrated in **Table 3-2**. This section provides detailed descriptions of various regional and distributed BMPs that were considered for use by the LAR UR2 WMA and may be considered in the future through the adaptive management process. The structural BMPs proposed through this WMP are identified in **Section 3.3.3**. Additionally, **Appendix F** provides a comparison matrix which ranks different BMP types for different ranking factors that include cost, effectiveness, implementation, and environmental/other factors.

Table 3-2 Summary of Structural BMP Categories and Major Functions

Category	Subcategory	Example BMP Types
Regional	Infiltration	Surface infiltration basin, subsurface infiltration gallery
	Detention	Surface detention basin, subsurface detention gallery
	Constructed Wetland	Constructed wetland, flow-through/linear wetland
	Treatment Facility	Facilities designed to treat runoff from and return it to the receiving water
	Low Flow Diversion	Facilities designed to divert dry-weather flows to the sanitary sewer
Distributed	Site-Scale Detention	Dry detention basin, wet detention pond, detention chambers, etc.
	Green Infrastructure	**Bioretention** and **biofiltration** (vegetated practices with a soil filter media, and the latter with an underdrain)
		Permeable pavement
		Green streets (often an aggregate of bioretention/biofiltration and/or permeable pavement)
		Infiltration BMPs (non-vegetated infiltration trenches, dry wells, rock wells, etc.)
		Bioswales (vegetative filter strips or vegetated swales)
		Rainfall harvest (green roofs, cisterns, rain barrels)
	Flow-Through Treatment BMP	Media/cartridge filters, high-flow biotreatment filters, etc.
	Source Control Treatment BMPs	Catch basin inserts, screens, hydrodynamic separators, trash enclosures, etc.

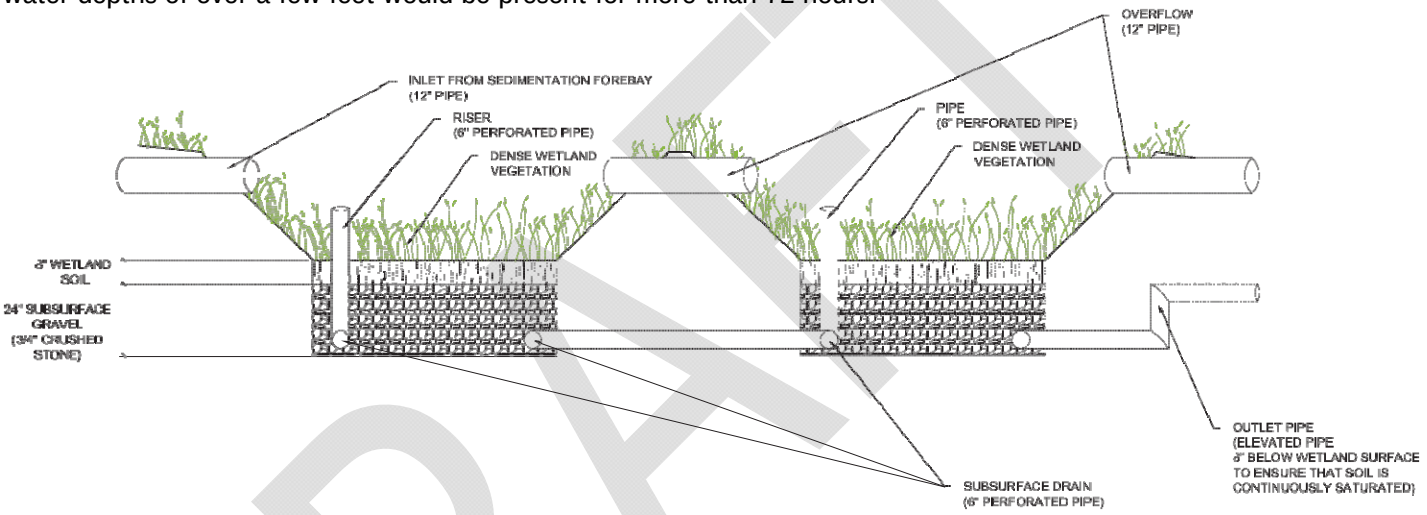
Regional BMPs

Regional BMPs are large scale runoff treatment and retention systems that accept runoff from tens to hundreds of acres of development. They generally support multiple beneficial uses such as groundwater recharge and recreation to achieve Integrated Regional Water Management Program objectives.

Typically the first flush of runoff, which carries the pollutants of concern and debris at high concentrations, receives solids removal pretreatment. In most areas, after the runoff is captured and stored it can be treated and discharged, used for non-potable purposes, infiltrated into the soil, or a combination of the three.

Subsurface Flow (SF) Wetlands

Unless extensive land area and substrate is available, subsurface flow wetlands are generally reserved as a tertiary treatment or polish for the effluent from wastewater treatment facilities, but can be utilized in relatively small catchments where nutrients are a significant issue. The design is generally based on either a relatively dependable and consistent inflow or the ability to primarily function in detention rather than extended retention. They may also be practical for remediation of dry-weather and very low first flush runoff drainage systems, so long as higher flows may be diverted away. They are impractical where water depths of over a few feet would be present for more than 72 hours.



Adapted from:
Subsurface Gravel Wetland
University of New Hampshire Stormwater Center. 2007 Annual Report.

Extended Retention Wetlands

Extended retention wetlands are favored where rainfall or runoff is present year round so that replenishment water is available to maintain the wetland and aquatic life. They must also discharge when large storm events or storm event series are encountered. While water depths are greater for subsurface flow wetland, and therefore the area requirements are lessened, there is a significant risk of the water becoming stagnant and overgrown with algae mats. In this case, where the wetland is expected to function for retention, the seasonal volume of water that must be accommodated, and the wetland, becomes excessively large, since the rainfall depth would grow from 0.75 inch to perhaps 2 feet. This BMP would be modeled as a constructed surface flow wetlands in the RAA.

Seasonal Dry Detention Pond

Seasonal detention ponds are an effective method for detaining runoff so that it can be metered out through a secondary treatment, such as a bioswale, sand filter, or media filter. They are also effective in avoiding damage associated with hydromodification or flooding due to limited downstream conveyance capacity. However, as with the prior wetland examples, they must either drain completely within a few days or be excessively large to accommodate the seasonal runoff from a large catchment.

Surface Infiltration Basins

Surface infiltration basins and spreading grounds can be found locally in the San Fernando Valley, below Whittier Narrows and in the Chino Basin, where they make an important contribution towards regional groundwater management. A key characteristic of these basins is placement over alluvial soils that allow rapid drawdown following the storm event. The area between the lower Rio Hondo and Los Angeles River has limited areas suitable for very rapid infiltration, but there may be opportunities on the east side of the Cities of Bell Gardens and Commerce or there are horizontal basins that parallel the rivers and can allow both settling and infiltration or horizontal wells. Spreading grounds owned by LACFCD may require storage and pre-treatment before being allowed for infiltration through the spreading grounds.

Underground Cisterns

For those WMP areas where infiltration is deemed infeasible, the MS4 Permit directs the implementation of water use projects, which can be supported using underground cisterns that temporarily store the runoff until needed for reuse such as for irrigation. These systems can take many forms such as below grade water tanks, mediums sized modular precast concrete units, or very large precast bridge or arch structures. Modular units are installed over a water proof geotextile to retain the water within the cistern. A recently constructed example of this technology is Garvanza Park in the City of Los Angeles. Here modular units were installed under an existing park to accept storm or urban runoff. Flows beyond the cistern capacity are bypassed down the pre-existing storm drain. The stored water is used for park irrigation, during the early morning hours when the park is closed and there is the least risk of bodily contact.

Subsurface Infiltration Basins

In areas where infiltration is favorable, a similar cistern design can be used, except the geotextile is omitted so that the runoff may infiltrate into the ground below the cistern and be naturally filtered before recharging the regional groundwater table. In the case of the City of Downey Discovery Park, the cistern provides 3.3 acre feet of infiltration storage and an additional 4.8 acre feet of peak flow detention to avoid regional flooding. Systems for this size warrant multiple entry points and a vent system to allow air to escape during periods of peak runoff inflow, which has been estimated at 100 cubic feet per second.

Low Flow Diversion Pump Station

Low flow diversion pump stations are operationally straight forward, but connection to the sanitary sewer system can be problematic due to capacity issues, connection limitations, treatment costs and unexpected prohibitions due to changes in the water quality. The Permittees within the LAR UR2 WMA are situated in an upper watershed that generates little or no summer flows, suggesting that seasonally, the only flows currently present may be urban runoff. This might provide a rationale for allowing a few diversion stations to be constructed to eliminate the flows and any contribution to downstream

impairments. Typically, they are constructed as a manhole adjacent to, and slightly deeper than, adjacent drainage channels so that flows can be easily diverted and then pumped to the sanitary sewer. This BMP would be modeled as a treatment facility in the RAA.

Sand and Media Filter

Surface, or Austin sand filters, are at ground-level and typically earthen. They are usually easier to maintain, but have a large footprint. Perimeter, or Delaware, sand filters consist of two parallel trench chambers located in concrete vaults below an impervious surface, such as a parking lot. Sand filters are estimated to remove 80 percent of total suspended solids, 50 percent of total phosphorus, 25 percent of total nitrogen, 40 percent of fecal coliform, and 50 percent of heavy metals from typical stormwater runoff. Media filters detain and treat stormwater via filtration and adsorption of pollutants to the filter media (San Francisco, 2010). Media filters containing both organic and mineral filtration materials generally have greater ion exchange capacity than sand filters, and therefore can more effectively remove soluble metals and other dissolved pollutants. This renders media filters particularly effective for roadways and highly industrial sites that contribute higher concentrations of metals to stormwater runoff, particularly zinc and copper. These filters have been shown to consistently remove over 85 percent of oil and grease, 82 percent of heavy metals, and around 40 percent of total phosphorus. While media filters are generally better at removing metals and organics, new media types may have the capabilities to reduce nutrients and sulfate in the future (Water Remediation Media, SWS).

Membrane Filtration

Membrane Filtration water treatment systems use semi-permeable membranes under high pressure to exude a clean water product, leaving behind a brine with the pollutants. The higher pressure membrane types such as reverse osmosis or ultra filtration are highly effective at removing dissolved contaminants, while lower pressure systems filter bacteria and viruses. These systems usually require pre-treatment as particulate matter can foul the ion selective membrane and reduce performance.

Ion Exchange

Ion exchange is a polishing step that specifically targets polar dissolved constituents, such as sulfate. Pretreatment is required prior to ion exchange as suspended solids will clog the exchange columns. Ion exchange systems can be used to treat stormwater from pollution generating impervious surfaces at end-of-pipe using a pump system; they are also commonly used to treat contaminated groundwater.

Distributed BMPs

The MS4 Permit encourages the use of LID BMPs, during planning, development and redevelopment, to manage runoff, and the pollutants it contains, at the source by encouraging infiltration. LID employs landscape and structural features to minimize imperviousness and manage stormwater as a resource. Broadly applied, LID can contribute to restoring a watershed's hydrologic functions by promoting infiltration and the natural movement of water (LID, USEPA). Since LID based BMPs encourage infiltration of runoff, and the pollutants it conveys, it has the potential to address most anthropogenic impairments and achieve WQOs for bacteria. The following paragraphs characterize several broad categories of applicable LID BMPs.

Bioretention Planters and Rain Gardens

With bacteria and nutrients being concerns for the LAR UR2 WMA, bioretention is a promising solution that relies on inundation tolerant vegetation and native or engineered soils with high organic content, to capture, infiltrate, and transpire runoff, while retaining pollutants. If designed properly, especially where native soils are sufficiently permeable and without other constraints to infiltration, rain gardens and larger bioretention facilities can be aesthetic amenities in addition to being cost effective and scalable stormwater retention sites that are easily integrated into highly urbanized retrofit projects. The planters should be flat and require maintenance such as weeding, trimming, and the replacement of dead plants (San Francisco, 2010).

Rain Barrels

Rain barrels hold roof runoff, usually delivered by rain gutters and downspouts, and store the water for later use. Screen installations at the downspout inlets prevent sediment, leaves, debris and mosquitoes from entering the rain barrel. Rain barrels are easily constructed for aesthetic purposes to compliment adjacent structures. Overall, maintenance requirements are minimal and include frequent visual inspections during the storm season and removal of accumulated sediment or debris. When effectively designed to capture and contain the runoff from a rooftop structure, a rain barrel can prevent runoff from small frequency storm events from ever leaving the property. This will reduce onsite water usage and the amount of pollutants that may potentially be carried offsite. This LID BMP can be implemented throughout residential areas.

Cisterns

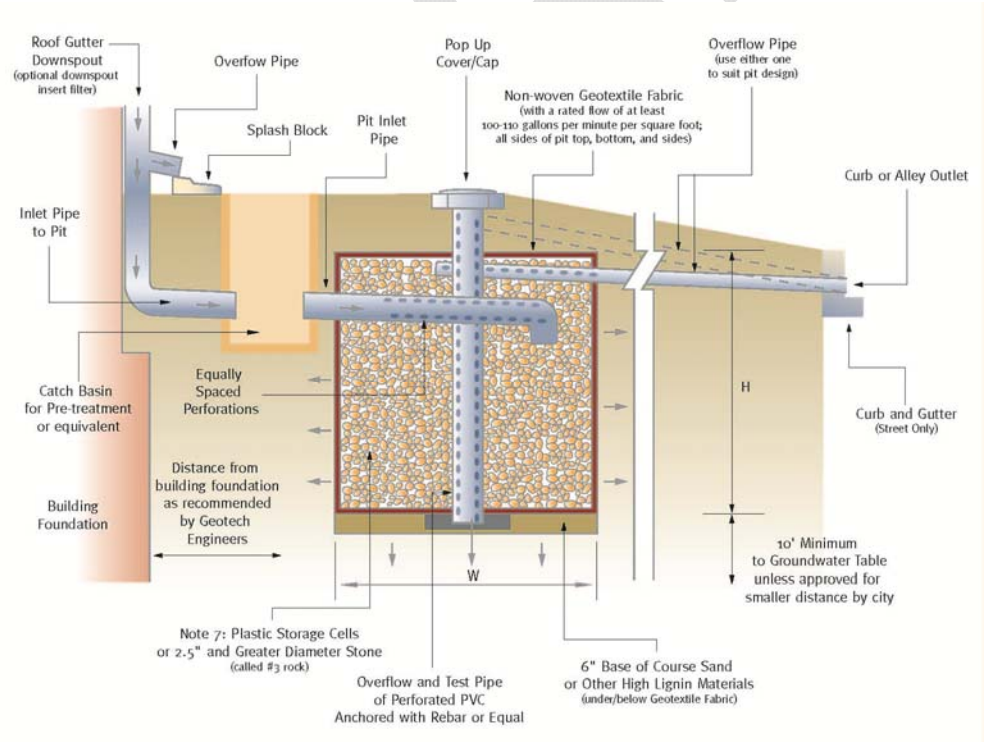
Cisterns provide retention storage in above or below ground storage tanks that accept divert roof runoff and distribute it for later use, usually by pump to adjacent landscaped areas. Runoff collected in the cistern tank is often used for onsite landscape irrigation since outdoor irrigation can account for 40 percent of water consumption during spring and summer. Cisterns can be constructed of nearly any impervious, water retaining material and are distinguishable from rain barrels only by their larger sizes and different shapes. Cisterns are an effective onsite retrofit option for treating rooftop runoff from selected residential, commercial, industrial, institutional, and municipal sites. By using cisterns, a quantifiable amount of stormwater runoff from impervious surfaces such as rooftops, parking structures, and elevated walkways can be captured and stored onsite to reduce the runoff volume and peak runoff flow rates. For smaller storm events, this captured runoff will reduce pollutant loads to the MS4 by preventing the first flush of contaminants from leaving the source site. Stored rainwater may also be used to conserve potable water supplies and reduce water utility bills.

Infiltration Pits and Drywells

Infiltration pits are among the first BMPs used in the Los Angeles region and are typically constructed by digging pits sized to accommodate the runoff source and design storm, lined with geotextile filter fabric, and filled with gravel or aggregate. The retention volume can be increased using various open retention systems or large diameter plastic half pipes in addition to the aggregate. The surface can be either open to accept incoming runoff or receive the downspout from a rain gutter and then covered with vegetation.

A dry well is operationally similar to an infiltration pit, but larger and more formally constructed. Pretreatment techniques, such as grass filter strips, a sand layer, clean aggregates, or a small settling chamber, are recommended to prevent clogging and maintain infiltration. It is recommended that dry wells maintain a minimum clearance of 10 feet from the surface of the seasonal high water table and any foundations. Dry wells are lined with geotextile filter fabric to prevent soil intrusion and filled with clean graded aggregate or volume enhancing structures, such as open plastic half pipes (San Francisco, 2010).

When designed properly, a dry well can serve small impervious areas such as residential rooftops, however if they are bored, drilled, or driven shaft, or a dug hole that is deeper than its widest surface dimension, it may be classified as a Class V injection well and requires permitting through the USEPA. This LID BMP has high pollutant removal efficiencies for sediments, nutrients, trash, metals, bacteria, oil, grease, and organics.

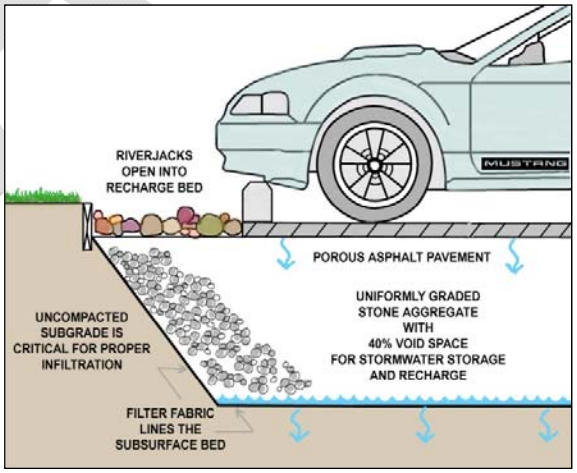


Infiltration Basins, Swales, and Trenches

An infiltration basin or trench is a shallow impoundment over permeable soil that holds and stores runoff until infiltration can occur, using the natural filtering ability of the soil to filter out pollutants. This LID BMP is effective at retaining sediments associated with pollutants, but can become clogged requiring removal of the upper soil. Use of a vegetated swale, or settling forebay, will extend the basin's longevity and reduce maintenance costs. Infiltration basins are best constructed over soils with infiltration rates of 0.5 inches/hour or greater and they should have at least a four foot separation from basin bottom to groundwater (San Francisco, 2010).

If adequate space is available, infiltration basins are cost-effective measures even for regional scale projects, because little infrastructure is needed for their construction. However, site-specific conditions can cause significant variations in cost. CASQA (2003) cites costs ranging from approximately $3 to $18 per cubic foot of storage. Annual maintenance costs are estimated to be approximately five to ten percent of the construction costs (Class V Wells, USEPA).

Porous/Pervious Pavements



Pervious pavement allows rainfall to drain into an aggregate bed or structural retention unit where it is stored until infiltration can occur. There are many pervious pavements including porous concrete, plastic grid system, interlocking paving stones, brick, grass pavers, gravel pavers, and crushed stones. These materials allow for onsite infiltration that efficiently filters out pollutants such as bacteria, nutrients, and metals. Infiltration rates of the native soil are a key element to the overall design. Pervious pavements can be designed with a perforated underdrain system to redirect stormwater to a storm drain in areas where infiltration is infeasible. Using an underdrain system still results in improved water quality since stormwater will have passed through the BMP and undergone natural filtration and treatment processes. This type of BMP can also be used to disconnect directly connected impervious areas such as rooftops and parking lots. Vegetated runoff should not drain onto the pervious pavement as it may clog the system and require more frequent maintenance. Permeable pavements may be used in many locations where conventional pavements are used, such as parking lots, driveways, and walkways. Areas with the potential for spills, such as gas stations, should be avoided. Using proper maintenance techniques, pervious pavement can remove a significant portion of pollutants in stormwater runoff and reduce pavement ponding.

Green Roofs

Green Roofs are commonly recommended LIDs that are appropriate in some climates, but may be challenging to maintain or support in areas with a risk of brush fires and little annual rainfall. Intensive systems have large depths and cover much of the roof while extensive systems features minimal plantings that require little maintenance. Green roofs enhance water quality, reduce runoff and are visually appealing as a rest area above office buildings. The amount of stormwater that a green roof can contain is proportional to the area of coverage, types of plants, slope, and many other factors. Green roofs can be constructed during the building's construction phase or included as a retrofit. When retrofitting, it must be noted that the building needs to support the weight of the green roof under fully saturated conditions. A waterproof membrane should be laid over the building to protect it from structural damage and overflow should be addressed through a drainage layer. Green roofs also provide insulation, help reduce building temperatures during summer months, and counter the heat island effect.

Green Streets

Like LID, Green Street design is strongly encouraged by the MS4 Permit and all of the Permittees within the LAR UR2 WMA have developed or adopted green streets policies. They can take many forms such as an inverted street cross section with a vegetated low center median, vegetated curb extensions, parkways that trap and hold gutter flows, planter boxes connected to the gutter and filled with highly porous soil and appropriate vegetation. In areas where sediment generation is limited or can be accommodated by pretreatment through a bioswale, porous concrete may be used to construct gutters so that flows may infiltrate. The City of Santa Monica is currently investigating the construction of large infiltration systems within the parkway that may be designed to accept dry weather or design storm flows for small residential catchments. When properly designed, these structural BMPs can alleviate many of the types of pollutant that are of particular concern to the City.

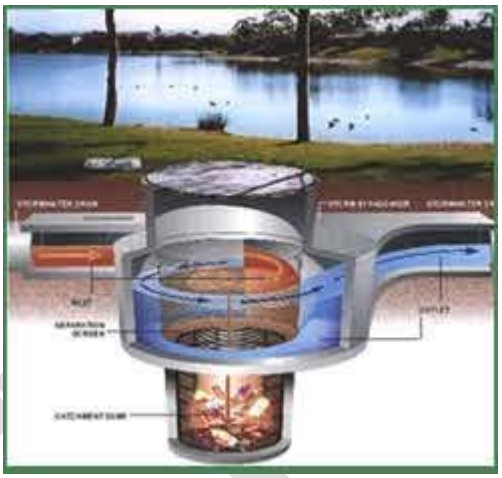
Connector Pipe Screens

While several devices have been certified as meeting the LARWQCB definition of full capture (Full Capture, LARWQCB) the most commonly installed device in Los Angeles County is a Connector Pipe Screen (CPS). Generically, CPS are made from stainless steel mesh, with 5 mm openings, that stretch in front of the lateral or outlet from a catch basin and are secured to the walls and floor of the catch basin, with an opening above the screen that is greater in area than the outlet. During most events runoff will flow through the screen leaving the trash upstream of, or on, the screen. However, during high intensity storms or if the mesh becomes occluded, runoff can still flow over the screen and out of the catch basin to prevent flooding. Based on experience in other jurisdictions, 75-90 percent or more of the catch basins can be retrofitted with this device. While regular maintenance, to remove debris trapped on and on the upstream side of the screen, is required, the intensity of maintenance is correlated with the amount of trash and debris collected. The Regional Board is familiar with the device and assessing compliance through their use, so it is expected that implementation should be relatively straight forward. In locations were the trash load results in excessive maintenance costs, many communities also install Automatic Retracting Screens (ARSs).

Automatic Retracting Screens

An ARS extends across the opening or "mouth" of the catch basin and traps trash and debris at street level where street sweepers or hand crews may remove the trash before it can enter into the catch basin or drain. However, in order to avoid flooding, they will open or retract and allow the trash to enter the catch basin and be trapped on the CPS, where maintenance costs are higher. Areas that generate sufficient trash and debris to warrant the use of ARS in combination with a CPS are usually also subject to enhanced street sweeping, on a weekly or even more frequently, basis.

Hydrodynamic Separation Devices (CDS systems)



Hydrodynamic Separation Devices such as continuous deflective separation (CDS) systems are often used to ensure compliance with trash TMDLs. A CDS system effectively screens, separates and traps debris, sediment, and oil and grease from stormwater and urban runoff. The indirect screening capability of the system allows for 100 percent removal of floatables and neutrally buoyant materials, without binding. The system utilizes the natural motion of water to separate and trap sediments by indirect filtration. As the storm water flows through the system, a very fine screen deflects the pollutants, which are captured in a litter sump in the center of the system. CDS system screens are self-cleaning. The water velocities within the swirl chamber continually shear debris off the screen to keep it clean. CDS systems are ineffective in removing soluble pollutants and smaller, less-settleable solids. They can provide effective pretreatment when paired with filtration devices, such as media filters or bioretention area, covered in sections below, to achieve higher removals of nutrient, metals, and organics. Between storms, the CDS system can have standing water that could raise mosquito breeding concerns, which increase the concerns of vector control (San Francisco, 2010).

The processing capacities of a CDS unit vary from 3 to 300 cubic feet per second, depending on the application. Precast modules are available for flows up to 62 cubic feet per second, while higher flow processing requires cast-in-place construction. Every unit requires a detailed hydraulic analysis before it is installed to ensure that it achieves optimum solids separation. The cost per unit (including installation) ranges from $2,300 to $7,200 per cubic feet per second capacity, depending on site specific conditions and does not include any required maintenance (Hydrodynamic Separators, USEPA).

Maintenance of the CDS system is site-specific but manufacturer recommends that the unit be checked after every runoff event for the first 30 days after installation. During this initial installation period the unit should be visually inspected and the amount of deposition should be measured, to give the operator an idea of the expected rate of sediment deposition. After initial operational period, it is recommended that the CDS system be inspected at least once every thirty days after the wet season. During these inspections, the floatables should be removed and the sump cleaned out. It is also recommended that the CDS systems be pumped out and the screen inspected for damage at least once per year.

3.2.2 Summary of Existing Structural BMPs

The Los Angeles County Unified Annual Stormwater Reports identify the numbers and types of BMPs installed and maintained by jurisdiction. LAR UR2 WMA members identified the following stormwater pollutant watershed control measures as particularly effective:

- Street Sweeping
- Catch Basin Cleaning
- Catch Basin Inserts
- Trash Bins
- End-of-Pipe Controls such as Low-flow Sanitary Sewer Diversions
- Infiltration Controls
- Erosion Controls
- Public Education and Outreach

Based on Appendices B and C of the Los Angeles County MS4 Permittees 2010-2011 annual reports, the most frequently cumulatively installed and prevalent BMPs are summarized within **Table 3-3** and **Table 3-4**, respectively. Three of the four most frequently installed BMPs, were primarily implemented through a grant received by the Gateway Council of Governments (COG), suggesting that the most efficient means of achieving water quality objectives and implementing the BMPs desired by the Regional Board, would be by providing grants for them to be installed, so that local design engineers, developers, government, and contractors could become familiar with use of the devices.

Table 3-3 Cumulatively Most Frequently Installed BMPs Countywide

BMP Type	Total Number Installed
Catch Basin CPS	6,377
Fossil Filter Catch Basin Insert	5,968
ARS	3,870
Clean Screen Catch Basin Insert	3,767
Extra Trash Can	3,681
Covered Trash Bin	3,119
Signage and Stenciling	1,884
Drain Pac Catch Basin Insert	1,625
Cultec Infiltration Systems	1,296
Infiltration Trenches	963
Infiltration Pit	958
Abtech Ultra Urban Catch Basin Insert	748
CDS Gross Pollutant Separator	438
United Stormwater Catch Basin Screen Inserts	403
Restaurants Vent Traps	258
Stormceptor Gross Pollutant Separators	211

Table 3-4 Most Prevalent BMPs Installed During 2010-11

Types of Non-Proprietary BMPs Used By Most Permittees		Types of Proprietary BMPs Used By Most Permittees	
BMP Type	**Number of Cities**	**BMP Type**	**Number of Cities**
Infiltration Trenches	40	Fossil Filter Catch Basin Insert	46
Covered Trash Bins	32	CDS Gross Pollutant Separator	36
Extra Trash Bins	31	Drain Pac Catch Basin Insert	21
Enhanced Street Sweeping	26	Clean Screen Catch Basin Insert	21
Dog Parks	23	Stormceptor Gross Pollutant Separator	19

Los Angeles County Unified Annual Stormwater Reports, Appendices B and C submitted from 2004 through 2012, were used to develop a BMP installation summary table, provided in **Appendix G**.

3.2.3 Approach to Screening for Potential Regional BMP Sites

In order to ensure compliance with the MS4 Permit specified numeric limits, regional projects can be used to enhance water quality. This approach was developed and used to identify a broader list of regional

projects to include in this WMP, which could be initially short-listed through the RAA, but remain potentially viable if RAA projects became untenable. The approach may also be used in the future during the adaptive management process, therefore potential projects identified and not incorporated into the WMP are still identified. In order to identify and prioritize potential regional project sites, Structural BMP Prioritization and Analysis Tool (SBPAT) was used. SBPAT was also used to conduct the LAR UR2 WMA RAA, therefore additional details regarding this program can be found in **Section** 4. In addition to this approach, existing planning documents were referenced in order to determine if any regional BMPs are planned. Accessible planning documents show no indications that regional BMPs have already been planned in this area.

3.2.3.1 SBPAT Process for Identifying Potential Regional BMP Sites

SBPAT is able to prioritize among catchments and subcatchments based on water quality needs (i.e., pollutant load) and identify parcels that provide opportunities for implementation of structural BMPs. In order to reflect the anticipated relative challenge of achieving compliance with TMDL-based effluent limits, bacteria were assigned a relative weight of 20, while metals (copper, lead, and zinc) were collectively assigned a weight of 15 and all other pollutants set to zero.

After first evaluating and prioritizing watershed subcatchments, based on water quality needs, SBPAT identifies potential BMP opportunities by calculating regional BMP scores for each subcatchment within a watershed. Parcel scores are determined for each subcatchment based on parcel size, ownership, land use, and distance from major storm drains, then the parcel scores are integrated to determine a BMP score. BMP scores are compared with regional BMP scoring, resulting in a list of potential structural BMP opportunities based on parcel characteristics and water quality considerations. A comprehensive overview of the modeling framework can be found in the SBPAT User's Guide (Geosyntec, 2008). This SBPAT process will generally follow the steps established in the Los Angeles County-wide Structural BMP Prioritization Methodology (Geosyntec, 2006), as implemented within SBPAT.

Figure 3-1 ranks Catchment Prioritization Index (CPI) scores from 2 to 5, with the highest rankings (4 or 5) attributable to large subcatchments with primarily industrial, manufacturing, and commercial land use parcels, whose model attributes would be generally expected to generate data with high runoff rates and pollutant loads. The only low (2) priority subcatchments were in southeastern portion of Bell Gardens and are dominated by land use features that include a large park, electric transmission lines, and single family residential homes, which together would be expected to model as having low pollution loading and runoff volume potentials.

Figure 3-2 ranks Nodal Catchment Prioritization Index (NCPI) scores, from 2 to 4. This analysis cumulatively considers the discharge from tributary catchment so that one of the previously low ranking catchments in southeastern Bell Gardens, which receives flows from a more typical and large catchment to the north, no longer has a low ranking. Likewise, several previously high ranking headwater catchments now have reduced scores and rankings in comparison to catchments that received cumulative discharges from other tributary catchments, located outside of the LAR UR2 WMA, elsewhere in the Los Angeles River watershed. For the immediate purpose of locating potential regional BMP facilities for consideration during the RAA effort, NCPI scores, rather CPI scores were used in subsequent analyses; however there is potential for distant tributary areas with high CPI scores to the primary source of runoff and contaminants, rather than downstream areas that receive the discharge and may have attributes that meet the preferred regional BMP location selection criteria. Subwatersheds with high CPI scores may represent good sites, as they would capture the primary source of contaminants, but were not the focus of this analysis.

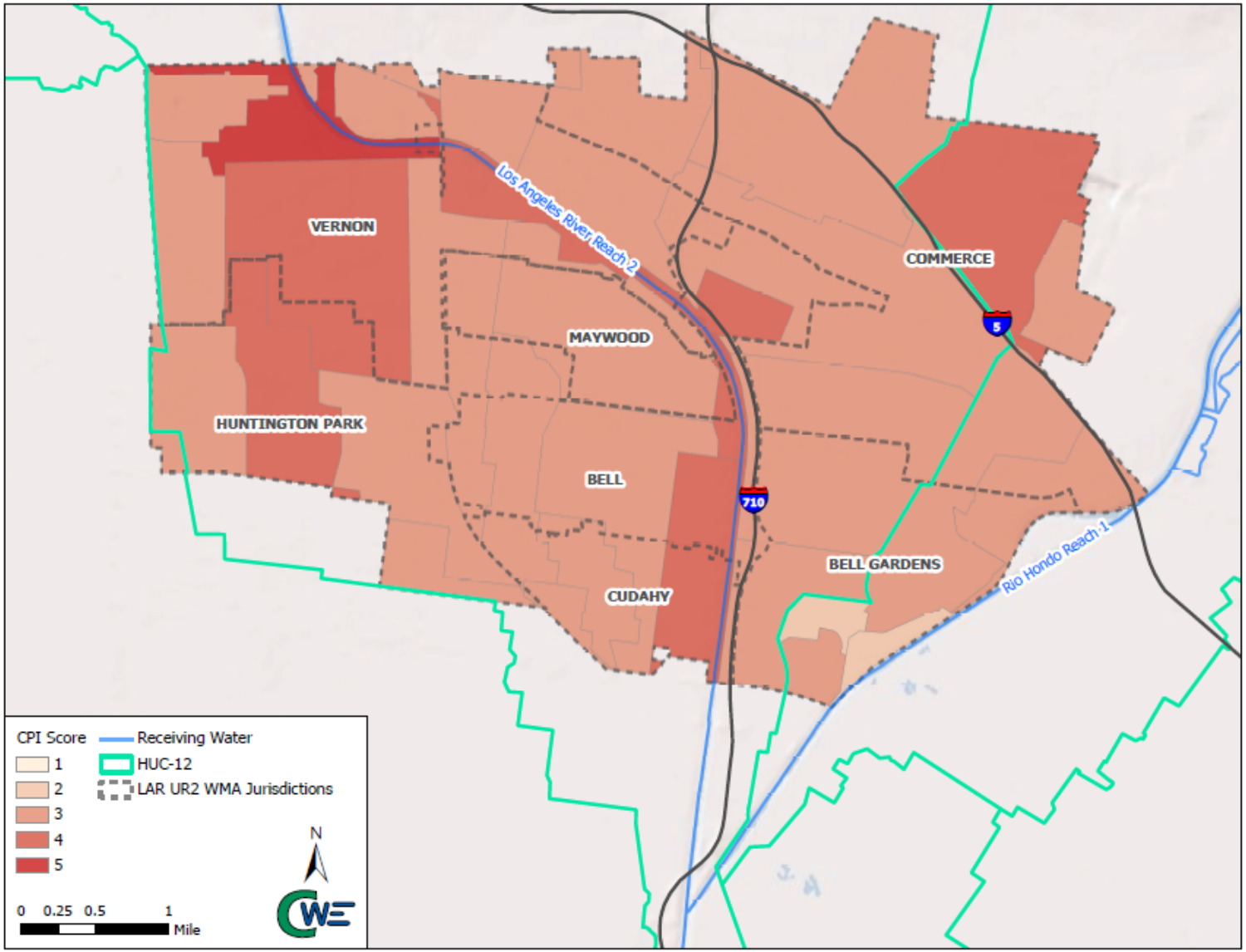


Figure 3-1 SBPAT CPI Scores

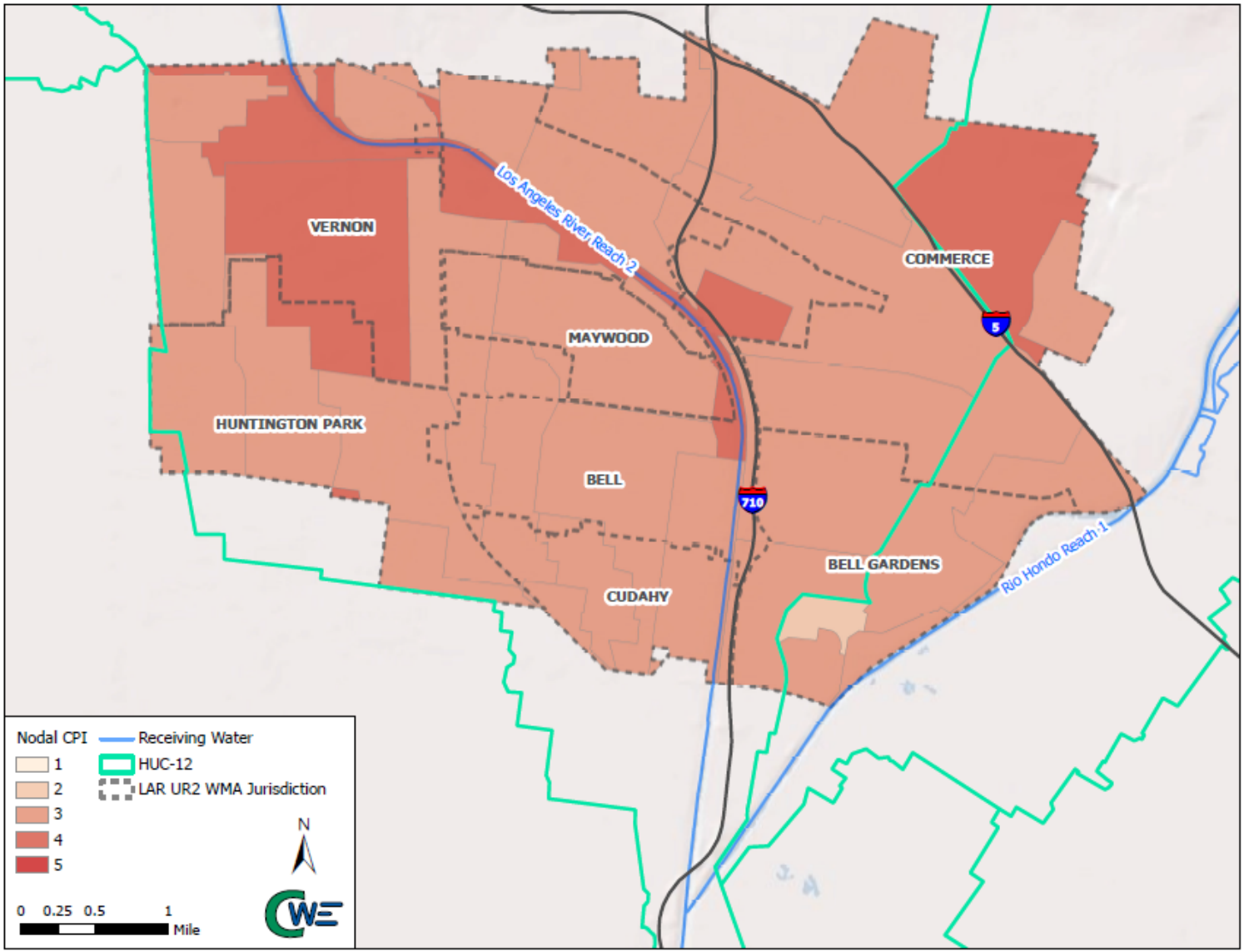


Figure 3-2 SBPAT NCPI Scores

Figure 3-3 illustrates the results of the GIS based SBPAT automated Potential Regional BMP Opportunity screening analysis. Although the selection criteria are flexible and subject to modification, for this analysis the criteria included a minimum acceptable parcel size of 0.5 acres and maximum parcel to storm drain distance of 100 feet. City or County-owned undeveloped parcels were assigned a score of five while other publicly-owned parcels were assigned a score of four, which drives the resultant analysis scoring. Parcels not meeting these criteria were not considered viable regional BMP locations and assigned a zero score. Fourteen subcatchments, or less than half of the LAR UR2 WMA subcatchments, were found to have one or more potential regional BMP opportunity sites that were identified as tributary to areas of high water quality improvement need.

Normally, after potential regional BMP sites are identified, recommended BMP types are matched based on the water quality targets, runoff volumes, and site attributes. The pairing of a BMP type with a BMP site represents a potential regional BMP project. With bacteria being a main driver for the LAR UR2 WMP RAA, the initial selection of suitable regional BMP types was constrained to those capable of achieving recreational beneficial use objectives, which include infiltration basins and subsurface flow wetlands.

Figure 3-4 identifies the surficial soil types, which are primarily slowly infiltrating loams, the important regional groundwater basin, and SBPAT analysis identified potential regional BMP opportunities, illustrated in red as Potential Regional BMP Sites. The areas of Tujunga Fine Sandy Loam, located immediately adjacent to the lower Rio Hondo, Los Angeles River, and further west as a strip leading south through the middle of the Cities of Vernon and Huntington Park, may signify the presence of old deep river channels with relatively sandy soils that could potentially accommodate high infiltration rates. If present and protected from sediment induced blockage, these could horizontally distribute infiltrated runoff to other intermingled sandy layers that might otherwise seem inaccessible due to scattered clay lens of low permeability soils.

Figure 3-5 illustrates the RAA Guideline standard model land use classifications within the LAR UR2 WMA, particularly around the SBPAT identified potential regional BMP sites. As might be expected the Cities of Vernon, Commerce and northeastern Bell contain a relatively high proportion of industrial or manufacturing and commercial land use areas and few vacant or agricultural areas. Most of the parcels in these categories, which might be more potentially accessible for the construction of infiltration basins are actually electrical transmission line easements or associated with the Long Beach (I-710) freeway.

Since the number of subcatchments with potential regional BMP opportunities was limited, and the identified parcels relatively small for these facilities, a coarse assessment of total catchment BMP sizing needs, regardless of site constraints, was prepared for comparison with future unanticipated private parcel acquisition opportunities. The major catchments in LAR UR2 WMA used for this analysis are consistent with monitoring sites in the CIMP and are illustrated in **Figure 3-6**. This analysis was prepared as the product of the sum of areas, for each of the major LAR UR2 WMA Cities, area weighted land use based imperviousness, and the weighted 85th percentile 24-hour rainfall depth. The results expressed as runoff volume in acre-feet are in the second column from the right in **Table 3-5**. The area needed for a regional BMP holding an average water depth of 1 foot, would be approximately the same as this volume, while the area of a basin, or cistern, holding a depth of 10 feet of water would be approximately an order of magnitude less (i.e. one tenth the surface area size). Assuming an infiltration rate of 0.3 inches per hour (very low type B soil) and desired draw down time of 72 hours, results in a water depth of 1.8 feet and basin area as summarized in the rightmost columns of the two tables.

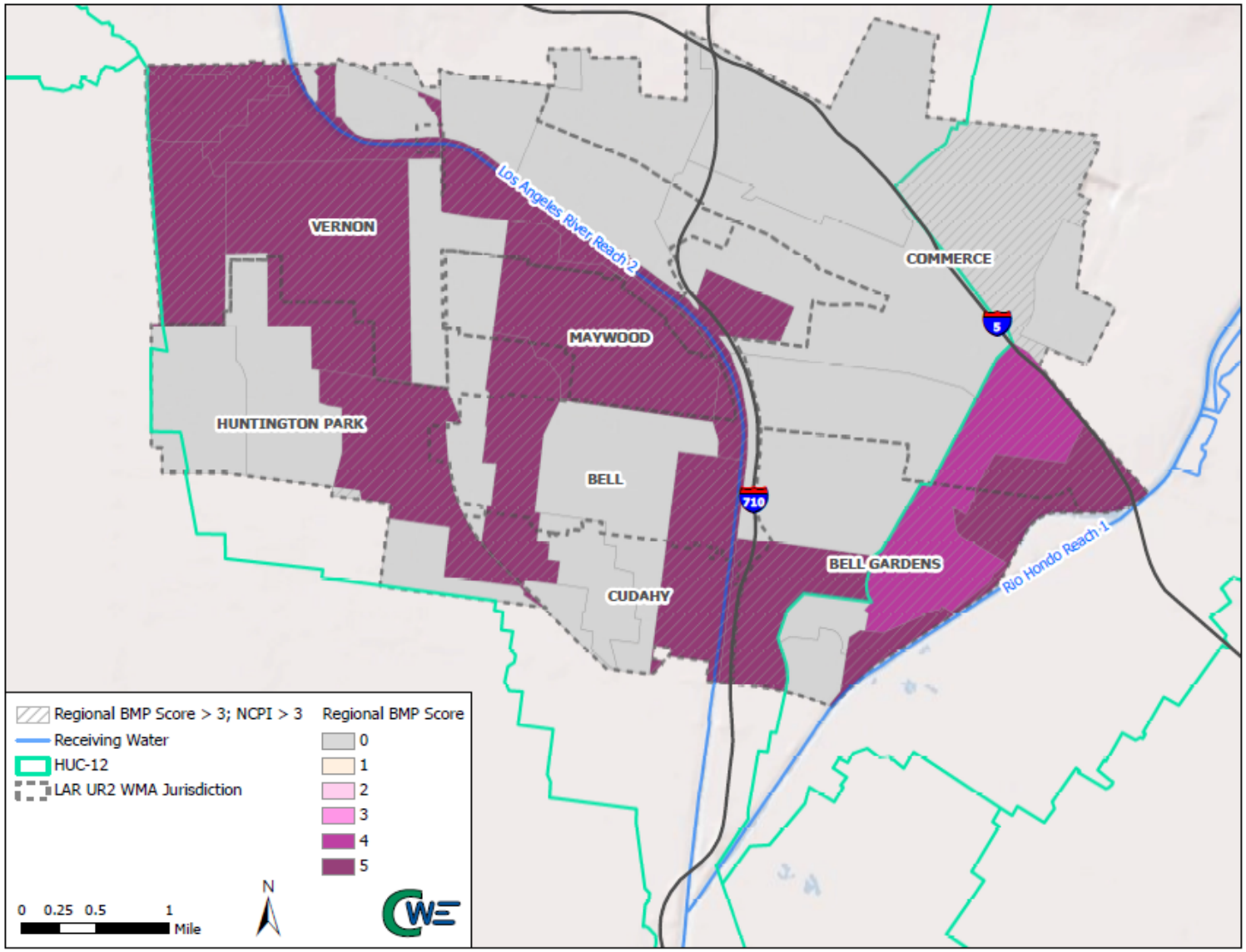


Figure 3-3 SBPAT Regional BMP Opportunity Scores (normalized to values of 0 to 5)

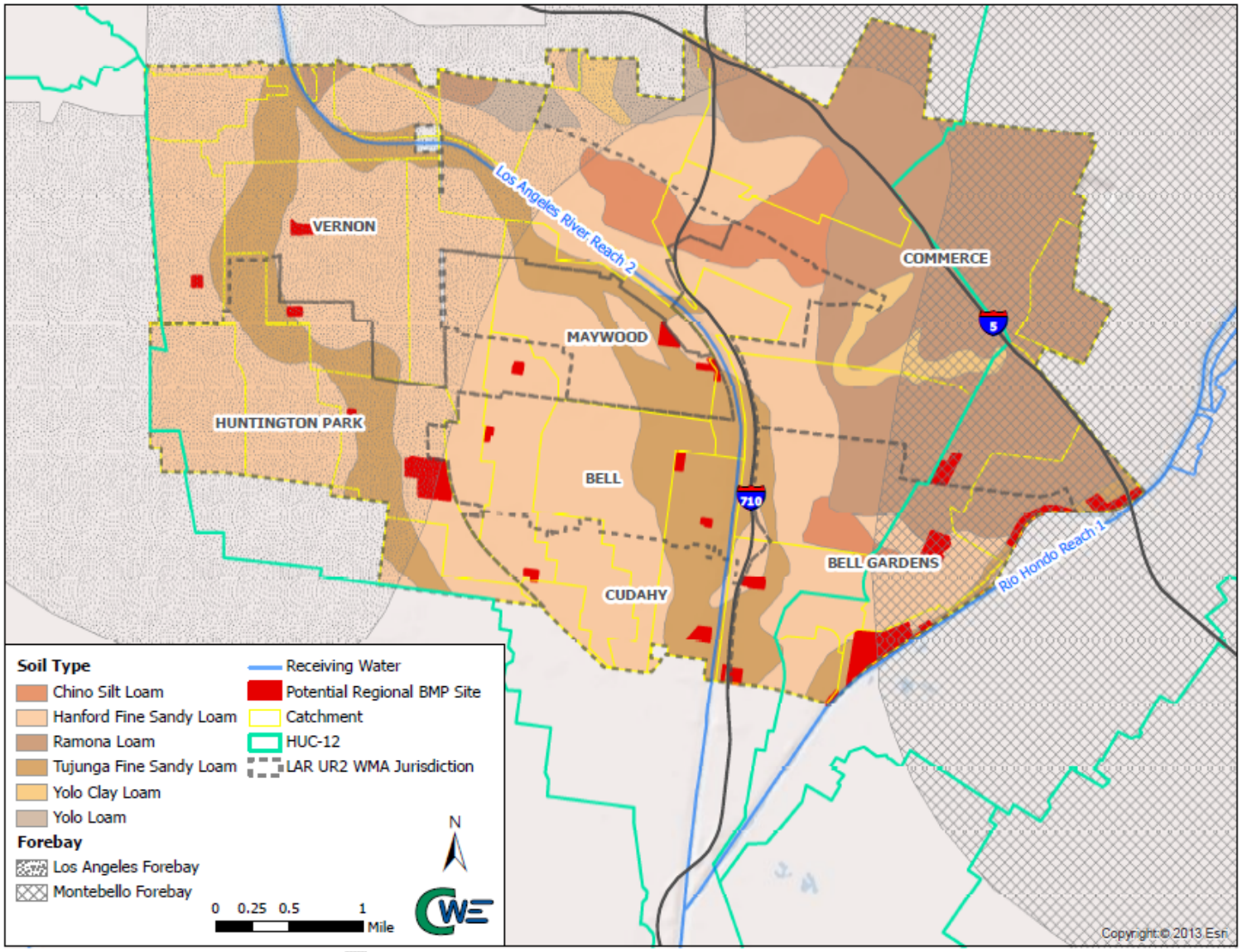


Figure 3-4 Surficial Soil Types, Groundwater Basins, and Potential Regional BMP Sites

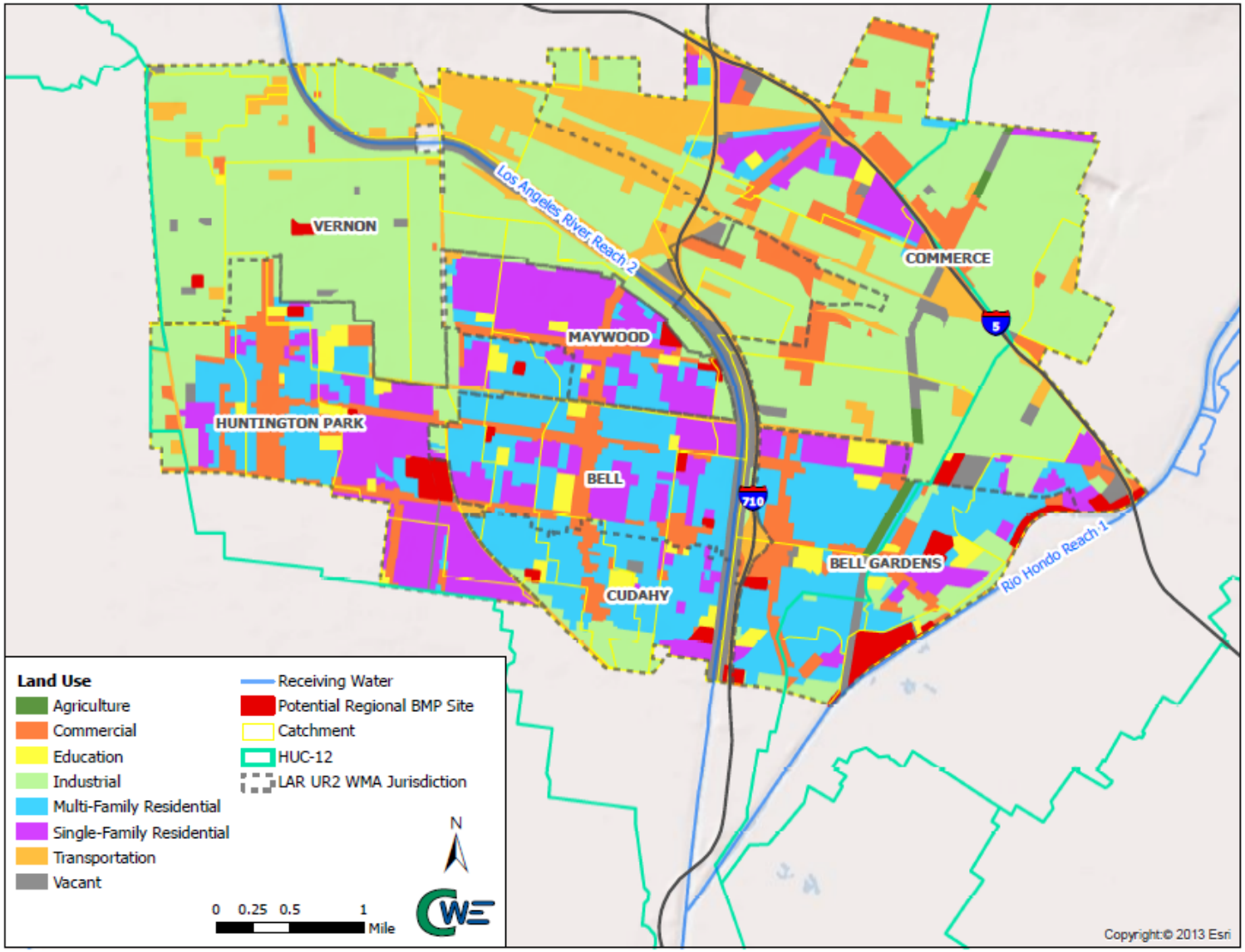


Figure 3-5 Land Use Classes Near Potential Regional BMP Locations

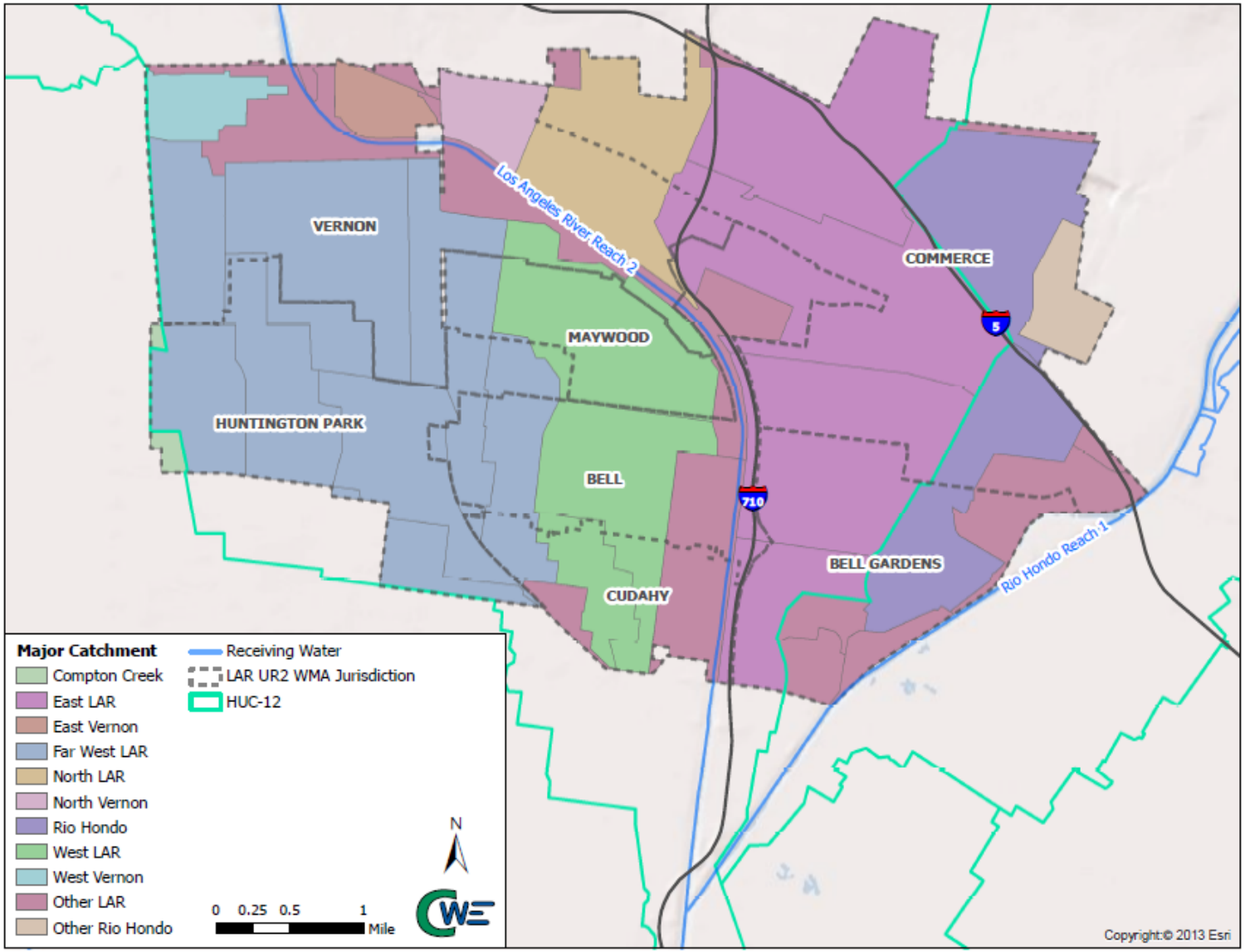


Figure 3-6 LAR UR2 WMA Major Catchments

Table 3-5 Estimate Runoff Volume and Regional BMP Area by City and Catchment

City	Major Catchment	Area (Acres)	Weighted		Runoff Volume (Acre Feet)	Basin Area 1.8' Deep
			Imperviousness	Rain (inch)		
Bell	East LAR	388	0.832	0.91	24	14
	Far West LAR	329	0.609	0.92	15	9
	North LAR	10	0.741	0.91	1	0
	West LAR	539	0.666	0.92	28	15
	Other LAR	410	0.787	0.92	25	14
	Total	**1676**	**0.723**	**0.918**	**93**	**51**
Bell Gardens	East LAR	780	0.637	0.93	39	21
	Rio Hondo	354	0.677	0.94	19	10
	Other LAR	443	0.600	0.94	21	12
	Total	**1578**	**0.636**	**0.935**	**78**	**43**
Commerce	East LAR	2279	0.791	0.91	137	76
	North LAR	377	0.886	0.9	25	14
	North Vernon	1	0.910	0.91	0	0
	Rio Hondo	1025	0.857	0.9	66	37
	Other LAR	310	0.679	0.92	16	9
	Other Rio Hondo	203	0.899	0.91	14	8
	Total	**4194**	**0.813**	**0.907**	**258**	**143**
Cudahy	East LAR	38	0.639	0.94	2	1
	Far West LAR	113	0.621	0.93	5	3
	West LAR	339	0.792	0.93	21	12
	Other LAR	297	0.716	0.94	17	9
	Total	**786**	**0.731**	**0.934**	**45**	**25**
Huntington Park	Compton Creek	42	0.864	0.95	3	2
	Far West LAR	1853	0.667	0.93	96	53
	West LAR	31	0.565	0.93	1	1
	Other LAR	4	0.239	0.93	0	0
	Total	**1930**	**0.670**	**0.930**	**100**	**56**
Maywood	Far West LAR	131	0.620	0.92	6	3
	West LAR	601	0.551	0.92	25	14
	Other LAR	22	0.792	0.92	1	1
	Total	**754**	**0.570**	**0.920**	**33**	**18**

Table 3-5 Estimate Runoff Volume and Regional BMP Area by City and Catchment

City	Major Catchment	Area (Acres)	Weighted		Runoff Volume (Acre Feet)	Basin Area 1.8' Deep
			Imperviousness	Rain (inch)		
Vernon	East LAR	85	0.758	0.91	5	3
	East Vernon	157	0.911	0.92	11	6
	Far West LAR	1448	0.885	0.96	103	57
	North LAR	367	0.840	0.93	24	13
	North Vernon	211	0.880	0.93	14	8
	West LAR	130	0.908	0.94	9	5
	West Vernon	202	0.903	0.95	14	8
	Other	697	0.889	0.93	47	26
	Total	**3298**	**0.880**	**0.944**	**228**	**126**
LAR UR2 WMA	**Total**	**14215**	**0.761**	**0.925**	**834**	**463**

3.2.3.2 Other Potential Regional BMP Project Sites

Based on the results of monitoring, water quality, technical studies, and source control studies it is questionable as to whether bacteria can be consistently controlled to meet the dry- and wet-weather numeric limits identified in Attachment O of the MS4 Permit, which are based on recreational beneficial use objectives within the Basin Plan, unless MS4 discharges can be eliminated.

Therefore LAR UR2 WMA identified a variety of exemplar projects which were further investigated during the initial phase of the WMP development process to identity new inter-agency opportunities for LID that reduces runoff and controls the discharge from within the LAR UR2 WMA. The potential projects are summarized in **Table 3-6.**

Table 3-6 Preliminary Assessment of Potential Regional BMP Sites

Potential Project Name	Catchment	Cross Streets	Area (ac)	Green Area (ac)	Attributes	Challenges
Bell						
Bell High School	WLAR	Pine Avenue and Florence Avenue	18.1	4.9		Small Trib
Park Avenue School	WLAR	Florence Avenue and Wilcox Avenue	5.7	1.7	Large Trib	
Veterans Memorial Park	WLAR	Gage Avenue and Wilcox Avenue	3.3	2.4	Med Trib	
United States Army Reserve	Other LAR		UNK	N/A	Current Const	Federal Govt
I-710/Transmission Line	Other LAR	West of I-710	UNK	N/A	LFDs?	Small Trib
Abandoned RR Spurs	Other LAR	Various Locations	UNK	N/A		Pvt Property
Bell Gardens						
Bell Gardens Elementary School	ELAR	Quinn Street and Jaboneria Road	10.4	2.2	Large Trib	
Bell Gardens Intermediate School	ELAR	Florence Avenue and Jaboneria Road	14.6	4.5	Large Trib	
Bell Gardens Park	RH	Florence Avenue and Loveland Street	13.7	10.3		No Drain
Ford Park Golf Course	RH	Garfield Avenue and Park Lane	25.3	18.9	Large Trib	Golf Course
John Anson Ford Park	RH	Garfield Avenue and Park Lane	9.6	7.2	Large Trib	
I-710/Transmission Line	Various	West of I-710/Garfield Avenue	45.8	34.3	LFDs?	Small Trib
Commerce						
Bandini Park	NLAR	Astor Avenue and Hepworth Avenue	2.4	1.8		MS4 Unclear
Bristow Park	NLAR	Triggs Street and McDonnell Avenue	7.0	5.3		No MS4
Park Lawn Memorial Park	RH	Gage Avenue and Garfield Avenue	18.3	13.7		No MS4
Power Facilities Total	ELAR	West of Garfield Avenue	21.6	16.2	Nr Telegraph	
Rosewood Park	ELAR	Commerce Way and Harbor Street	11.3	8.5	Med Trib	
Veterans Park Total	Other RH	Gage Avenue and Zindell Avenue	9.7	7.3	Small Trib	
Abandoned RR Spurs	Various	Various Locations	UNK	N/A		Pvt Property

Table 3-6 Preliminary Assessment of Potential Regional BMP Sites

Potential Project Name	Catchment	Cross Streets	Area (ac)	Green Area (ac)	Attributes	Challenges
Cudahy						
Clara Street Park	ELAR	Clara Street b/w Wilcox and Atlantic Ave	4.1	3.1		No MS4
Cudahy Park	Other LAR	River Drive and Santa Ana Street	7.0	5.2		Unk MS4
Lugo Park	FWLAR	Elizabeth Street and Otis Avenue	1.5	1.1	Med Trib	
Park Avenue Elementary School	Other LAR	River Drive and Elizabeth Street	1.5	1.1		Unk MS4
I-710/Transmission Line	Other LAR	West of I-710/Garfield Avenue	UNK	N/A	LFDs	Small Trib
Huntington Park						
Freedom Park Total	FWLAR	E. 61st Street and Carmelita Avenue	0.8	0.6		No MS4
Nimitz Middle School	FWLAR	E. 60th Street and Carmelita Avenue	8.5	2.3	Small Trib	
Salt Lake Park Total	FWLAR	E. Florence Avenue and Salt Lake Ave	33.4	25.1	Lrg Trib/Prcl	
Maywood						
Maywood Academy High School	WLAR	E. 61st Street and Pine Avenue	1.8	1.4		No MS4
Maywood Elementary School	WLAR	E. 52nd Place and Cudahy Avenue	0.5	0.4		Small Trib
Maywood Park	WLAR	E. 52nd Place and E. 58th Street	6.0	2.6		No MS4
Maywood Riverfront Park Total	Other LAR	E. 59th Place and Alamo Avenue	4.6	3.5		Unk MS4
Vernon						
Abandoned RR Spurs	Various	Various Locations	UNK	N/A		Pvt Property
Vacant Parcel	FWLAR	2221 E 55th Street	7.6	0.0		No Drains
Vernon Power Plant	FWLAR	2701 50th Street	5.510	0.00	South Parcel	Power Plant

3.2.3.3 Evaluating and Prioritizing Potential Regional BMP Project Sites

A planning-level, desktop based feasibility screening assessment was performed to identify potential regional BMP projects for inclusion in the WMP Plan. The County Assessors website was queried for current parcel ownership information and the County Department of Public Works searched for information pertinent to drainage conveyance characteristics for existing facilities. Aerial imagery were reviewed to verify actual and adjacent land use characteristics, assess potential engineering design alternatives, facility footprint, possible sizing and other criteria generally pertinent to an initial assessment of feasibility. Based on this information the subsequent RAA model evaluation step was undertaken to assess the potential beneficial impact of these parcels on LAR UR2 WMA MS4 discharges. The potential regional BMP projects were also evaluated using the cost and water quality analysis module in SBPAT.

The potential regional BMP project configurations and planning-level capital and operation and maintenance costs were evaluated (i.e., quantification of costs and water quality benefits) using SBPAT. SBPAT evaluates BMP performance by linking a long-term hydrologic output from USEPA's Stormwater Management Model (SWMM) to a stochastic Monte Carlo water quality model to develop statistical descriptions of stormwater quantity and quality. The statistics generated in this process are then used to characterize the low (25^{th} percentile), average (mean), and high (75^{th} percentile) values for the annual volume, pollutant loads, and pollutant concentrations in stormwater runoff from the modeled area, with and without BMPs implemented. Water quality benefits are reported as the difference between Monte Carlo-derived statistics of the modeled area without BMPs and the same area with a specific suite of BMPs. Additional details regarding the modeling system are provided in **Section 4**.

The prioritization of regional BMPs considers the relative costs, benefits, and ease of implementation associated with each potential project. Potential projects yielding higher water quality benefits at lower costs will receive higher prioritization rank in instances where ease of implementation is considered to be comparable. Regional BMP projects that are constrained by engineering or site considerations and projects that are seen to be more challenging to implement may receive a lower priority rank than projects with similar costs and benefits with less significant constraints.

3.2.3.4 Process for Selecting Regional BMP Projects

The process of selecting the final list of regional BMPs was based on the prioritization results, RAA results, and agency input. The RAA quantifies the water quality benefits from quantifiable non-structural BMPs and distributed structural BMPs that are included in this WMP. The sum of load reductions from non-structural, distributed, and regional BMPs will then be compared with the target load reductions necessary for compliance with final TMDL limits for the purpose of reasonable assurance demonstration. BMP phasing (i.e., the planned implementation of some BMPs before others) will then be developed to meet the schedule of interim compliance milestones. The selection process and results are detailed in **Section 4.3.3**.

3.2.4 Summary of BMP Performance Data

The CASQA Development and Municipal BMP Handbook provides a general summary of BMP performance data within Southern California, which is summarized in **Table 3-7**.

Table 3-7 Treatment Control BMP Removal Efficiency

Pollutant of Concern	Treatment Control BMPs					
	Vegetated Swale/Strip	Catch Basin Screen/Insert	Hydrodynamic Separator	Infiltration Basin/Trench	Bioswale	Grease Trap
Sediment/ Turbidity/ Suspended Solids/ pH	High/Medium	High/Medium	High/Medium Low for Turbidity	High/Medium	High/Medium	Low
Nutrients	Low	Low	Low	High/Medium	Low	Low
Organic Compounds	Medium/Low	Low	Low	High/Medium	Medium	Low
Trash & Debris	Low	High/Medium	High/Medium	High/Medium	Low	Medium
Oxygen Demanding Substances	Low	Low	Low	High/Medium	Low	Low
Pathogens (Bacteria/ Viruses)	Low	Low	Low	High/Medium	low	Low
Oil & Grease	High/Medium	Medium	Medium/Low	High/Medium	High/Medium	Medium
Pesticides/PCBs	Medium	Low	Low	High/Medium	Medium	Low
Metals	High/Medium	Medium	Low	High	High/Medium	Low

3.3 Proposed Control Measures

Through the RAA iterative modeling process, detailed in **Section 4**, control measures were identified which will ensure compliance with applicable numeric limits in the time frame required by existing TMDLs. The types of control measures are outlined in this section, while the quantities are discussed in **Section 4**. Through the adaptive management process, the proposed control measures may change.

3.3.1 Proposed MCM/Institutional BMP Modifications

Based on input from the Regional Board, load reductions derived from non-modeled non-structural BMPs can be assumed to be five percent of baseline loads. Enhanced programs will be implemented in order to ensure they result in at least a five percent load reduction. These non-structural BMPs will include the following program enhancements (i.e., beyond the MS4 Permit minimum):

- Enhanced street sweeping
- Enhanced catch basin and storm drain cleaning
- Enhanced commercial and food outlet inspection
- Enhanced pet waste controls
- Enhanced education and outreach
- Enhanced homeless waste control efforts
- Enhanced Illicit Discharge Detection Elimination (IDDE) efforts

Potential non-structural BMP enhancements were identified in the Los Angeles River Reach 2 Metals TMDL Implementation Plan. **Table 3-8** provides potential enhancements associated with each of the programs listed above. Each LAR UR2 WMA City will have the flexibility to implement some or all of the enhancements, which do not have to be the same throughout the group.

3.3.2 Proposed Non-Stormwater Discharge Control Measures

Permit Attachment E Part IX introduces an aggressive non-stormwater outfall based screening and monitoring program. The LAR UR2 WMA CIMP describes how the non-stormwater screening program will be implemented. Given that the Rio Hondo is normally dry, or at least does not have flowing runoff, the LAR UR2 WMA anticipates that non-storm water discharge source assessment will result in the development of new control measures specific to the unique characteristics of the LAR UR2 WMA.

3.3.3 Proposed Structural Control Measures

The proposed structural control measures are discussed in greater detail in **Section 4.3.3**, including sizing and other design parameters. The proposed structural control measures include both distributed and regional BMPS. Distributed BMPs will be implemented throughout the watershed in accordance with the Planning and Land Development Program specified by the MS4 Permit. The types and sizes of these BMPs are not identified, but assumptions are provided to support the quantities incorporated into the RAA. LID Streets or Green Streets generally consist of bioretention system. These distributed BMPs will be implemented in LAR UR2 WMA as described in **Section 4.3.3**.

Six regional projects have been identified through the development, as listed below. The design details associated with the projects will be determined in the future, but as currently conceptualized include infiltration trenches, infiltration basins, and subsurface infiltration systems.

- Randolph Street Green Rail Trail;
- LADWP Transmission Easement;
- John Anson Ford Park;
- Rosewood Park;
- Lugo Park; and
- Salt Lake Park.

Table 3-8 Potential Non-Structural BMP Enhanced Implementation Efforts

Non-Structural BMP Program	Proposed Implementation Approach
Street Sweeping	Consider more frequent street sweeping
	Consider modified enforcement strategies
	Consider requiring sweepers to travel at slower speeds
	Consider sweeping medians of larger streets
	Consider contractually mandating the use of regenerative vacuum equipment
Catch Basin and Storm Drain Cleaning	Consider enhanced catch basin cleaning for catch basins with CPS
	Consider modifying the extent, timing, and frequency of cleaning
	Consider conducting study to evaluate opportunities to enhance/modify program and consider implementing based on the findings
Commercial and Food Outlet Inspection	Consider targeted outreach effort related to bacterial discharges
	Consider developing and enforcing ordinances
	Consider focusing education and Business Assistance Program
	Consider increasing inspection and enforcement of grease removal equipment
Pet Waste Controls	Consider developing and enforcing ordinances
	Consider targeted outreach effort
	Consider using various media outlets
Education and Outreach	Consider targeted outreach efforts
	Consider alternative media outlets
	Consider conducting study to evaluate opportunities to enhance/modify program and consider implementing based on the findings
Homeless Waste Control	Consider developing and implementing program to reduce homelessness
	Consider ordinances that reduce encampments
	Consider targeted enforcement during evening hours
IDDE	Consider developing and implementing ordinances that include enforcement actions and accelerated follow up inspections
	Consider conducting study to evaluate opportunities to enhance/modify program and consider implementing based on the findings

4. Reasonable Assurance Analysis

The purpose of the RAA is to demonstrate that the implementation scenarios proposed in the WMP will meet the MS4 Permit effluent and receiving water limits for the priority pollutants of concern identified in **Section 2**. The WQOs are specified in the TMDLs and included in **Appendix C**, along with other MS4 Permit limitations for each WBPC addressed in the WMP. The limiting pollutant used to control the implementation efforts of the LAR UR2 WMA is bacteria for the area draining to the Los Angeles River and metals for the area draining to the Rio Hondo. Bacteria and metals were determined to be the limiting pollutants because they meet the following criteria:

- Relatively high priority with respect to meeting TMDL WLAs and/or other WQOs;
- Conservative with respect to attenuation during fate and transport modeling; and
- Require the greatest amount of volumetric control to achieve TMDL WLAs and other objectives.

This section summarizes the modeling approach that was carried out as part of the greater RAA development effort, specifically the process of:

- Setting target load reductions based on MS4 Permit limitations;
- Modeling identified structural BMPs and quantifying their associated load reductions;
- Demonstrating, with reasonable assurance, that target load reductions (and therefore MS4 Permit limitations) can be met by the final compliance dates; and
- Phasing of structural and non-structural BMPs to achieve interim milestones.

The RAA modeling approach presented herein conforms to Part VI.C.5.b.iv(5) of the MS4 Permit, which states:

> *"Permittees shall conduct a Reasonable Assurance Analysis for each water body-pollutant combination addressed by the [WMP]. [The] RAA shall be quantitative and performed using a peer-reviewed model in the public domain. Models to be considered for the RAA, without exclusion, are the Watershed Management Modeling System (WMMS), Hydrologic Simulation Program-FORTRAN (HSPF), and the Structural BMP Prioritization and Analysis Tool (SBPAT. The objective of the RAA shall be to demonstrate the ability of [the WMP] to ensure that Permittees' MS4 discharges achieve applicable water quality based effluent limitations and do not cause or contribute to exceedances of receiving water limitations."*

The Regional Board has developed a guidance document titled, "Guidelines for Conducting Reasonable Assurance Analysis in a Watershed Management Program, Including an Enhanced Watershed Management Program (March 25, 2014)." Although the guidance document presents guidelines and not necessarily requirements, the results of the RAA presented in this WMP have been developed to conform to the Regional Board guidance document. The approach described was presented to the Regional Board by Geosyntec on April 9, 2014 (Geosyntec, 2014) and was found to be consistent with their guidelines.

4.1 Modeling System

The RAA approach leverages the strengths of publicly available, MS4 Permit-approved GIS-based models that are widely utilized including within this region. The decision to use these models in the manner described below was based on the unique characteristics of the LAR UR2 WMA in regards to water quality priorities, hydrologic processes, and BMP opportunities, as well as to the capabilities of the models approved by the MS4 Permit.

Loading Simulation Program in C++ (LSPC), a publically available watershed model that uses Hydrologic Simulation Program - FORTRAN (HSPF) algorithms to simulate hydrology, sediment transport, water quality, and the fate and transport of pollutants within receiving waters and through a watershed. GIS was also used for the spatial component of the analysis as well as general visualization.

SBPAT is a public-domain GIS-based water quality analysis tool used to evaluate structural BMP performance for the purposes of this RAA. SBPAT links a modified USEPA SWMM hydrologic engine to a Monte Carlo analysis capable of repeated random sampling of pollutant EMCs and BMP effectiveness distributions to obtain numerical results regarding the expected performance of a specific BMP configuration. Each Monte Carlo analysis typically involves 10,000 iterations of EMC distributions and BMP effluent concentrations from the International BMP Database. SBPAT's land use EMCs are presented in Table 5. SBPAT is capable of quantifying model output variability, which is a component of the Regional Board's recent RAA guidance. The model:

- Calculates and tracks inflows to BMPs, treated discharge, bypassed flows, evaporation, and infiltration at a user-defined time step (e.g., 15 minutes);
- Distinguishes between individual runoff events by defining six-hour minimum inter-event times in the rainfall record, yet tracks inter-event antecedent conditions;
- Tracks volume treated by BMPs and summarizes and records these metrics by storm event; and
- Produces a table of each BMP's hydrologic performance, including concentration and load metrics by storm event, and consolidates these outputs on an annual basis.

SBPAT is specifically referenced in the MS4 Permit Part VI.C.5.b.iv and was presented at the first two MS4 Permit Group TAC RAA Subcommittee meetings. Additional information regarding SBPAT can be found in the SBPAT portal (SBPAT, 2013a).

Table 4-1 SBPAT RAA EMCs - Arithmetic Estimates of the Lognormal Summary Statistics

Land Use	TSS (mg/L)	TP (mg/L)	DP (mg/L)	NH3 (mg/L)	NO3 (mg/L)	TKN (mg/L)	DCu (µg/L)	TCu (µg/L)	TPb (µg/L)	DZn (µg/L)	TZn (µg/L)	FC (#/100mL)
Agriculture (row crop)	999.2 (648.2)	3.34 (1.53)	1.41 (1.04)	1.65 (1.67)	34.40 (116.30)	7.32 (3.44)	22.50 (17.50)	100.1 (74.8)	30.2 (34.3)	40.1 (49.1)	274.8 (147.3)	60,300 (153,000)
Commercial	67.0 (47.1)	0.40 (0.33)	0.29 (0.25)	1.21 (4.18)	0.55 (0.55)	3.44 (4.78)	12.3 (10.2)	31.4 (25.7)	12.4 (34.2)	153.4 (96.1)	237.1 (150.3)	51,600 (173,400)[a]
Education (Municipal)	99.6 (122.7)	0.30 (0.17)	0.26 (0.2)	0.4 (0.99)	0.61 (0.67)	1.71 (1.13)	12.2 (11.0)	19.9 (13.6)	3.6 (4.9)	75.4 (52.3)	117.6 (83.1)	11,800[b] (23,700)
Industrial	219.2 (206.9)	0.39 (0.41)	0.26 (0.25)	0.6 (0.95)	0.87 (0.96)	2.87 (2.33)	15.2 (14.8)	34.5 (36.7)	16.4 (47.1)	422.1 (534.0)	537.4 (487.8)	3,760 (4,860)
Multi-Family Residential	39.9 (51.3)	0.23 (0.21)	0.20 (0.19)	0.50 (0.74)	1.51 (3.06)	1.80 (1.24)	7.40 (5.70)	12.1 (5.60)	4.5 (7.80)	77.5 (84.1)	125.1 (101.1)	11,800[c] (23,700)
Single Family Residential	124.2 (184.9)	0.40 (0.30)	0.32 (0.21)	0.49 (0.64)	0.78 (1.77)	2.96 (2.74)	9.4 (9.0)	18.7 (13.4)	11.3 (16.6)	27.5 (56.2)	71.9 (62.4)	31,100[d] (94,200)
Transportation	77.8 (83.8)	0.68 (0.94)	0.56 (0.82)	0.37 (0.68)	0.74 (1.05)	1.84 (1.44)	32.40 (25.5)	52.2 (37.5)	9.2 (14.5)	222.0 (201.7)	292.9 (215.8)	1,680 (456)
Vacant/Open Space	216.6 (1482.8)	0.12 (0.31)	0.09 (0.27)	0.11 (0.25)	1.17 (0.79)	0.96 (0.9)	0.60 (1.90)	10.6 (24.4)	3.0 (13.1)	28.1 (12.9)	26.3 (69.5)	484 (806)

Note: EMC statistics are calculated based on 1996-2000 data for Los Angeles County land use sites (Los Angeles County, 2000), except for agriculture which are based on Ventura County MS4 EMCs (Ventura County, 2003) and fecal coliform which are based on 2000-2005 SCCWRP Los Angeles region land use data (SCCWRP, 2007b). These EMC datasets are summarized in the SBPAT User's Guide (Geosyntec, 2012).

[a] The default log distribution best fit summary statistics for this land use-pollutant combination produced an unreasonably high deviation, therefore the arithmetic estimate of the log mean was held constant while the log summary statistics were recomputed based on the log CoV for SFR (SCCWRP's low-density residential EMC).

[b] Multi-family residential EMC used here since educational land use site not available in the SCCWRP fecal coliform dataset.

[c] The fecal coliform EMC for the multi-family residential land use is based on SCCWRP dataset for "high-density residential"

[d] The fecal coliform EMC for the single-family residential land use is based on SCCWRP's dataset for "low-density residential".

4.2 Modeling Approach

This section gives an overview of the modeling approach, while the findings and results identified using this approach are described in **Section 4.3**. The modeling approach involves the establishment of target load reductions and the evaluation of non-structural and structural BMP pollutant load reductions. In addition, load reductions associated with non-MS4 parcels must also be established.

4.2.1 Establish Target Load Reductions

This initial step established target pollutant load reductions for the water quality priorities identified in **Section 2**, which includes applicable TMDL and 303(d)-listed pollutants (excluding trash) for the LAR UR2 WMA compliance modeling locations. It is possible that for some pollutants, such as nutrients, no MS4 load reduction relative to existing conditions would be necessary to meet the TMDL-based compliance requirements. The compliance modeling locations will consist of a location in Los Angeles River Reach 2 (or Segment B in the bacteria TMDL) and another in the lower Rio Hondo tributary.

The target load reductions represent a model-able expression of the MS4 Permit compliance metrics (e.g., bacteria allowed exceedance days for dry- and wet-weather), and serve as a basis for confirming that the WMP reasonably assures compliance with the MS4 Permit through quantitative analyses. Target load reductions were established using the calibrated LSPC watershed model for the TMDL pollutants total nitrogen, total copper, total lead, total zinc, and fecal coliform. LSPC does not model TMDL pollutants nitrate, nitrate plus nitrite, ammonia (total nitrogen will be used as a surrogate for all regulated nitrogen species), total cadmium (copper, lead, and zinc will be used as surrogates), or E. coli (fecal coliform will be used as a surrogate).

Land use loadings were reduced in LSPC until daily average pollutant concentrations at the compliance modeling locations met concentration or (single sample) exceedance day-based limits. Alternatively, daily maximum values may be used, however such an approach is considered overly conservative. The resulting load reductions that were found necessary to meet the MS4 Permit limits became the target load reductions that BMP benefits were modeled against. For bacteria, the wet-weather allowable exceedance days include High Flow Suspension (HFS) days.

4.2.2 Evaluate Non-Structural BMP Pollutant Load Reductions

Existing recently-initiated non-structural BMPs (i.e., those that have been initiated post-TMDL effective date) and planned non-structural BMPs were evaluated in terms of ability to reduce loads at the two compliance modeling locations. Both wet- and dry-weather water quality benefits of these BMPs were evaluated for all TMDL and 303(d) pollutants (excluding trash) where data was available to support such estimates.

Non-structural BMP load reductions include redevelopment (i.e., implementation of the MS4 Permit's post-construction retention and treatment requirements), Industrial General Permit compliance (i.e., stormwater discharge permittees meeting TMDL limits), and other non-structural BMPs, such as MCMs/institutional BMPs. Load reductions were quantifiable based on available BMP performance data and literature. These assumptions are documented in **Section**
4.3.2. For example, the load reductions resulting from phase-out of copper in brake pads and of zinc in rubber tires (assuming implementation of Department of Toxic Substances Control's (DTSC's) Safer Consumer Product Regulations, and inclusion of zinc in tires in the Priority Products list) was determined based on recent quantitative mass balance estimates developed by Kelly Moran for CASQA's True Source Control subcommittee. As another example, bacteria and dry-weather runoff reduction BMPs were quantified consistent with methodologies employed in recent San Diego Combined Load Reduction Plans

(examples available online (SBPAT, 2013b)). **Figure 4-1** shows a general schematic of non-structural BMP load reduction quantification through an example using pet waste programs.

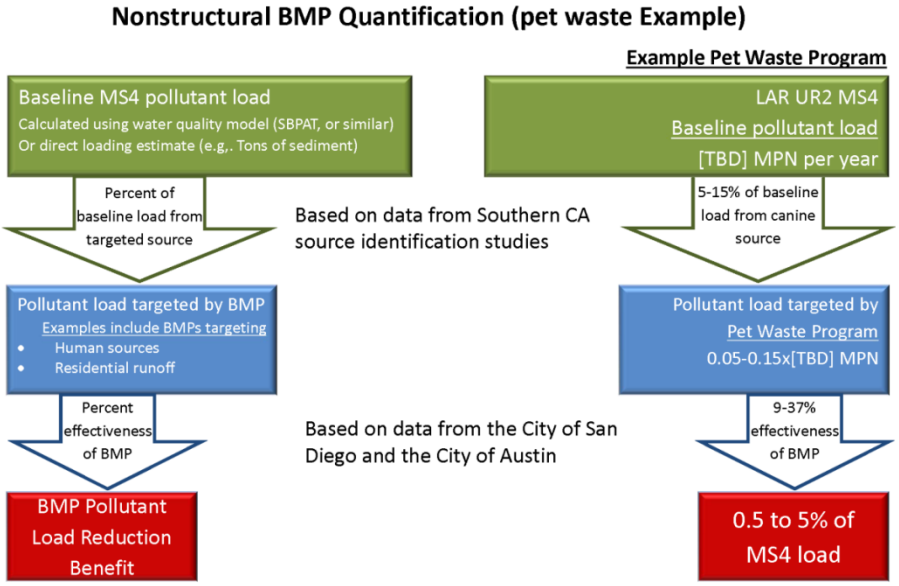


Figure 4-1 Non-Structural BMP Quantification (San Diego Pet Waste Example)

To avoid double-counting of load reductions where non-structural and structural BMPs overlap, the greater load reduction was applied.

4.2.3 Evaluate Structural BMP Pollutant Load Reductions

The goal of this step is to achieve the remaining target load reductions needed after accounting for the benefits of non-structural BMPs. Existing jurisdictional boundaries, as well as subwatershed and conveyance facility characteristics, were considered to delineate pollutant source, runoff control, and outfall monitoring strategies. This involved a detailed review of existing conditions and datasets.

Existing (i.e., implemented post-TMDL) and planned structural BMPs were provided by the agencies with sufficient conceptual design detail to support quantitative analysis. The additional "proposed" structural BMPs opportunities were identified and prioritized using SBPAT's structural retrofit planning methodology. Structural BMPs were modeled iteratively for the final TMDL compliance scenario (interim compliance milestone scenarios, were quantified by summing load reductions of phased BMP subsets as required). The final TMDL compliance scenario reflects the dates in which the final TMDL limits become effective. Milestones and final scenario dates for pacing water quality control measure implementation and iterative adaptive management reanalysis are (assuming the responsible parties implement the LRS approach for the bacteria TMDL):

- October 1, 2015 (final WQBEL - trash TMDL)
- January 11, 2020 (75% dry-weather WQBEL - metals TMDL)
- January 11, 2024 (final dry-weather, 50% wet-weather WQBEL - metals TMDL)
- January 11, 2028 (final wet-weather WQBEL metals TMDL)
- September 23, 2028 (Los Angeles River Segment B dry-weather second phase WQBEL - bacteria TMDL)
- March 23, 2030 (Rio Hondo dry-weather second phase WQBEL - bacteria TMDL)
- March 23, 2037 (final wet-weather WQBEL and RWL - bacteria TMDL)

The water quality benefits (in terms of expected pollutant load reductions) associated with existing, planned, and proposed structural BMPs were evaluated for wet-weather using SBPAT, consistent with methods used in previous TMDL Implementation Plans and Combined Load Reduction Plans. SBPAT uses recent effluent quality data from the WERF/EPA/ASCE International Stormwater BMP Database (www.bmpdatbase.org) to characterize structural BMP performance for all TMDL and 303(d)-listed pollutants of concern, based on available data. SBPAT estimates pollutant load reductions by comparing "existing" loads (corresponding to the effective date of the TMDL) with "post-BMP implementation" loads. Load estimates for the existing condition rely primarily on hydrology (which is modeled in SBPAT using UESPA's SWMM and Los Angeles region land use EMCs).

Following evaluation of the water quality benefits associated with these BMPs, the remaining need in terms of additional pollutant load reductions required to achieve the target load reductions was calculated to determine whether additional BMPs are needed to demonstrate Reasonable Assurance.

Estimated load reductions were compared with the target pollutant load reductions and were used to assess compliance with both load-based and exceedance day-based TMDL compliance metrics. Expected pollutant reduction ranges were provided, thereby capturing the variability of BMP performance, and reflecting the specific compliance risk tolerance of the LAR UR2 WMA.

For dry-weather (which includes days with <0.1-inch rainfall as defined by the Los Angeles River Bacteria TMDL), structural BMP quantification is based on static volume and load reduction calculations. An example of a static mass or volume balance calculation would be for characterizing the effects of overspray irrigation control programs (e.g., water conservation outreach and incentives) in combination with a number of low flow diversion (to sewer) projects, which together may be estimated to reduce 100 percent of dry-weather discharge volumes for the entire drainage area tributary to the implementation sites. This was done consistent with methods employed for recent TMDL Implementation Plans and Combined Load Reduction Plans, and took into account local knowledge and data provided for dry-weather runoff sources and discharge locations within LAR UR2 WMA. For pollutants that are covered within the RAA, but lack data to support a quantitative modeling analysis, surrogate pollutants were used to estimate load reductions (e.g., TSS for particulate-associated toxicants). Non-stormwater pollutants (e.g., pH, cyanide, ammonia), as determined by the water quality prioritization and source assessment presented in **Section 2**, as well as trash were not addressed by the RAA.

4.3 Modeling Process

This section goes into greater detail regarding the RAA completed using the approach described in **Section 4.2**, while the final RAA output is provided in **Section 4.4**.

4.3.1 Target Load Reductions

The Determination of Target Load Reductions began with a January 30, 2014 meeting with Board staff to clarify our assumptions and approach to conducting the RAA. Based on staff comments, we began by identifying the 90th percentile rain event years, then determined baseline pollutant loads based on those years, and made a determination of allowable loads for both the LAR and Rio Hondo based on TMDL and MS4 Permit requirements. The difference between the baseline and allowable loads then became the Target Load Reduction which must be reduced through the imposition of watershed control measures. The final step is an iterative adaptive management process, which will be subject to changing information and experience with the modeling methods and RAA assumptions. As an example, the current land use EMCs are primarily derived from data developed around the time that the 2001 MS4 Permit was just being implemented. Although models have been used to determine watershed pollutant loads,

approximately 40% of the Los Angeles River watershed, as a whole, follows a reduced street sweeping schedule, as compared to the enhanced weekly schedule, followed by the LAR UR2 WMA Permittees.

4.3.1.1 90th Percentile Years for Bacteria and Metals

The Regional Board's RAA Guidance document requires that RAAs consider critical conditions when evaluating structural and non-structural BMPs. Additional communication with the Regional Board indicated that two separate methods could be used to establish critical or 90th percentile years for different pollutant classes. Based on Regional Board guidance, the 90th percentile year was established for bacteria by applying the regulatory definition of a wet day, a calendar day with precipitation greater than 0.1-inch and the three days that follow, to the period of record for a representative rain gage, ranking years by the number of wet days, and identifying the 90th percentile TMDL year based on the number of wet days. The year representing the critical condition for all other pollutants under consideration, specifically metals and nutrients, was established by summing rainfall totals by TMDL year and identifying the corresponding 90th percentile year based on annual rainfall depths.

Subwatersheds within LSPC are assigned a rain gage reflecting thiessen polygons or areas of influence for each precipitation gage within the model. LACFCD's South Gate Transfer Station (D1256) is associated with the largest unit area within the WMA, as demonstrated in **Figure 4-2** and was therefore assumed to be representative of atmospheric conditions for the sub-region. The period of record for the gage is 1986-2011. The 90th percentile year for bacteria and metals are outlined in **Table 4-2**.

Table 4-2 90th Percentile Years for Limiting Pollutants

Pollutant	TMDL Year	Year Definition
Bacteria[1]	2011	November 1, 2010 - October 31, 2011
Metals and Nutrients[2]	1995	November 1, 1994 - October 31, 1995

[1] Applicable to area directly draining to Los Angeles River
[2] Applicable to area directly draining to Rio Hondo

4.3.1.2 Baseline Loads

In order to determine the baseline loads, the default Los Angeles County scale LSPC model was revised to reflect the subwatershed portions that fall within the LAR UR2 WMA as defined by the Regional Board. **Figure 4-3** presents LSPC model catchments, storm drains, and receiving waters for the WMA.

In order to establish baseline pollutant loads, a single model run without any BMPs or treatment control measures was carried out for both the Los Angeles River and Rio Hondo sides of the LAR UR2 WMA. Bacteria loads were extracted for the 2011 TMDL year while metals and nutrient loads were isolated for the 1995 TMDL year. Baseline loads for copper, lead, zinc, total nitrogen, and fecal coliform (used as the representative fecal indicator bacteria parameter) are reported in **Table 4-3**.

Table 4-3 Baseline Loads Derived from LSPC for 90th Percentile Model Years

Receiving Water Segment	Total Copper (lbs)	Total Lead (lbs)	Total Zinc (lbs)	Fecal Coliform (MPN*10^12)	Total Nitrogen (lbs)
Los Angeles River	672	536	6,784	997	99,952
Rio Hondo	147	105	1,594	181	23,183

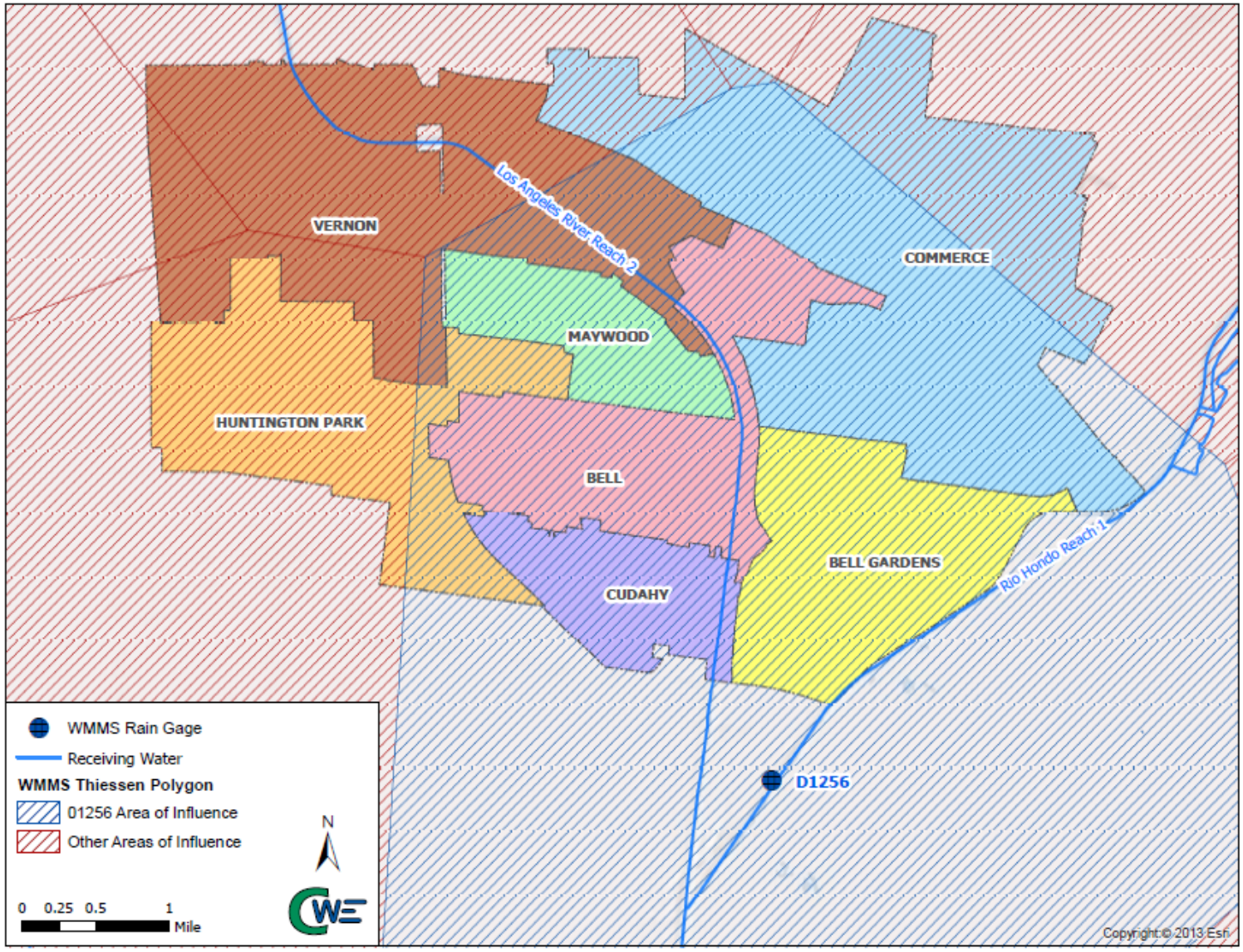


Figure 4-2 LAR UR2 WMA LSPC/HSPF Thiessen Polygons

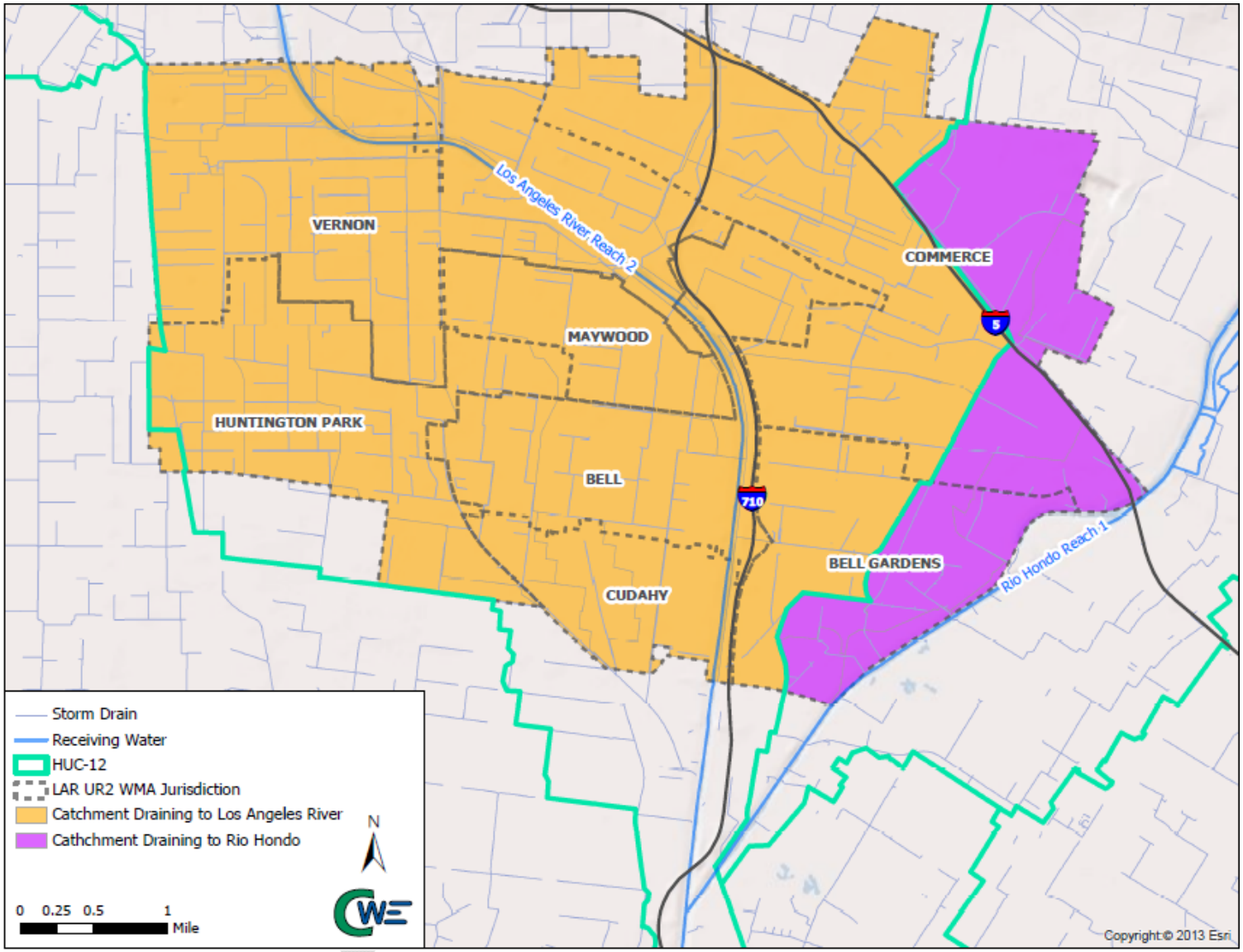


Figure 4-3 LSPC Model Catchments, Storm Drains, and Receiving Waters

4.3.1.3 Allowable Loads for Metals and Nutrients

Allowable loads for metals and nutrients were computed by multiplying relevant concentration-based WQBELs or SSOs by LSPC-derived runoff volumes for the periods modeled. Copper, lead, zinc, and nitrogen WQBELs are identified in Attachment O of the MS4 Permit, and provided in **Appendix C**. Copper and lead SSOs presented in the Draft Los Angeles River Copper and Lead Special Study Implementation Report (Larry Walker and Associates, 2013) were used in place of the WQBELs presented in the MS4 Permit for a parallel allowable load scenario. The concentration-based WQBELs that were used to set allowable loads are as follows:

- Total Copper: 15 µg/L;
- Total Lead: 56 µg/L;
- Total Zinc: 140 µg/L; and
- Total Nitrogen: 10.4 mg/L (based on sum of nitrate and ammonia WQBELs [8 mg/L + 2.4 mg/L], and assuming zero organic nitrogen).

SSOs used for the alternative allowable loads for copper and lead are as follows:

- Total Copper: 60 µg/L (3.971 Water Effects Ratio), and
- Total Lead: 85 µg/L

Table 4-4 shows the allowable loads for metals and nitrogen which may not exceed the baseline loads, shown in parenthesis, derived from the Los Angeles County scale LSPC model. Where allowable loads exceed baseline loads (e.g. values subject to SSOs), allowable loads are set equal to baseline loads.

Table 4-4 Allowable Loads Derived for 90th Percentile Model Years (SSO-Derived Allowable Loads in Parenthesis)

Receiving Water Segment	Total Copper (lbs)	Total Lead (lbs)	Total Zinc (lbs)	Total Nitrogen (lbs)
Los Angeles River	464 (672)	536 (536)	4,342 (NA)	99,952 (NA)
Rio Hondo	88 (147)	105 (105)	813 (NA)	23,183 (NA)

NA = Not applicable (no SSO available)

4.3.1.4 Allowable Loads for Bacteria

Permit limitations for bacteria are expressed in terms of allowable exceedance days (i.e., number of wet days with instream fecal coliform concentrations above 400 MPN/100 mL, minus ten reference stream-based allowed exceedance days and 15 days during which the high flow recreational use is suspended for 2011 [i.e., days with rainfall greater than or equal to 0.5 inches]). The allowable exceedance days were used to directly calculate target load reductions (described in the next section). Allowable loads (**Table 4-5**) for bacteria for the 90th percentile year were calculated by subtracting target load reductions from baseline loads.

Table 4-5 Allowable Loads for 90th Percentile Model Years for Bacteria

Receiving Water Segment	Fecal Coliform (MPN*10^12)
Los Angeles River	708
Rio Hondo	125

4.3.1.5 Target Load Reductions

Target Load Reductions (TLRs) are the reduction of baseline loads needed to achieve MS4 Permit WQOs. TLRs (**Table 4-6**) were calculated as the difference between baseline loads and allowable loads, for all pollutants except bacteria.

TLRs for bacteria were established as the load reduction from baseline conditions that are required to decrease the number of wet-weather exceedance days (i.e., days with receiving water concentrations above 400 MPN/100mL) in the 90th percentile bacteria year (2011) to the MS4 Permit's allowable exceedance days, or ten allowed days (excluding high flow recreational use suspension days, or days with rainfall greater than or equal to 0.5 inches and the following 24 hours). In order to calculate the required load reductions, SBPAT was used to model hypothetical infiltration basins located at the outlets of the Los Angeles River and Rio Hondo drainage areas. The two basins were iteratively sized until modeled receiving water exceedance days meet the allowed number. This is achieved through elimination of discharge on non-allowed exceedance days. The fecal coliform target load reductions (**Table 4-6**) were then set to the load reductions that were achieved by these hypothetical infiltration basins.

For lead and total nitrogen, no load reductions were needed for baseline loads to meet allowable loads, therefore TLRs were zero. The same is true for copper with SSOs considered.

For copper (without SSOs) and zinc, TLRs as a percentage of baseline loads vary from 31-49 percent. For bacteria, TLRs as a percentage of baseline loads vary from 29-31 percent.

Table 4-6 TLRs for 90th Percentile Model Years, with SSO-based LTRs in Parenthesis

Receiving Water Segment	Total Copper (lbs)	Total Lead (lbs)	Total Zinc (lbs)	Fecal Coliform (MPN*10^12)	Total Nitrogen (lbs)
Los Angeles River	209 (0)	0	2,442	289	0
Rio Hondo	59 (0)	0	781	56	0

4.3.2 Non-Structural BMP Modeling Assumptions

In order to take credit in the load reductions that will result from non-structural BMP implementation, the load reductions had to be quantified and justified. Load reductions were incorporated into the model for various types of non-structural BMPs, including the following:

- Non-MS4 NPDES Permittee Parcels
- Senate Bill (SB) 346 Copper Load Reductions
- Non-Modeled Non-Structural BMPs

4.3.2.1 Non-MS4 NPDES Facility Parcels

In addition to MS4 Permittees, such as those agencies that make up the LAR UR2 WMA, there are several other groups of NPDES Permittees that are responsible for ensuring that their own discharges are in compliance with the various TMDL WLAs including WQBELs. These include Individual NPDES, General NPDES, General Industrial NPDES and General Construction NPDES facilities or sites. With the exception of the General Construction Permittees, which constantly change, the remaining NPDES Permittees are long lasting and are generally attributable to the industrial, commercial and manufacturing land uses categories and are therefore attributed with high pollutant loadings that may adversely skew the results of a RAA.

For each of the LAR UR2 WMA General Industrial Permittees identified in SMARTS, public stormwater information including Enforcement Actions, NOI, Annual Reports, and Monitoring Reports, were reviewed. **Appendix H** provides tables summarizing key characteristics of these facilities include area and SIC codes. Each facility was then mapped, as illustrated in **Figure 4-4**, by translating from street address to Los Angeles County Assessor Identification Number (AIN) using ArcGIS. These mapped parcels represent "Non-MS4 NPDES Facilities" within each City and were modeled as non-structural BMPs through applicable load reductions.

By modeling these parcels as non-structural BMPs, the analysis took into account the compliance of independently permitted facilities, which would normally have high pollutant loadings. These pollutant concentrations, or land use based loadings, were set equivalent to the WQBELs (arithmetic summary statistics shown in **Table 4-7**), to reflect the assumption that stormwater runoff from these sites will generally comply with the water quality standards. For characterization of variability, the coefficients of variation for the industrial EMCs were preserved.

Two SBPAT model runs were carried out to quantify load reductions derived from this BMP. The first model run reflected the baseline scenario with land use specific EMCs presented in **Table 4-7** applied uniformly across LAR UR2 WMA. The second model run represented the land use dataset with non-MS4 parcels included (i.e., their EMCs set to WQBELs).

Table 4-7 Non-MS4 NPDES Facility Parcel's Land Use EMCs (arithmetic estimates of log means)

Land Use	TCu (µg/L)	TZn (µg/L)	FC (# /100 mL)
Non-MS4 NPDES Facility Parcels	21.9 (23.3)	189 (172)	653 (843)

Note: SBPAT assumes lognormal distributions for its water quality input datasets. SBPAT's log mean values for the new non-MS4 NPDES Facility parcel land use were set to the log of the WQBEL concentrations (i.e., 15 µg/L for total copper, 140 µg/L for total zinc, and 400 MPN/100mL for fecal coliform); log standard deviations (in parentheses) were scaled based on the industrial EMC COVs. This table reports arithmetic estimates of the log summary statistics; i.e., the log mean and log standard deviations were converted into arithmetic space using statistical conversion equations.

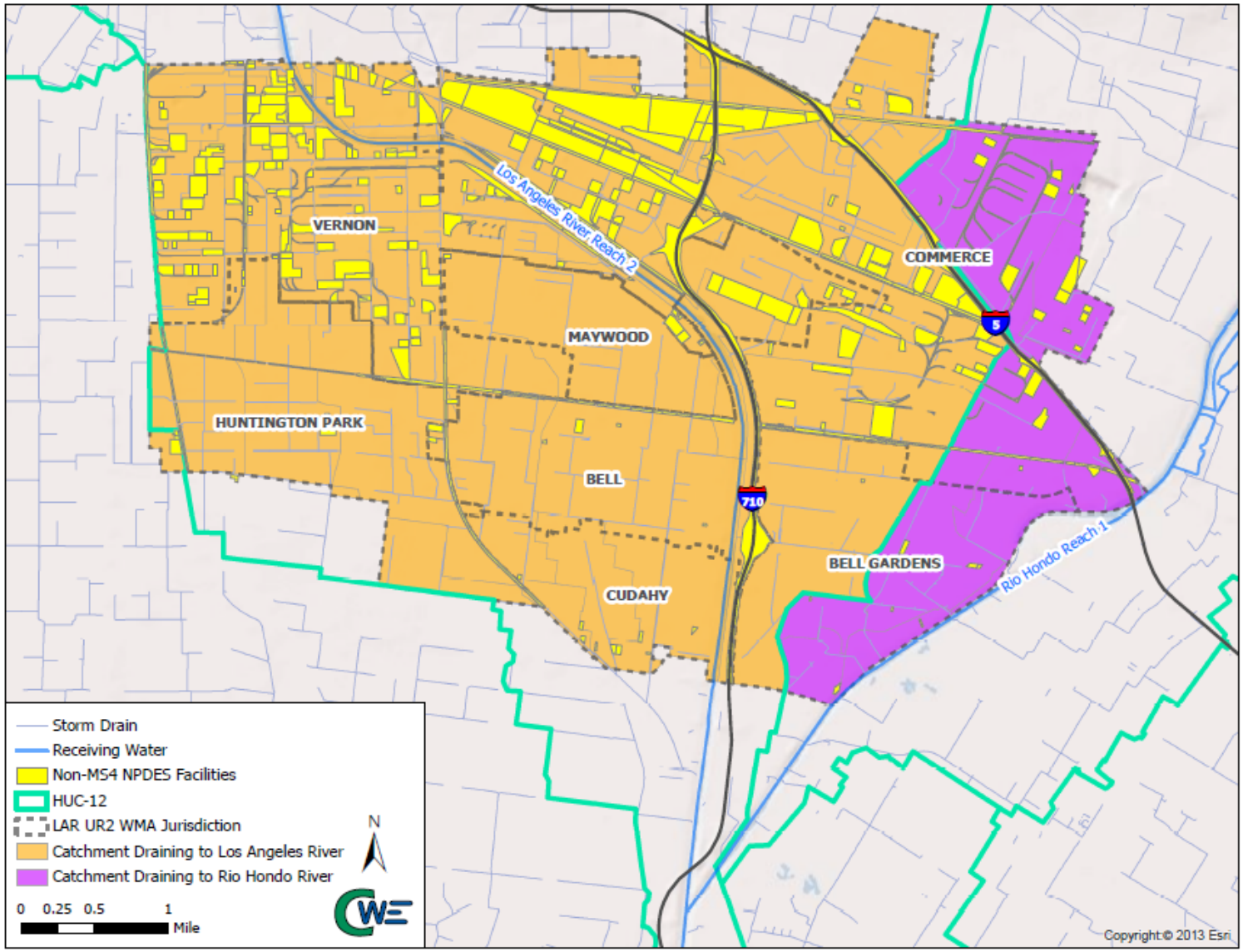


Figure 4-4 Non-MS4 NPDES Permittees in LAR UR2 WMA

4.3.2.2 SB 346 Copper Load Reductions

Car brake pad debris has been shown to be the source of approximately 60 percent of total copper loads into highly urbanized watersheds throughout California (Donigian, 2009 as cited by Moran, 2013). A study conducted by AquaTerra in 2007 attributed 15 to 50 percent of total copper loads to the San Francisco Bay to brake pad wear debris from a range of land uses. A similar study carried out by the Santa Clara Valley Urban Runoff Program attributed 42 percent of copper loading to the same water body to brake pad wear (SCVURP, 1997).

California SB 346 mandates reduction in copper composition of brake pads sold in California such that each pad must be comprised of less than 5 percent of copper by weight in 2021 and 0.5 percent of copper by weight in 2025. A CASQA funded study developed by TDC Environmental (Moran, 2013) carried out a series of mass balance assessments to estimate the percentage of copper loading that would occur as a result of SB 346 driven changes. The study assessed three scenarios accounting for uncertainty in manufacturer response and projected load reductions from baseline for years of interest for the MS4 Permit compliance in Los Angeles County. These scenarios and years of interest are presented in **Table 4-8**.

Table 4-8 Estimated Runoff Copper Reduction from Friction Pad Reformulation (Adapted from Moran, 2013)

Year	Scenario 1 - One Step Reduction	Scenario 2 - Step Reduction	Scenario 3 - Aftermarket Exemption from 0.5% Copper
2020	29%	17%	17%
2024	60%	45%	39%
2028	61%	60%	49%
2032	61%	61%	55%

For the LAR UR2 WMA RAA, a 50 percent reduction in copper loading was conservatively assumed to occur by the 2028 final metals milestone. To avoid double counting, this reduction was applied to the remaining copper load after all structural BMP load reductions were accounted for.

4.3.2.3 Non-Modeled Non-Structural BMPs

Load reductions derived from non-modeled, non-structural BMPs were assumed to be 5 percent of baseline loads for all pollutants following discussions with the Regional Board. These non-structural BMPs will include the following program enhancements (i.e., beyond the Permit minimum), with an emphasis on those BMPs that most effectively target urban stormwater bacteria sources: enhanced street sweeping, enhanced catch basin and stormdrain cleaning, enhanced commercial and food outlet inspection, enhanced pet waste controls, enhanced education and outreach, enhanced homeless waste control efforts, and enhanced IDDE efforts (including microbial source tracking to identify inputs of human fecal contamination into the MS4). Additional details regarding the enhancements are presented in **Section 3.3.1**.

4.3.3 Structural BMP Modeling Assumptions

In order to take credit in the load reductions that will result from structural BMP implementation, the load reductions had to be determined. Load reductions were quantified by the model for the proposed structural BMPs, based on specified design criteria. Assumptions for the following structural BMP implementation are discussed in greater detail below:

- LID Ordinances
- LID Streets or Green Streets (Distributed BMPs)
- Regional BMPs

4.3.3.1 Low Impact Development Ordinances

Implementation of LID as a result of redevelopment was modeled uniformly throughout the LAR UR2 WMA. MS4 Permit Part VI.C.4.c.i.(1) requires Permittees to develop and implement a LID ordinance applicable to redevelopment meeting minimum criteria thresholds of disturbance. Average annual redevelopment rates released by the City of Los Angeles (City of Los Angeles Bureau of Sanitation, 2009) were used to establish what area within each land use is expected to be retrofitted consistent with the Permit's post-construction onsite retention requirements. Average annual redevelopment rates were extrapolated to final compliance dates, or 2028 for metals and 2037 for bacteria. In an April 16, 2014, memorandum to the MS4 Permittees, the LARWQCB Executive Officer asserted that the Permit required final LID ordinances to be in place by the time of WMP submittal. The area redeveloped each year was sampled without replacement; i.e., areas that had undergone redevelopment in previous years were not available to undergo redevelopment again in subsequent years. Average annual redevelopment rates for relevant land uses and cumulative redevelopment for pollutant-specific TMDL compliance dates are presented in **Table 4-9**.

Table 4-9 Redevelopment Rates by Land Use

Land Use	Average Annual Percent Area that is Redeveloped	Percent of Total Area that is Redeveloped by Milestone Year	
		Metals Compliance Date (2028)	Bacteria Compliance Date (2037)
Commercial	0.15	2.1	3.4
Education	0.16	2.2	3.6
Industrial	0.34	4.7	7.5
Residential	0.18	2.5	4.1
Transportation	2.7	31.8	46.7

Areas treated by LID as a result of the ordinances were modeled using bioretention systems sized for the 85th percentile storm depth for the region of 0.97-inch (LACDPW, 2004) with a saturated hydraulic conductivity (K_{sat}) of 0.15 inch per hour.

4.3.3.2 LID Streets

LID Streets were applied to treat 25 percent of commercial and residential land uses in areas that were not tributary to proposed regional BMPs on the Los Angeles River side of LAR UR2 WMA. LID Streets are different from the arterial Green Streets indentified in the Permit and Green Streets Policy in that LID Streets are more comparable to distributed parcel level BMPs within the public Right of Way (ROW). LID Streets will be implemented on smaller street projects which do not trigger the requirements of the Green Streets Policy. LID Streets were not necessary to meet TLRs on the Rio Hondo side of LAR UR2 WMA and they are only proposed for implementation in LAR UR2 WMA areas that drains directly to the Los Angeles River. **Table 4-10** identifies the cumulative area within each LAR UR2 WMA City that will be tributary to a LID Street based on the afore mentioned assumptions. LID Street treatment was modeled using bioretention systems sized for the 0.4-inch storm (sizing was identified through iterative analysis) with a saturated hydraulic conductivity (K_{sat}) of 0.15 inch per hour.

Table 4-10 LID Street Required Tributary Area by LAR UR2 WMA City

LAR UR2 WMA City	SF Residential (acres)	MF Residential (acres)	Commercial (acres)	Total Area[1] (acres)	Regional Project Area Reduction[2] (acres)	Required Area Tributary to LID Streets (acres)
Bell	272	513	271	1,056	181	219
Bell Gardens	91	402	146	639	0	160
Commerce	212	83	288	583	191	98
Cudahy	51	434	59	544	85	115
Huntington Park	562	481	352	1,394	557	209
Maywood	430	121	109	660	209	113
Vernon	1	0	16	17	1	4
Totals:	**1,619**	**2,033**	**1,241**	**4,893**	**1,224**	**918**

SF = Single Family, MF = Mixed Family, LAR = Los Angeles River, LID = Low Impact Development
[1] Total area includes SF Residential, MF Residential, and Commercial areas.
[2] Area reductions are determined based on the total SF Residential, MF Residential, and Commercial land uses in proposed regional BMP tributary area.

4.3.3.3 Regional BMPs

Regional BMP opportunities were identified using the approach discussed in **Section 3.2.3**. Six regional infiltration BMPs (two infiltration trenches and four subsurface infiltration systems) were carried forward to the final RAA modeling iteration. The locations of these regional BMPs and their drainage areas are shown in **Figure 4-5**. The six regional projects include:

- Randolph Street Green Rail Trail;
- LADWP Transmission Easement;
- John Anson Ford Park;
- Rosewood Park;
- Lugo Park; and
- Salt Lake Park.

The Randolph Street Green Rail and LADWP Transmission Easement regional BMPs were sized using the maximum dimensions presently considered feasible due to size and design constraints. All other regional BMPs were iteratively sized to meet the TLRs. Regional BMP conceptual design attributes that were used for RAA modeling using SBPAT are summarized below.

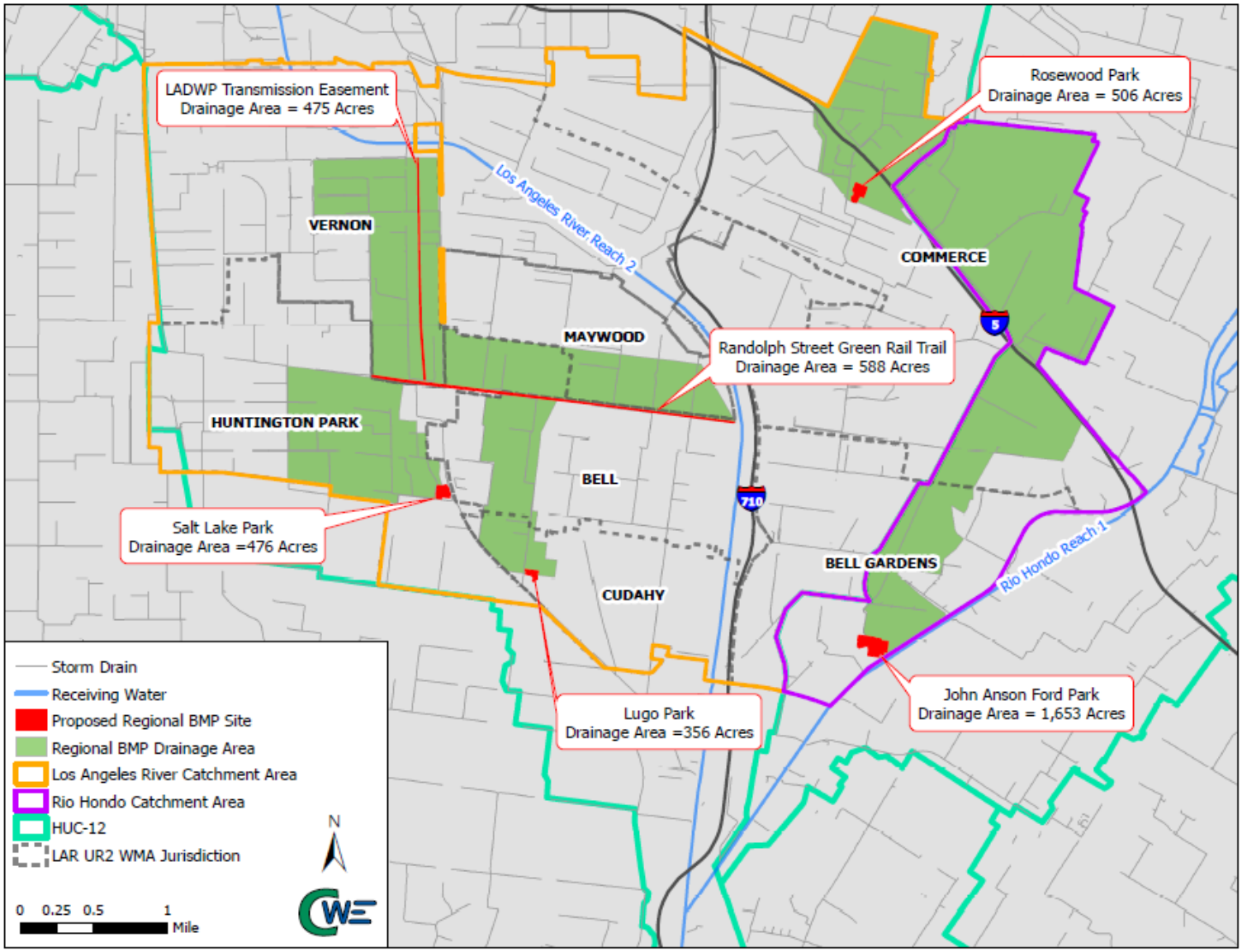


Figure 4-5 Proposed Regional Project Sites and Tributaries

Randolph Street Green Rail Trail

An infiltration trench project opportunity was identified adjacent to the Randolph Street Green Rail Trail. **Figure 4-6** illustrates the proposed project site and corresponding tributary drainage area. This BMP was modeled as an infiltration basin using the following design parameters and assumptions:

Table 4-11 John Anson Ford Park Design Parameters

Design Parameter	Value
Water Quality Design Volume	8.2 acre feet/354,000 cubic feet
Infiltration Rate	0.17 inches/hour
Design Storm Treated	0.19 inches
Regional BMP Length	10,400 feet
Regional BMP Width	10 feet
Regional BMP Depth	10 feet
Area Assumed for Pretreatment and Side Slopes	15%
Assumed Void Ratio	0.4

LADWP Transmission Easement

An infiltration trench project opportunity was identified along a Los Angeles City DWP transmission line. **Figure 4-7** illustrates the proposed project site and corresponding tributary drainage area. The water quality design volume of the planned infiltration trench was modeled as an infiltration basin in SBPAT using the following design parameters and assumptions:

Table 4-12 LADWP Transmission Easement Design Parameters

Design Parameter	Value
Water Quality Design Volume	15 acre feet/656,000 cubic feet
Infiltration Rate	0.17 inches/hour
Design Storm Treated	0.43 inches
Regional BMP Length	4,760 feet
Regional BMP Width	20 feet
Regional BMP Depth	10 feet
Area Assumed for Pretreatment and Side Slopes	15%
Assumed Void Ratio	0.9

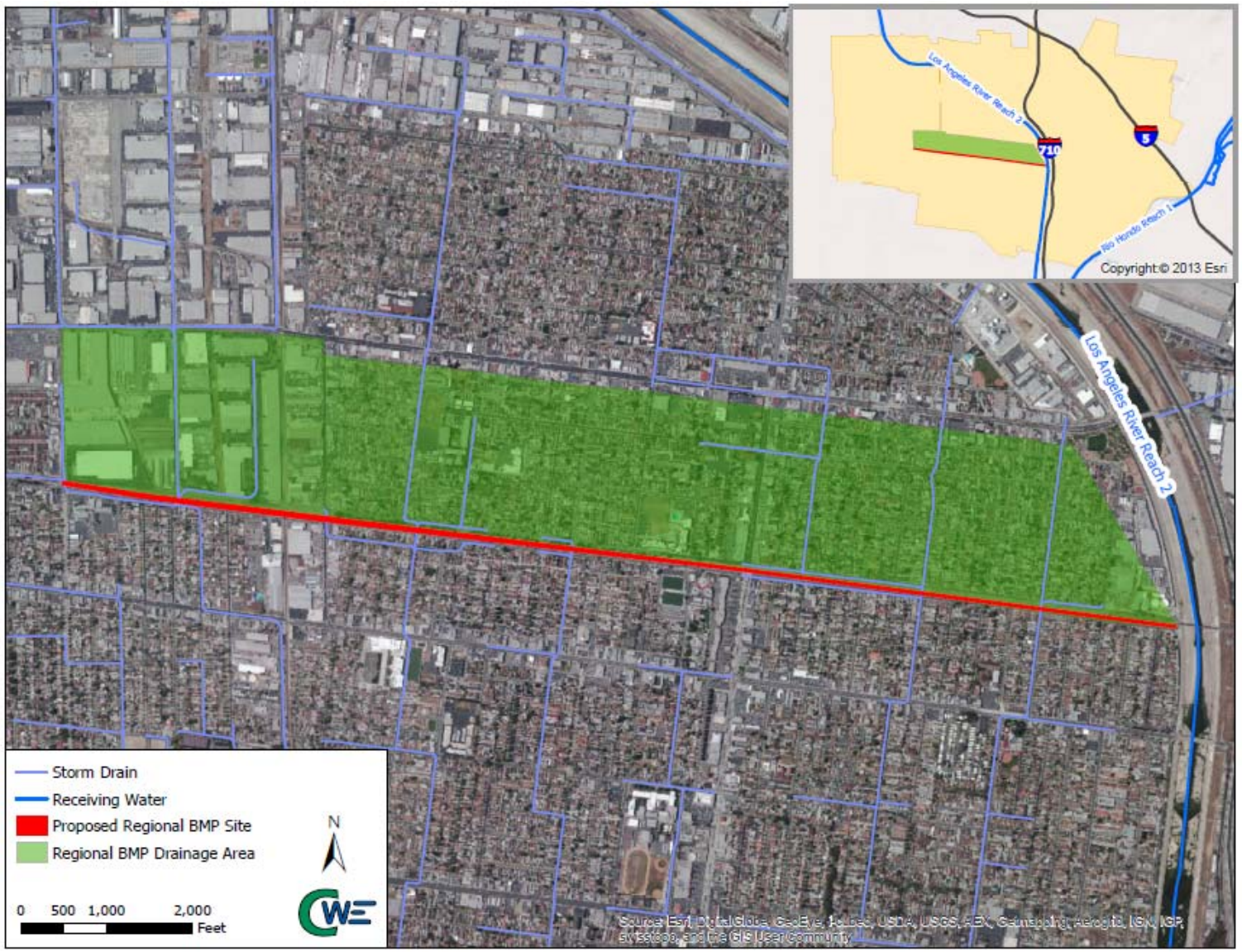


Figure 4-6 Randolph Street Green Rail Trail

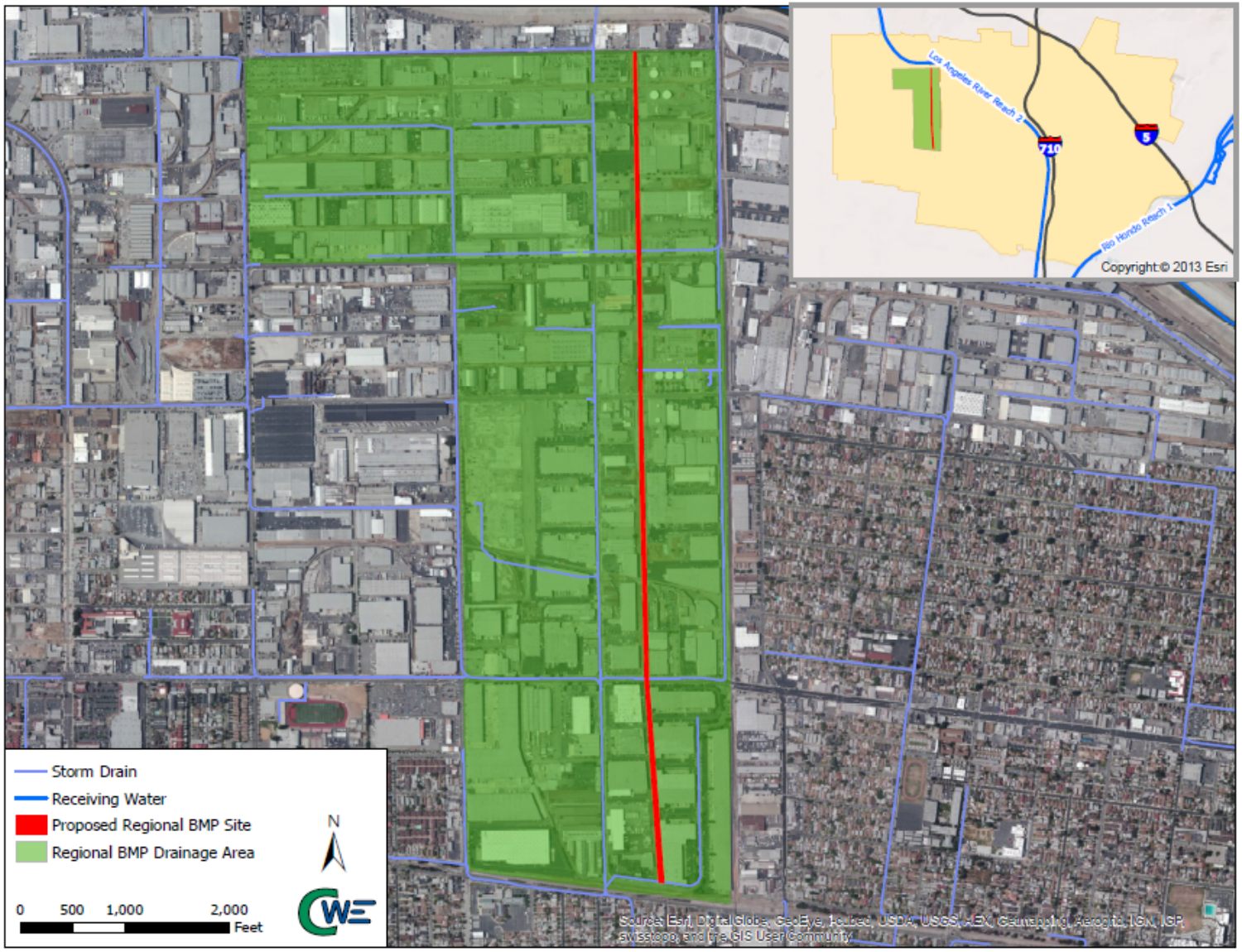


Figure 4-7 LADWP Transmission Easement

John Anson Ford Park

A subsurface infiltration project opportunity was identified at the ball fields of John Anson Ford Park. An illustration of the proposed regional BMP footprint is presented in **Figure 4-8**. The water quality design volume of this subsurface infiltration facility was modeled as an infiltration basin in SBPAT using the following design parameters and assumptions:

Table 4-13 John Anson Ford Park Design Parameters

Design Parameter	Value
Water Quality Design Volume	72 acre feet/3,124,000 cubic feet
Infiltration Rate	0.36 inches/hour
Design Strom Treated	0.6 inches
Footprint Area	544,500 square feet
Assumed Void Ratio	0.9

Rosewood Park

A subsurface infiltration project opportunity was identified at the baseball field in Rosewood Park. An illustration of the proposed regional BMP footprint is presented in **Figure 4-9**. The water quality design volume of this subsurface infiltration facility was modeled as an infiltration basin in SBPAT using the following design parameters and assumptions:

Table 4-14 Rosewood Park Design Parameters

Design Parameter	Value
Water Quality Design Volume	29 acre feet/1,250,000 cubic feet
Infiltration Rate	0.23 inches/hour
Design Storm Treated	0.77 inches
Footprint Area	217,800 square feet
Assumed Void Ratio	0.9

Lugo Park

A subsurface infiltration project opportunity was identified at the softball field and open space of Lugo Park. An illustration of the proposed regional BMP footprint is presented in **Figure 4-10**. The water quality design volume of this subsurface infiltration facility was modeled as an infiltration basin in SBPAT using the following design parameters and assumptions:

Table 4-15 Lugo Park Design Parameters

Design Parameter	Value
Water Quality Design Volume	13.2 acre feet/575,000 cubic feet
Infiltration Rate	0.17 inches/hour
Design Storm Treated	0.71 inches
Footprint Area	100,000 square feet
Assumed Void Ratio	0.9

Figure 4-8 John Anson Ford Park

Figure 4-9 Rosewood Park

Figure 4-10 Lugo Park

Salt Lake Park

A subsurface infiltration facility project opportunity was identified at the ball fields of Salt Lake Park. An illustration of the regional BMP footprint is presented in **Figure 4-11**. The water quality design volume of this subsurface infiltration facility was modeled as an infiltration basin in SBPAT using the following design parameters and assumptions:

Table 4-16 Salt Lake Park Design Parameters

Design Parameter	Value
Water Quality Design Volume	26 acre feet/1,125,000 cubic feet
Infiltration Rate	0.17 inches/hour
Design Storm Treated	0.75 inches
Footprint Area	196,000 square feet
Assumed Void Ratio	0.9

Figure 4-11 Salt Lake Park

4.4 Modeling Output

An iterative process was employed to identify suites of structural and non-structural BMPs capable of achieving the TLRs. Bacteria was found to be the driving (or limiting) pollutant for the Los Angeles River drainage area, and zinc was the driving pollutant for the Rio Hondo drainage area. The following tables present individual and summed BMP load reductions for fecal coliform, copper, and zinc for the Los Angeles River and Rio Hondo drainage areas. Bacteria load reduction results (**Table 4-17** and **Table 4-18**) are shown for the final wet-weather bacteria TMDL compliance date of 2037, modeled using rainfall data from the 90th percentile year based on wet days (2011). Metals load reduction results (**Table 4-19** and **Table 4-20**) are shown for the final wet-weather metals TMDL compliance date of 2028, modeled using rainfall data from the 90th percentile year based on rainfall (1995). Average (mean) load reduction results are shown, as well as the interquartile ranges (25th to 75th percentiles), to reflect model output variability, which is primarily driven by land use EMC variability. Total BMP load reductions that exceed the TLRs indicate that reasonable assurance (of meeting the MS4 Permit limits) has been demonstrated for that pollutant for that drainage area.

Table 4-17 Fecal Coliform Load Reductions for Los Angeles River Drainage Area

Control Measure	Average	Low (25th Percentile)	High (75th Percentile)
Non-Structural BMPs			
Non-MS4 NPDES Parcels	77	77	77
LID Ordinance	31	23	35
Other Non-Modeled	50	50	50
Regional BMPs			
Randolph Green Rail Trail	6	4	7
LADWP Transmission Easement	3	2	4
Rosewood Park	31	18	35
Lugo Park	13	8	15
Salt Lake Park	24	16	27
Distributed BMPs			
LID Streets	72	45	82
Target Load Reduction	**289**	**289**	**289**
Total BMP Load Reduction	**307**	**243**	**332**

Table 4-18 Fecal Coliform Load Reductions for Rio Hondo Drainage Area			
Control Measure	**Average**	**Low (25th %ile)**	**High (75th %ile)**
Non-Structural BMPs			
Non-MS4 NPDES Parcels	10	10	10
LID Ordinance	6	4	6
Other Non-Modeled	9	9	9
Regional BMPs			
John Anson Ford Park	47	31	53
Distributed BMPs			
LID Streets	NA	NA	NA
Target Load Reduction	**56**	**56**	**56**
Total BMP Load Reduction	**71**	**55**	**78**

Table 4-19 Copper and Zinc Load Reductions for Los Angeles River Drainage Area						
Control Measure	**Total Copper**			**Total Zinc**		
	Average	**Low 25th %ile**	**High 75th %ile**	**Average**	**Low 25th %ile**	**High 75th %ile**
Non-Structural BMPs						
Non-MS4 NPDES Parcels	274	274	274	2,580	2,580	2,580
LID Ordinance	29	26	32	320	277	343
Other Non-Modeled	34	34	34	339	339	339
Brake Pad (SB 346)	143	146	139	-	-	-
Regional BMPs						
Randolph Green Rail Trail	3	3	3	36	31	40
LADWP Transmission Easement	5	5	6	51	52	66
Rosewood Park	14	12	15	172	151	189
Lugo Park	3	3	3	27	24	29
Salt Lake Park	7	6	7	47	43	50
Distributed BMPs						
LID Streets	18	16	19	140	124	143
Target Load Reduction (with SSO considered)	**208 (0)**	**208 (0)**	**208 (0)**	**2,442**	**2,442**	**2,442**
Total BMP Load Reduction	**529**	**526**	**533**	**3,712**	**3,622**	**3,778**

Table 4-20 Copper and Zinc Load Reductions for Rio Hondo Drainage Area

Control Measure	Total Copper			Total Zinc		
	Average	Low 25th %ile	High 75th %ile	Average	Low 25th %ile	High 75th %ile
Non-Structural BMPs						
Non-MS4 NPDES Parcels	0.2	0.2	0.2	4	4	4
LID Ordinance	5	4	6	70	60	77
Other Non-Modeled	7	7	7	80	80	80
Brake Pad (SB 346)[1]	44	48	41	-	-	-
Regional BMPs						
John Anson Ford Park	46	39	52	659	566	731
Distributed BMPs						
LID Streets	NA	NA	NA	NA	NA	NA
Target Load Reduction (with SSO considered)	**59 (0)**	**59 (0)**	**59 (0)**	**781**	**781**	**781**
Total BMP Load Reduction	**103**	**99**	**106**	**813**	**709**	**893**

[1] For SB346, low load reductions are higher than average, and high load reductions are lower than average, because of the calculation methodology that is used. This methodology is described in Section 3.5, which states that the copper load reduction "was applied to the remaining copper load after all structural BMP load reductions were removed," and the remaining copper load is high for the low load reduction scenario (and low for the high load reduction scenario).

5. Compliance Schedule and Cost

Interim and final compliance dates in the LAR Metals and Bacteria TMDLs are the primary drivers for the LAR UR2 WMA RAA and WMP Plan implementation schedule. The dates identified in this WMP Plan are subject to the procurement of grants or other financing support commensurate with the existing and future fiduciary responsibilities of the Permittees. They may furthermore be adjusted based on evolving information developed through the iterative adaptive management process identified in the 2012 MS4 Permit or similar Parts within future MS4 Permits. As discussed in the CIMP, the LAR Bacteria TMDL LRS would be shifted two years back to match Rio Hondo schedule and allow a single WMA study.

5.1 WMP Implementation Schedule

Part VI.C.5.c of the MS4 Permit discusses the compliance schedule requirements associated with the WMP. The WMP Implementation schedule was developed based on TMDL milestones (i.e., interim and final numeric limits) identified in **Table 1-6**. The Los Angeles River Metals TMDL requires 50 percent of the final load reductions to be achieved by 2024, while the Los Angeles River Bacteria TMDL allows agencies to set a percent of final load reductions to be achieved by the 2030 interim milestone.

To allow comparison with the metals interim compliance target, and to allow the development of a bacteria interim compliance target, average load reductions were estimated to reflect the structural and non-structural BMP implementation schedule. **Table 5-1** identifies the proposed control measure implementation schedule based on what LAR UR2 WMA deems feasible and the phasing needed to achieve compliance with interim and final compliance targets for both bacteria and metals. The resulting average load reductions, phased by milestone date, are presented in the following figures. **Figure 5-1** through **Figure 5-3** address fecal coliform, copper, and zinc, respectively, for the Los Angeles River drainage area. **Figure 5-4** through **Figure 5-6** address fecal coliform, copper, and zinc, respectively, for the Rio Hondo drainage area. The WMP, including the schedule aspect, will be updated through the adaptive management process, therefore the schedule identified is always tentative.

Table 5-1 Tentative Control Measure Implementation Schedule

Control Measure	Tentative Date to be Implemented
Non-Structural BMPs	
Non-MS4 NPDES Parcels	December 2017
LID Ordinance	March 2037[1]
Other Non-Modeled	January 2028
Brake Pad (SB 346)	January 2028
Regional BMPs	
John Anson Ford Park	January 2024
Randolph Green Rail Trail	January 2028
LADWP Transmission Easement	January 2028
Rosewood Park	January 2030
Lugo Park	March 2037
Salt Lake Park	March 2037
Distributed BMPs	
LID Streets (Los Angeles River side only)	March 2037[2]

[1] Interim milestone dates assume a percentage of final load reduction
[2] Assume 50 percent implementation by March 2030

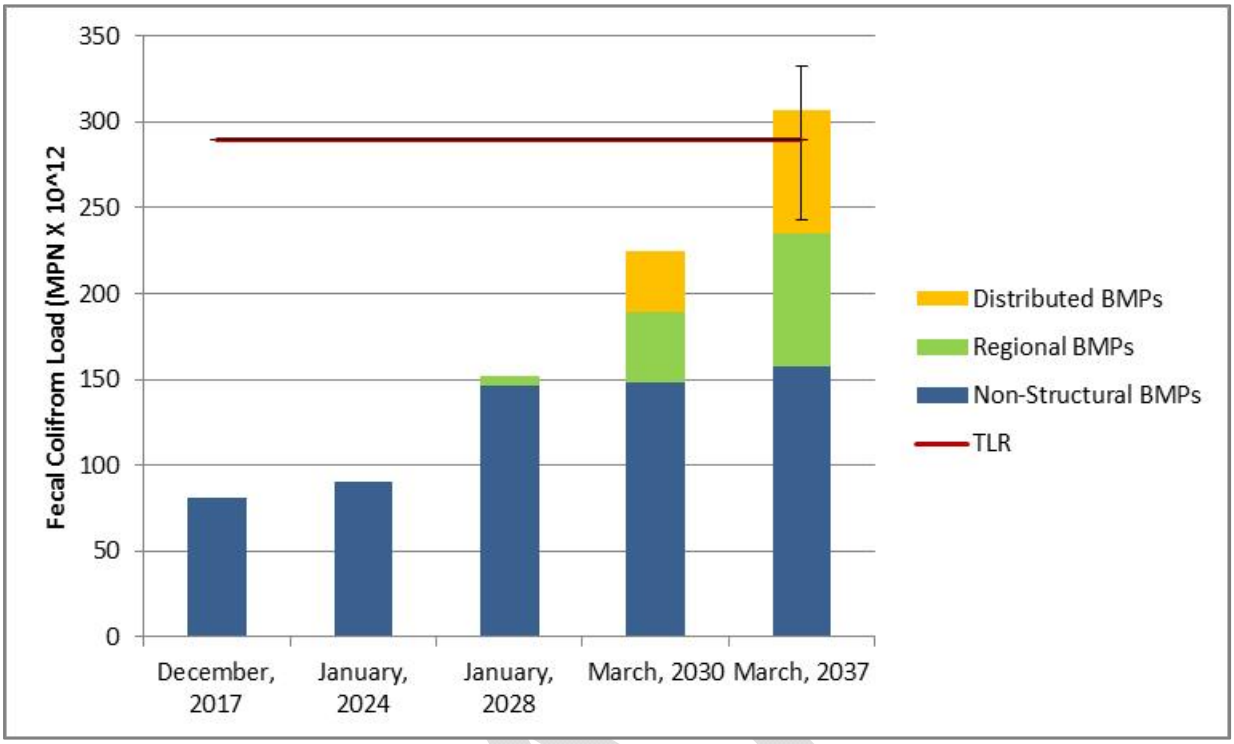


Figure 5-1 Fecal Coliform Load Reduction Milestones for the LAR UR2 WMA by BMP Category

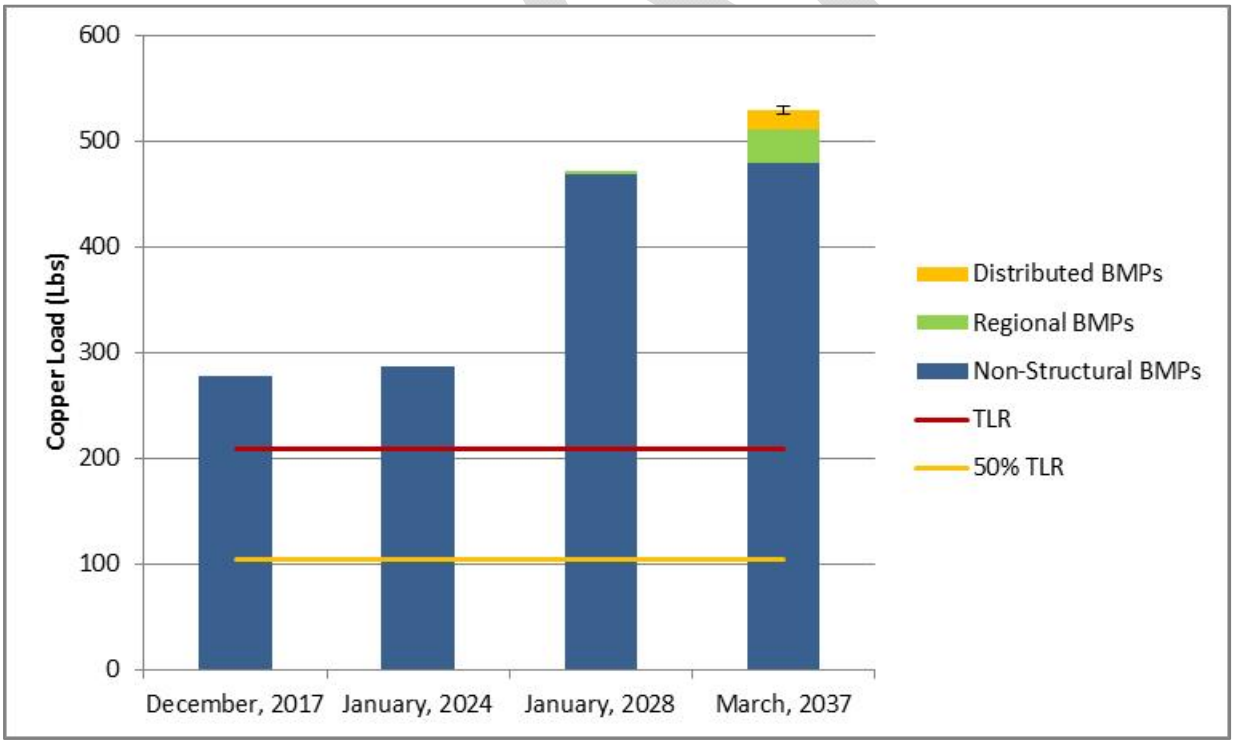


Figure 5-2 Copper Load Reduction Milestones for the LAR UR2 WMA by BMP Category

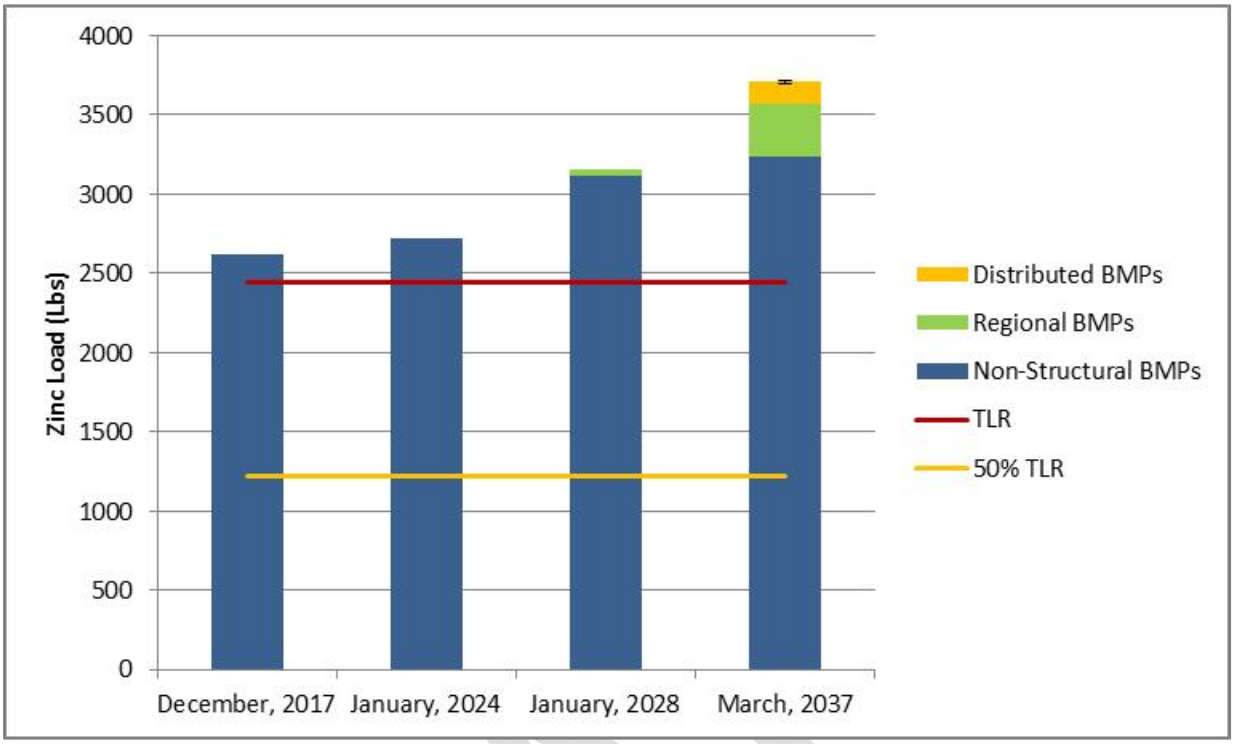


Figure 5-3 Zinc Load Reduction Milestones for the LAR UR2 WMA by BMP Category

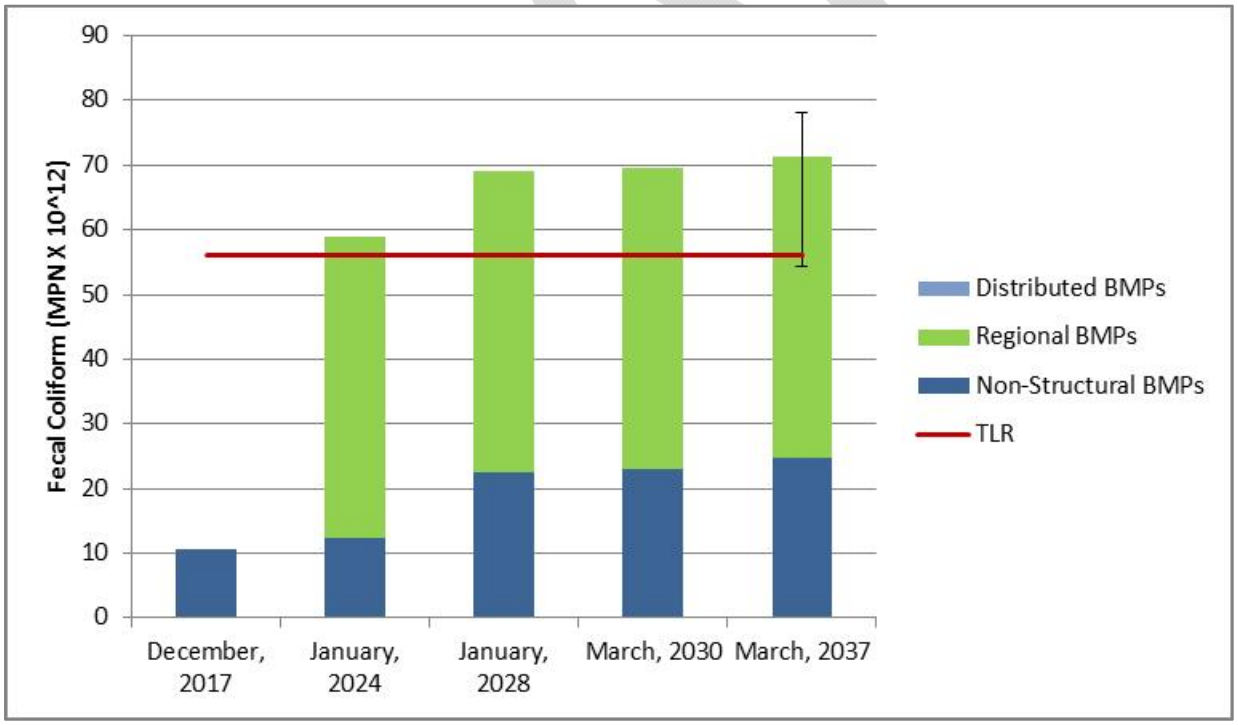


Figure 5-4 Fecal Coliform Load Reduction Milestones for the LAR UR2 Rio Hondo WMA by BMP Type

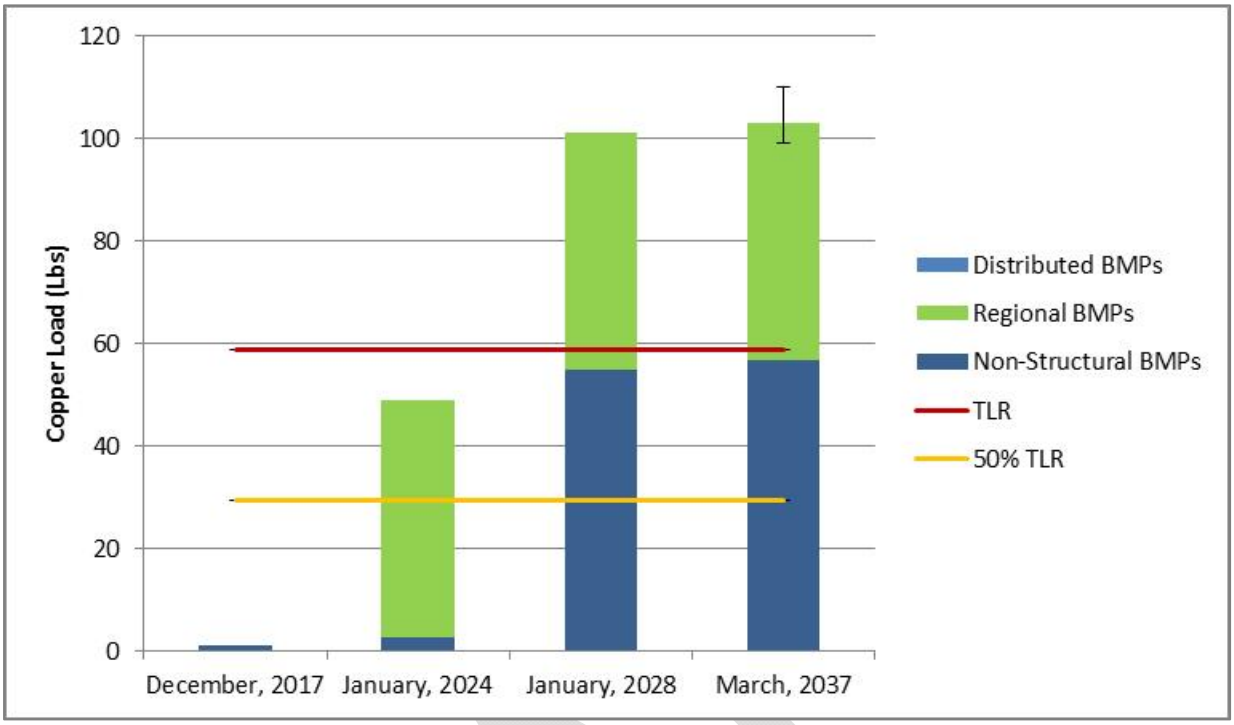


Figure 5-5 Copper Load Reduction Milestones for the LAR UR2 Rio Hondo WMA by BMP Category

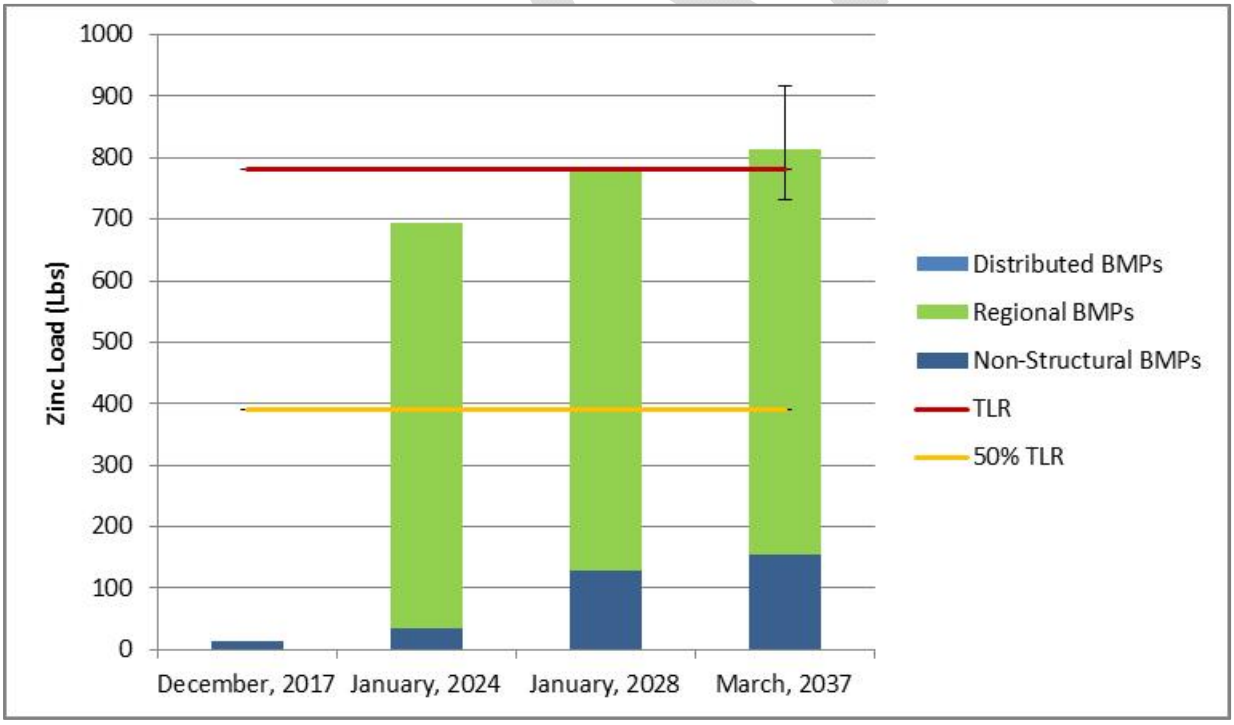


Figure 5-6 Zinc Load Reduction Milestones for the LAR UR2 Rio Hondo WMA by BMP Category

5.2 WMP Implementation Cost

In order to determine potential funding strategies, costs associated with the implementation of the control measures identified in this WMP must be considered. This section identifies the cost associated with the structural BMPs (regional and distributed) and non-structural BMPs. A Memorandum of Understanding (MOU) between LAR UR2 WMA jurisdictions determined that LACFCD would pay ten percent of the WMP development costs and each City would pay an equal one seventh share of forty-five percent of the WMP development costs. In addition, each City paid its pro-rata share of forty-five percent of the WMP developments cost at the cost sharing allocation percentage provided in **Table 5-2**.

Table 5-2 Cost Sharing Allocation of Forty-Five Percent of WMP Cost

LAR UR2 WMA Jurisdiction	Land Area (mi^2)	Cost Allocation Percentage
Bell	2.64	11.90
Bell Gardens	2.49	11.22
Commerce	6.57	29.61
Cudahy	1.12	5.05
Huntington Park	3.03	13.65
Maywood	1.18	5.32
Vernon	5.16	23.25

The cost of the regional BMPs will be shared based on future MOU(s), while the distributed BMPs (LID Streets or Green Streets) will be paid for by the jurisdiction for which they are implemented.

Planning-level cost estimates are presented for each of the six preliminary regional BMP projects and the distributed BMPs (LID Streets) for LAR UR2 WMA. During the preliminary concept phase it may be difficult to produce a precise cost estimate because the specific details pertaining to the projects have not been determined therefore the costs are presented as a range. The cost estimate employs best engineering judgment and was determined based on a per acre-feet unit rate, or for the LID Streets, a cost per acre of tributary area. The cost estimates consider the costs associated with planning, design, permits, an environmental assessment, construction, operation and maintenance, construction administration and inspections, post-construction effectiveness monitoring, contingency, and mobilization. Land acquisition costs may be of importance depending on the site, and are not considered in the cost estimates presented, as none of the preliminary project concepts require land acquisition. The following generally accepted costs were used for cost estimates presented:

- Planning - minimum between 5 percent of construction cost or $100,000
- Engineering design - 10 percent of construction cost
- Permits and specifications - 25 percent of engineering design cost
- Construction administration and inspections - 10 percent of construction (including mobilization)
- Contingency - 10 percent of construction (including mobilization)
- Mobilization - 10 percent of construction

The costs estimates associated with the six regional BMP projects will be adjusted as more information becomes available and as additional project concept details are developed. Based on the current estimates, the cost of implementing all six projects is approximately $209 million. Applying the cost allocations contained in the WMP development MOU, **Table 5-3** summarizes the cost each LAR UR2 WMA jurisdiction will contribute under current assumptions and **Table 5-4** summarizes the cost and major characteristics of each of the proposed regional BMPs.

Table 5-3 Cost Allocation for Proposed Regional BMP Projects	
LAR UR2 WMA Jurisdiction	**Cost**
Bell	$24,600,000
Bell Gardens	$24,000,000
Commerce	$41,200,000
Cudahy	$18,200,000
Huntington Park	$26,300,000
Maywood	$18,500,000
Vernon	$35,300,000
Other Agencies	$20,900,000
Total:	**$209,000,000**

Table 5-4 LAR UR2 WMA Regional BMP Cost Estimate	
Name	**Cost**
Randolph Street Green Rail Trail	$10,800,000
LADWP Transmission Easement	$19,600,000
John Anson Ford Park	$91,300,000
Rosewood Park	$36,800,000
Lugo Park	$17,200,000
Salt Lake Park	$33,200,000
Total:	**$209,000,000**

Note: Estimates are based on 2014 dollars.

Based on the LID Street assumptions outlined in **Section 4.3.3.2**, the area of commercial and residential land uses that must be tributary to a LID Street were determined for each LAR UR2 WMA jurisdiction draining to the Los Angeles River. A cost was determined for each jurisdiction, taking into account the area tributary to a proposed regional BMP. **Table 5-5** summarizes the costs anticipated due to LID Streets.

Table 5-5 LID Streets Cost Estimate

LAR UR2 WMA Jurisdiction	SF Residential (acres)	MF Residential (acres)	Commercial (acres)	Total Area[1] (acres)	Area Reduction[2] (acres)	25% of Remaining Area (acres)	Total Cost
Bell	272	513	271	1,056	181	219	$21,900,000
Bell Gardens (LAR Side)	91	402	146	639	0	160	$16,000,000
Commerce (LAR Side)	212	83	288	583	191	98	$9,800,000
Cudahy	51	434	59	544	85	115	$11,500,000
Huntington Park	562	481	352	1,394	557	209	$20,900,000
Maywood	430	121	109	660	209	113	$11,300,000
Vernon	1	0	16	17	1	4	$400,000
Totals:	**1,619**	**2,033**	**1,241**	**4,893**	**1,224**	**918**	**$91,800,000**

SF = Single Family, MF = Mixed Family, LAR = Los Angeles River, LID = Low Impact Development

[1] Total area includes SF Residential, MF Residential, and Commercial areas.

[2] Area reductions based on the total of SF Residential, MF Residential, and Commercial land uses areas within proposed regional BMP tributary areas.

5.3 WMP Funding

In order to implement the control measures identified within the LAR UR2 WMA WMP, or future WMP iterations developed through the iterative AMP, funding from a variety of sources, including the possibility of partnering with other agencies, will need to be developed and managed in such a way as so ensure that the programs and projects are implemented on schedule. According to an article titled "Financial Strategies for Stormwater Management" (Treadway, 2000), stormwater programs are generally funded with both primary and secondary funding methods.

Primary methods generally have adequate capacity and flexibility to fund the bulk of the stormwater program and can be lumped into two categories:

- General fund revenues - property tax, franchise fees, local income tax, and/or general sales tax
- Stormwater user fees - also known as stormwater utility fees

Secondary funding methods are used to enhance equity or simplicity. These funds are generally generated by various fees (e.g. impact fees or plan review fees), debt financing, grants or government cost share programs, special assessments, improvement districts, connection charges, in liu of fees, etc. Each of these secondary methods has conditions and limitations that restrict their use to specially targeted parts of the stormwater program (Treadway, 2000).

Table 5-6 outlines the current stormwater program funding for LAR UR2 WMA. LAR UR2 WMA will evaluate the various funding options in order to determine what works best. The funding mechanisms may vary by jurisdiction and by project. **Table 5-7** identifies potential funding strategies based on implementation actions which will be further evaluated. In addition, a summary of the identified grant and loan opportunities that will be further evaluated can be found in **Appendix I**.

The Gateway Cities Transportation Water Quality Strategic Plan, released in March 25, 2014 identifies over one hundred local and Transportation Corridor related BMP projects that could be constructed within the Gateway Cities region. Many of these projects are along the I-5 and I-710 Freeway corridors and would primarily benefit Caltrans by reducing the discharges of pollutants from that Permittee. A few are located within the LAR UR2 WMA. John Anson Ford Park and Salt Lake Park are also identified in this LAR UR2 WMA WMP. Others, such as Veterans and Little Bear Park in Bell, Bell Gardens Park in Bell Gardens, and Veteran's Memorial Park in Commerce, were considered during preparation of this study, but appeared to provide little benefit, often because of the lack of a nearby drainage system, legacy contamination issues, permitting difficulties or small tributary catchment. The report referenced the Federal USEPA and State Department of Water Resources as potential funding sources for its projects.

In a study entitled ***Stormwater Funding Options*** prepared for The League of California Cities, Los Angeles County Division and California Contract Cities Association, and dated May 29, 2014, the proponents acknowledge the enormity of the tasks that lie ahead for the LAR UR2 WMA and all Los Angeles County MS4 Permittees. They propose a multi pronged range of existing and proposed funding mechanisms and encourage each agency to develop an appropriate mix to support its needs and expectations. Without substantial additional and adequate financial support to the LAR UR2 WMA, it will not be possible to implement the WMP or MS4 Permit to the extent intended by the Permittees.

Table 5-6 Recent Stormwater Program Costs and Budgets

Stormwater Program	Bell	Bell Gardens	Commerce	Cudahy	Huntington Park	Maywood	Vernon	Total
2011-2012 Program Costs[1]								
Public Information and Participation Program	$1,836	$0	$20,000	$2,500	$7,950	$2,950	$9,376	**$44,612**
Industrial/Commercial Facilities Program	$2,204	$53,300	$205,000	$3,000	$75,000	$3,600	$13,520	**$355,624**
Planning and Land Development Program	$2,160	$5,250	$50,000	$4,000	N/A	$0	$4,925	**$66,335**
Development and Construction Program	$692	$7,875	$12,000	$5,000	N/A	$0	$8,259	**$33,826**
Public Agency Activities Program	$453,576	$1,911,906	$1,495,500	$6,300	$725,000	$49,506	$615,417	**$5,257,205**
IC/ID Elimination Program	$1,620	$10,500	$5,100	$4,000	N/A	$0	$7,745	**$28,965**
Total	**$462,088**	**$1,988,831**	**$1,787,600**	**$24,800**	**$807,950**	**$56,056**	**$659,242**	**$5,786,567**
2012-2013 Program Budget[1]								
Public Information and Participation Program	$1,700	$2,250	$100,000	$3,000	$7,950	$15,500	$30,000	**$160,400**
Industrial/Commercial Facilities Program	$3,500	$50,000	$205,000	$5,000	$75,000	$10,000	$40,000	**$388,500**
Planning and Land Development Program	$3,000	$5,250	$75,000	$4,000	N/A	$2,000	$23,000	**$112,250**
Development and Construction Program	$1,500	$7,875	$25,000	$5,000	N/A	$3,000	$16,000	**$58,375**
Public Agency Activities Program	$452,000	$2,196,000	$1,935,000	$40,000	$700,000	$67,550	$1,077,000	**$6,467,550**
IC/ID Elimination Program	$1,800	$10,500	$5,100	$4,000	N/A	$0	$70,000	**$91,400**
Total	**$463,500**	**$2,271,875**	**$2,345,100**	**$61,000**	**$782,950**	**$98,050**	**$1,256,000**	**$7,278,475**

[1] Based on 2012 Annual Reports, except the 2011 Annual Reports were used for the Cities of Cudahy and Huntington Park.

Table 5-7 Funding Opportunities by WMP Implementation Effort

Funding Opportunity	Stormwater Program						Regional BMP Projects						Distributed BMP Projects
	Public Information and Participation Program	Industrial/Commercial Facilities Program	Planning and Land Development Program	Development Construction Program	Public Agency Activities Program	IC/ID Elimination Program	Randolph Street Green Rail Trail	LADPW Easement	John Anson Ford Park/Golf Course	Rosewood Park	Lugo Park	Salt Lake Park	LID or Green Streets
General Funds	X	X	X	X	X	X							
Additional taxes	X	X	X	X	X	X	X	X	X	X	X	X	X
Stormwater Utility Fee	X	X	X	X	X	X	X	X	X	X	X	X	X
General Fees	X	X	X	X	X	X							X
Grant Opportunities													
Proposition 84 Stormwater Program							X	X	X	X	X	X	X
Community Action for a Renewed Environment (CARE)	X	X	X	X	X	X	P		P	P	P	P	
Pollution Prevention (P2)	X	X	X	X	X	X	P		P	P	P	P	
Urban Waters Small Grant	X	X	X	X	X	X	P		P	P	P	P	
Environmental Education Grant and SubGrant	X	X	X	X	X	X	P		P	P	P	P	
Cooperative Watershed Management Plan	X	X	X	X	X	X	X	X	X	X	X	X	X
State of California Coastal Conservancy Program	P						X	X	X	X	X	X	
Wildlife Conservation Board (WCB)													

Table 5-7 Funding Opportunities by WMP Implementation Effort

Funding Opportunity	Stormwater Program						Regional BMP Projects						Distributed BMP Projects
	Public Information and Participation Program	Industrial/Commercial Facilities Program	Planning and Land Development Program	Development Construction Program	Public Agency Activities Program	IC/ID Elimination Program	Randolph Street Green Rail Trail	LADPW Easement	John Anson Ford Park/Golf Course	Rosewood Park	Lugo Park	Salt Lake Park	LID or Green Streets
Habitat Conservation Fund (HCF)													
Land and Water Conservation Fund (LWCF)													
Recreational Trails Program (RTP)							X						
TIGER Discretionary Grant							X						
Environmental Solutions for Communities	P						X	X	X	X	X	X	
Clean Water Act (CWA) §319(h) Non-Point Source													P
Potential 2014 Water Bond	P	P	P	P	P	P	P	P	P	P	P	P	
Loan Opportunities													
Clean Water State Revolving Fund (CWSRF)							X	X	X	X	X	X	
Financial Incentives for Recycled Water Projects to Provide Drought Relief							X	X	X	X	X	X	
Infrastructure State Revolving Fund (ISRF)							X	X	X	X	X	X	X

X = Eligible for opportunity (with conditions); P = Potentially eligible for opportunity

6. Legal Authority

Permit Part VI.C.5.b.iv.(6) directs that the *Permittee shall provide documentation that they have the necessary legal authority to implement the Watershed Control Measures identified in the plan, or that other legal authority exists to compel implementation of the Watershed Control Measures.* This authority appears to be more narrow than the broad legal authority addressed within Permit Part VI.A.2, which has been an annual report requirement since early in the implementation of the 2001 MS4 Permit. The majority of the Watershed Control Measures identified in the LAR UR2 WMA WMP Plan are associated with regional structural BMPs and LID streets that have been preliminarily sited on municipal public lands including parks, street right of ways. The primary exception to this practice of using municipal public lands is the Los Angeles Department of Water and Power (LADWP) Transmission Line Easement through the City of Vernon. However, as visible in aerial photographs, this easement has allowed many encroachments compatible with its primary purpose and the concept proposal includes alternatives to maintain the primary purpose of the easement. With a project implementation date over a decade in the future, we believe the design and permitting hurdle can be surpassed or the RAA and WMP modified through the adaptive management process. Permittees, or other entities, regulated under state or federal law (e.g. Railroads and other NPDES Permittees) and found to have problematic discharges, may be identified through the adaptive management process or during implementation of the CIMP and WMP plans. If these entities are found to require authorities beyond those of the Permittees, or are otherwise recalcitrant to instituting comparable Watershed Control Measures, they may be referred to other legal authorities enabled to compel implementation.

7. References

Bambic, D. G. 2008. The Los Angeles River Bacteria Source Identification Study.

Bannerman, R., D. Owen, R. Dodds, and N. Hornewer. 1993. Sources of Pollutants in Wisconsin Stormwater. Water Science and Technology. 28(3-5): 241-259.

Berg, J.M., S.C. Hedges, and S.D. Jakubowski. 2009. Evaluating Irrigation Effectiveness. http://www.waterefficiency.net/WE/Articles/Evaluating_Irrigation_Effectiveness_7397.aspx

California Regional Water Quality Control Board (RWQCB), San Diego Region. 2007. Waste discharge requirements for discharges of urban runoff from the municipal separate storm sewer systems (MS4s) draining the watersheds of the County of San Diego, the incorporated Cities of San Diego County, the San Diego Unified Port District, and the San Diego County Regional Airport Authority. ORDER NO. R9-2007-0001.

California Stormwater Quality Association (CASQA). January 2007. Best Management Practice Handbooks. New Development and Redevelopment, Construction, Municipal, and Industrial/Commercial.

California Department of Transportation (Caltrans). May 2003. Statewide Storm Water Management Plan - (SWMP).

California Department of Transportation (Caltrans). July 2005. Storm Water Quality Handbooks, Storm Water Planning and Design Guide.

California Department of Transportation (Caltrans). April 2007. Treatment BMP Technology Report.

Center for Watershed Protection (CWP). 1996. Characterization of Heavy Metals in the Santa Clara Valley. Technical Note #71. Watershed Protection Techniques 2(2): 348-351.

Center for Watershed Protection (CWP). 2006. Technical Memorandum 1 – Literature Review. Research in support of an interim pollutant removal rate for street sweeping and stormdrain cleanout activities. Funded by USEPA Grant CG-97322201-0.

City of Austin. 2008. Scoop the Poop Education Campaign, Summary Report.

City of San Diego. 2011a. Phase II Pet Waste Bag Dispenser Station Design and Implementation Report. Final Report. Doc ID# CSD-RT-11-URS31-02.

City of San Diego. May 2011b. Targeted Aggressive Street Sweeping Pilot Program Phase IV Speed Efficiency Study.

City of San Francisco. 2010. San Francisco Stormwater Design Guidelines. Appendix A: BMP Factsheets. http://www.sfwater.org/modules/showdocument.aspx?documentid=2778.

City of Tacoma. 2008. Summary, Measurement, and Assessment of Education and Outreach Programs – Attachment B16.

Clean Water Education Program (CWEP). 2008. Pre- and Post-TV Campaign Surveys of Stormwater Awareness & Behavior in the CWEP Service Area: Comparisons and Findings, North Carolina.

Cleaner Rivers through Effective Stakeholder-led TMDLs (CREST). November 2008. Los Angeles River Bacteria Source Identification Study: Final Report.

County of Santa Cruz. 2006. Assessment of Sources of Bacteria Contamination at Santa Cruz County Beaches.

Donigian, A.S., B. R. Bicknell and E. Wolfram. 2009. Modeling the Contribution of Copper from Brake Wear Debris to the San Francisco Bay. Phase 2. Prepared by AQUA TERRA Consultants for the Brake Pad Partnership.

Easy Voter Guide. State Ballot Measures. Fast Facts. http://www.easyvoterguide.org/wp-content/pdf/FastFacts-BallotMeasures.pdf

Farfsing, K. and R. Watson. 2014. Stormwater Funding Options: Providing Sustainable Water Quality Funding in Los Angeles County. Prepared for California Contract Cities Association and The League of California Cities, Los Angeles County Division.

Geosyntec Consultants. 2010a. Dry Weather Source Characterization and Control Summary, Santa Monica Bay Beaches Bacteria TMDL Implementation.

Geosyntec Consultants. 2010b. Harbor Beaches of Ventura County (Kiddie Beach and Hobie Beach) Wet- Weather Bacteria Total Maximum Daily Load Implementation Plan for Unincorporated Ventura County.

Geosyntec Consultants. 2012. San Diego River Watershed Comprehensive Load Reduction Plan. Prepared for County of San Diego, City of San Diego, City of La Mesa, City of El Cajon, City of Santee, and Caltrans

German, J. and G. Svensson. 2002. Metal Content and Particle Size Distribution of Street Sediments and Street Sweeping Waste. Water Science and Technology, 46(6-7):191-198.

Griffith, J.F., Boehm, A.B., Holden, P., Jay, J.A., Weisberg, S.B. 2013. The California Microbial Source Identification Manual: A Tiered Approach to Identifying Fecal Pollution Sources to Beaches. Southern California Coastal Water Research Project.

Herrera Environmental Consultants. 2006. Technical Memorandum: Non-Structural Stormwater BMP Assessment. Prepared for the City of Portland Bureau of Environmental Services.

Kennedy, P. and S. Sutherland. 2008. Urban Sources of Copper, Lead and Zinc. Auckland Regional Council. Auckland, New Zealand. Auckland Regional Council Technical Report 2008/023.

LWA (Larry Walker Associates). 2013. Final Report Copper Water-Effect Ratio Study to Support Implementation of the Los Angeles River and Tributaries Metals TMDL.

Los Angeles County. Feb. 2012. Acute Communicable Disease Control Manual (B-73). *Toxoplasmosis*. http://www.publichealth.lacounty.gov/acd/procs/b73/DiseaseChapters/B73Toxoplasmosis.pdf.

Los Angeles County Department of Public Works (LACDPW). August 2005. Los Angeles County BMP Effectiveness Study. Los Angeles County Department of Public Works, Water Resources Division.

Los Angeles County Department of Public Works (LACDPW). January 2006. Los Angeles County Department of Public Works: Hydrology Manual. Los Angeles County Department of Public Works, Water Resources Division.

Los Angeles County Department of Public Works (LACDPW). August 2010. Stormwater Best Management Practice Design and Maintenance Manual. Los Angeles County Department of Public Works, Water Resources Division.

Los Angeles County Department of Public Works (LACDPW). 2002 – 2012. Annual Stormwater Monitoring Report. 2002 – 2012.

Los Angeles County Department of Public Works (LACDPW). August 2005. Los Angeles County BMP Effectiveness Study. Los Angeles County Department of Public Works, Water Resources Division.

Los Angeles County Department of Public Works (LACDPW). WMMS: Watershed Management Modeling System. http://dpw.lacounty.gov/wmd/wmms/.

Los Angeles County GIS Data Portal. 2013. http://egis3.lacounty.gov/dataportal.

Los Angeles Regional Water Quality Control Board (LARWQCB). April 2013. Water Quality Control Plan: Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, Section 3.

Los Angeles Regional Water Quality Control Board. 2013. Full Capture Certification for Trash TMDLs. http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/full_capture_certification.shtml.

Los Angeles River Reach 2 Participating Jurisdictions. October 2010. Los Angeles River and Tributaries Total Maximum Daily Load for Metals Final Implementation Plan for Reach 2 Participating Jurisdictions. Prepared by CDM Smith.

Los Angeles River Upper Reach 2 Watershed Management Area. June 2013. Notice of Intent for a Watershed Management Program for the Los Angeles River Upper Reach 2 Gateway Sub Watershed.

Minton, G.R., B. Lief, and R. Sutherland. November 1998. High efficiency sweeping or Clean a Street, Save a Salmon! Stormwater Treatment Northwest. 4(4).

Moran, K. 2013. Estimate of Urban Runoff Copper Reduction in Los Angeles County from Brake Pad Copper Reductions Mandated by SB 346. TDC Environmental.

Moran, K. 2013. Zinc Sources in California Urban Runoff. California Stormwater Quality Association.

Murray, J., P. Holden, B. Sercu, and L. Van De Werfhorst. 2011. Protocol for Source Tracking Sewage Contamination in Coastal California Urban Drains and Creeks. Presentation at StormCon.

North Carolina Cooperative Extension Service College of Agriculture and Life Sciences North Carolina University. 2006. Urban Integrated Pest Management (IPM). Chapter V: Protecting Water Quality. *Protecting Water Quality: Surface Waters*. http://ipm.ncsu.edu/urban/cropsci/toc.html.

NPDES Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating from the City of Long Beach. 2012. State Water Resources Control Board; Los Angeles Region. NPDES Permit No. CAS004001; Order No. R4-2012-0175.

Pitt, R. 2002. Emerging stormwater controls for critical source areas. Management of Wet-Weather Flow in the Watershed. Sullivan, D. & Field R. (Eds). p. 14-16. CRC Press, Boca Raton, FL.

Pitt, R. 1979. Demonstration of Nonpoint Pollution Abatement through Improved Street Cleaning Practices, EPA Report EPA-600/2-79-161.

Pitt, R. and P. Bissonette. 1985. Characterizing and Controlling Urban Runoff through Street and Sewerage Cleaning. Bellevue Urban Runoff Program. USEPA. Washington, D.C. EPA/600/ S2-85/038.

Pitt, R., D. Williamson, J. Voorhees, and S. Clark. 2004. Review of Historical Street Dust and Dirt Accumulation and Washoff Data. Effective Modeling of Urban Water Systems. W. James, K.N. Irvine, E.A McBean, and R.E. Pitt, (Eds.). ISBN 0-9736716-0-2. Chicago, IL.

RBF. 2014. Gateway Cities Transportation Water Quality Strategic Plan. Prepared for the Gateway Cities Council of Governments and the Los Angeles County Metropolitan Transportation Authority.

RMC Water and Environmental. 2014. Opti, Database in response to the Greater Los Angeles County IRWMP. http://irwm.rmcwater.com/la/login.php.

Rosselot, K. 2007. Copper and Solids Removed via Street Sweeping. Brake Pad Partnership.

Rosselot, K. 2006. Copper Released from Brake Pad Lining Wear in the San Francisco Bay Area. Brake Pad Partnership.

Ruby, A. 2011. Source Prioritization Process for Bacteria, Draft. County of San Diego.

Santa Barbara County Environmental Health Services Division. October 1999. Lower Rincon Creek Watershed Study: A Field Investigation into the Sources of Fecal Contamination in the Lower Rincon Creek Watershed and Ocean Interface (Surfzone).

SBPAT Stormwater Quality Planning. 2013a. About Structural BMP Prioritization Analysis Tool (SBPAT). Copyright Geosyntec.

SBPAT Stormwater Quality Planning. 2013b. Example of Structural BMP Prioritization and Analysis Tool (SBPAT). Example TMDL implementation plans and load reduction plans using SBPAT. Copyright Geosyntec.

Science Daily. May 2002. People Linked to Sea Otter Diseases. Society for Conservation Biology. http://www.sciencedaily.com/releases/2002/05/020529072149.htm.

Schilling, J.G. 2005. Street Sweeping – Report No. 1, State of the Practice. Prepared for Ramsey-Washington Metro Watershed District. North St. Paul, Minnesota.

Schueler, T.R. 2000. Microbes and Urban Watersheds: Concentrations, Sources, and Pathways. The Practice of Watershed Protection. Eds, T. Schueler and H. Holland. Center for Watershed Protection. Ellicott City, MD.

Schwarze Industries. 2004. Virginia test further documents pickup of high efficiency sweepers. American Sweeper. 8(1).

Selbig, W.R. and R.T. Bannerman. 2007. Evaluation of Street Sweeping as a Stormwater Quality Management Tool in Three Residential Basins in Madison, Wisconsin. U.S. Geological Survey Scientific Investigations Report 2007-5156.

State Water Resources Control Board (SWRCB). March 19, 2014. Media Release *State Water Board Approves $800 Million in Financial Incentives for Recycled Water Projects to Provide Drought Relief*. http://www.waterboards.ca.gov/press_room/press_releases/2014/pr031914.pdf.

Steets, Brandon, Lewis W., and Greene, G. March 17, 2014. Technical Memorandum #11: Task 3.3 - Approach for Identifying, Evaluating, and Prioritizing Regional BMP Projects - Draft.

Storm Water Solutions. 2013. Water Remediation Media. http://www.estormwater.com/water-remediation-media.

Susilo, K., B. Streets, M. Leisenring, and E. Strecker. 2006. Los Angeles County-wide Structural BMP Prioritization Methodology. County of Los Angeles - Department of Public Works, Heal the Bay, City of Los Angeles - Bureau of Sanitation.

Sutherland, R.C. 2011. Street Sweeping 101: Using Street Sweepers to Improve Water and Air quality. Stormwater Magazine. Jan/Feb.

United States Environmental Protection Agency (USEPA). 1983. Final Report of the Nationwide Urban Runoff Program. Office of Water. EPA Publication No. 840-B-92-002.

United States Environmental Protection Agency (USEPA). 1993. Guidance Specifying Management Measures for Source of Nonpoint Pollution in Coastal Waters. Office of Water.

United States Environmental Protection Agency (USEPA). 1999. Storm Water Technology Fact Sheet: Hydrodynamic Separators. http://water.epa.gov/scitech/wastetech/upload/2002_06_28_mtb_hydro.pdf.

United States Environmental Protection Agency (USEPA). December 2005. Stormwater Phase II Final Rule - Fact Sheet 2.3.

United States Environmental Protection Agency (USEPA). December 2005. Stormwater Phase II Final Rule - Fact Sheet 2.4.

United States Environmental Protection Agency (USEPA). December 2005. Stormwater Phase II Final Rule - Fact Sheet 2.5.

United States Environmental Protection Agency (USEPA). December 2005. Stormwater Phase II Final Rule - Fact Sheet 2.6.

United States Environmental Protection Agency (USEPA). December 2005. Stormwater Phase II Final Rule - Fact Sheet 2.7.

United States Environmental Protection Agency (USEPA). December 2005. Stormwater Phase II Final Rule - Fact Sheet 2.8.

United States Environmental Protection Agency (USEPA). 2011. A grant-funded pilot program focusing on cleaning up Coyote Creek. Clean Creeks, Healthy Communities Program Snapshot.

United States Environmental Protection Agency (USEPA). 2013. Water: Class V Wells: Storm Water Drainage Wells. http://water.epa.gov/type/groundwater/uic/class5/types_stormwater.cfm.

United States Environmental Protection Agency (USEPA). 2013. Water: Low Impact Development (LID). http://water.epa.gov/polwaste/green/.

Weston Solutions. 2010a. City of San Diego Targeted Aggressive Street Sweeping Pilot Study Assessment Final Report, Prepared for City of San Diego Stormwater Department. San Diego, CA. 77 pp.

Weston Solutions. 2010b. Rain Barrel Downspout Disconnect BMP Effectiveness Monitoring and Operations Program Final Report. City of San Diego Storm Water Department. San Diego, CA. 62 pp.

Weston Solutions. 2009a. San Diego River Source Tracking Investigation – Phase I, Final Report Revision 1. Prepared for City of San Diego Storm Water Department. San Diego, CA. 132 pp.

Weston Solutions. 2009b. San Diego River Source Tracking Investigation – Phase II, Final Report Revision 1. Prepared for City of San Diego Storm Water Department. San Diego, CA.

Appendix A

June 27, 2013, Los Angeles River Upper Reach 2 WMA Notice of Intent (NOI) Letter

City of Commerce

Office of the
City Administrator

June 27, 2013

Mr. Sam Unger
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region, Suite 200
320 W. Fourth St., Suite 200
Los Angeles, CA 90013

RE: Notice of Intent for a Watershed Management Program and Coordinated Integrated Monitoring Program for the Los Angeles River Upper Reach 2 Gateway Sub Watershed.

Dear Mr. Unger:

The Permittees listed in Table 1 below that are party to this Notice of Intent (NOI) hereby notify the Los Angeles Regional Water Quality Control Board (Regional Water Board) of their intent to develop a Watershed Management Program (WMP) for the Los Angeles River Upper Reach 2 Sub Watershed (LAR UR2 Sub Watershed) which includes the Cities of Bell, Bell Gardens, Cudahy, Commerce, Huntington Park, Maywood, Vernon, and the Los Angeles County Flood Control District. This NOI is hereby submitted in accordance with Part VI.C.4.b.i of Order R4-2012-0175. Permittees meet the LID and Green Streets conditions and will submit the Draft WMP within 18 months of the effective date of Order R4-2012-0175 (June 28, 2014).

In addition, the same permittees listed in Table 1 hereby notify the Regional Water Board of their intent to develop a Coordinated Integrated Monitoring Program (CIMP) as part of their WMP. The Permittees intend to follow a CIMP approach for each of the required monitoring plan elements including Receiving Water Monitoring, Storm Water Outfall Based Monitoring, Non-Storm Water Outfall Based Monitoring, New Development/Re-Development Effectiveness Tracking, and Regional Studies and will submit the CIMP within 18 months of the effective date of Order R4-2012-0175 (June 28, 2014) with the WMP.

SECTION 1. PROGRAM TYPE AND PERMITTEES

Table 1 lists the permittees who have agreed to work cooperatively and to jointly develop a WMP and CIMP under a Memorandum of Understanding (MOU) with the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority for administration and cost sharing.

Table 1. Watershed Management Program Permittees
City of Bell
City of Bell Gardens
City of Commerce
City of Cudahy
City of Huntington Park
City of Maywood
City of Vernon
Los Angeles County Flood Control District (LACFCD)

SECTION 2. TOTAL MAXIMUM DAILY LOADS ESTABLISHED WATER QUALITY BASED EFFLUENT LIMITATIONS:

Table 2 lists applicable interim and final Water Quality Based Effluent Limitations (WQBELs) and receiving water limitations established by Total Maximum Daily Loads (TMDLs) and identified by Section VI.C.4.B.ii of the Order that occur prior to the anticipated approval of the WMP.

Table 2. Applicable Interim and Final Trash WQBELs and all other Final WQBELs and Receiving Water Limitations Occurring Before Watershed Management Program Approval

TMDL Order	WQBEL	Interim or Final	Compliance Date
Los Angeles River Trash	80% reduction of baseline	Interim	09/30/2013
	90% reduction of baseline	Interim	09/30/2014
	96.7% reduction of baseline	Interim	09/30/2015
	100% reduction of baseline	Final	09/30/2016

Los Angeles River Nitrogen Compounds and Related Effects TMDL	100% of MS4 drainage area complies with waste load allocations	Final	03/23/2004
Los Angeles River Bacteria Implementation Schedule for Dry Weather – upper and middle reach 2 (Figueroa St. to Rosecrans Ave.) R4-2012-0175	Submit a Load Reduction Strategy (LRS) for Segment B (or submit an alternative compliance plan)	Interim	09/23/2014

SECTION 3. IDENTIFY TMDL CONTROL MEASURES:

Table 3 identifies the control measures being implemented by each Permittee for each TMDL that have interim and final WQBELs that occur prior to the anticipated approval of the WMP. The Permittees will continue to implement these measures during the development of the WMP.

Table 3. Control Measures that will be Implemented Concurrently with WMP Development for TMDLs

TMDL	Permittees	Implementation Plan and Control Measures	Status of Implementation
Los Angeles River Trash R4-2012-0175	Cities of: Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon	Install Full Capture Systems or other BMPs to reduce baseline by 80%	Completed
		Install Full Capture Systems or other BMPs to reduce baseline by 90%	Completed
		Install Full Capture Systems or other BMPs to reduce baseline by 96.7%	Completed
Los Angeles River Bacteria Implementation Schedule for Dry Weather – upper and middle reach 2 (Figueroa St. to Rosecrans Ave.) R4-2012-0175	Cities of: Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon	Developed a Coordinated Monitoring Plan (CMP) for the Los Angeles River Watershed.	Submitted the CMP to the LA Regional Water Quality Control Board on March 23, 2013 with the expressed intention of integrating the CMP with a future CIMP.

SECTION 4. DEMONSTRATION OF MEETING LID ORDINANCE AND GREEN STREETS POLICY REQUIREMENTS:

The Permittees that are party to this NOI developed LID Ordinances and Green Streets Policies that are in the process of being adopted by their governing board.**Table 4** summarizes the status of the Permittees' LID ordinances and Green Streets policies. More than 50% of the MS4 watershed area that will be addressed by the WMP is covered by LID Ordinances and Green Streets Policies.

Table 4. Status of LID Ordinance and Green Streets Policy Coverage of the MS4 Watershed Area Addressed by the WMP

Permittee	Land Area (mi^2)	LID Ordinance Status	Green Streets Policy Status
City of Bell	2.64	Developed	Developed
City of Bell Gardens	2.49	Adopted	Adopted
City of Commerce	6.57	Adopted	Adopted
City of Cudahy	1.12	Developed	Adopted
City of Huntington Park	3.03	Developed	Adopted
City of Maywood	1.18	Developed	Adopted
City of Vernon	5.16	Developed	Developed
LACFCD	0	N/A	N/A
Total MS4 Watershed Area	22.19		

The listed permittees are diligently working together and making progress towards compliance with Order R4-2012-0175. Please contact the individual permittees should you have questions pertaining to their jurisdiction's compliance measures. A list of contact information is enclosed. Please direct all inquiries regarding the LAR UR2 Sub Watershed's WMP/CIMP development to Ms. Claudia Arellano at carellano@ci.vernon.ca.us or (323) 583-8811, ext. 258. Thank you.

Sincerely,

The LAR UR2 Sub Watershed Permittees
(Individual signatures enclosed)

cc: Ms. Renee Purdy, California Regional Water Quality Control Board
Mr. Ivar Ridgeway, California Regional Water Quality Control Board

6330 Pine Avenue
Bell, California 90201
(323) 588-6211
(323) 771-9473 fax

CITY OF BELL

June 12, 2013

Mr. Samuel Unger, P.E., Executive Officer
California Regional Water Quality
Control Board – Los Angeles Region
320 West Fourth Street, Suite 200
Los Angeles, CA 90013

Attention: Ms. Renee Purdy

Dear Mr. Unger:

LETTER OF INTENT – LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
LOS ANGELES RIVER UPPER REACH 2 SUB WATERSHED
WATERSHED MANAGEMENT PROGRAM
AND COORDINATED INTEGRATED MONITORING PROGRAM

The City of Bell submits this Letter of Intent to participate in and share the cost of the development of a Watershed Management Program (WMP) and a Coordinated Integrated Monitoring Program (CIMP) with the Los Angeles River Upper Reach 2 Sub Watershed Group. This Letter of Intent serves to satisfy the WMP notification requirements of Section VI.C.4.b. of Order No. R4-2012-0175 (Municipal Separate Storm Sewer System Permit) and the CIMP requirements of Section IV.C.1 of Attachment E of the Municipal Separate Storm Sewer System Permit.

The Los Angeles River Upper Reach 2 Sub Watershed Group consists of the following agencies: the cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the LACFCD. The City of Bell intends to submit a final Memorandum of Understanding to the City Council for approval on July 17th, 2013.

If you have any questions, please contact Mr. Terry Rodrigue at (323)588-6211 or trodrigue@cityofbell.org.

Sincerely,

Doug Wilmore
City Manager

The Watershed Permittees, described as the LAR UR2 Sub Watershed, made and entered into an MOU by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA), a California Joint Powers Authority, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD). In said MOU and pursuant to Section V.C.4.b of the MS4 Permit Order R4-2012-0175, the Watershed Permittees agreed to jointly draft, execute and submit to the Los Angeles Regional Water Quality Control Board, a Notice of Intent (NOI) letter by June 28, 2013 that complies with all applicable MS4 Permit provisions for development of a joint Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) and execute such joint NOI as follows:

DATE: 6/19/13

CITY OF BELL GARDENS
Mr. Philip Wagner
City Manager
7100 Garfield Avenue
Bell Gardens, CA 90201

Philip Wagner, City Manager

The Watershed Permittees, described as the LAR UR2 Sub Watershed, made and entered into an MOU by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA), a California Joint Powers Authority, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD). In said MOU and pursuant to Section V.C.4.b of the MS4 Permit Order R4-2012-0175, the Watershed Permittees agreed to jointly draft, execute and submit to the Los Angeles Regional Water Quality Control Board, a Notice of Intent (NOI) letter by June 28, 2013 that complies with all applicable MS4 Permit provisions for development of a joint Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) and execute such joint NOI as follows:

DATE: 06/13/2013

CITY OF COMMERCE
Mr. Jorge Rifa
City Administrator
2535 Commerce Way
Commerce, CA 90040

Jorge Rifa, City Administrator

The Watershed Permittees, described as the LAR UR2 Sub Watershed, made and entered into an MOU by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA), a California Joint Powers Authority, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD). In said MOU and pursuant to Section V.C.4.b of the MS4 Permit Order R4-2012-0175, the Watershed Permittees agreed to jointly draft, execute and submit to the Los Angeles Regional Water Quality Control Board, a Notice of Intent (NOI) letter by June 28, 2013 that complies with all applicable MS4 Permit provisions for development of a joint Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) and execute such joint NOI as follows:

DATE: 6/19/13

CITY OF CUDAHY
Mr. Hector Rodriguez
City Manager
5220 Santa Ana Street
Cudahy, CA 90201

Hector Rodriguez, City Manager

The Watershed Permittees, described as the LAR UR2 Sub Watershed, made and entered into an MOU by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA), a California Joint Powers Authority, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD). In said MOU and pursuant to Section V.C.4.b of the MS4 Permit Order R4-2012-0175, the Watershed Permittees agreed to jointly draft, execute and submit to the Los Angeles Regional Water Quality Control Board, a Notice of Intent (NOI) letter by June 28, 2013 that complies with all applicable MS4 Permit provisions for development of a joint Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) and execute such joint NOI as follows:

DATE: 6/24/13

CITY OF HUNTINGTON PARK
Mr. Rene Bobadilla, P.E.
City Manager
6550 Miles Avenue
Huntington Park, CA 90255

Rene Bobadilla, City Manager

The Watershed Permittees, described as the LAR UR2 Sub Watershed, made and entered into an MOU by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA), a California Joint Powers Authority, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD). In said MOU and pursuant to Section V.C.4.b of the MS4 Permit Order R4-2012-0175, the Watershed Permittees agreed to jointly draft, execute and submit to the Los Angeles Regional Water Quality Control Board, a Notice of Intent (NOI) letter by June 28, 2013 that complies with all applicable MS4 Permit provisions for development of a joint Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) and execute such joint NOI as follows:

DATE: 6-25-13

CITY OF MAYWOOD
Ms. Lilian Myers
City Manager
4319 East Slauson Avenue
Maywood, CA 90270

Lilian Myers, City Manager

The Watershed Permittees, described as the LAR UR2 Sub Watershed, made and entered into an MOU by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA), a California Joint Powers Authority, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD). In said MOU and pursuant to Section V.C.4.b of the MS4 Permit Order R4-2012-0175, the Watershed Permittees agreed to jointly draft, execute and submit to the Los Angeles Regional Water Quality Control Board, a Notice of Intent (NOI) letter by June 28, 2013 that complies with all applicable MS4 Permit provisions for development of a joint Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) and execute such joint NOI as follows:

DATE: 6-20-13

CITY OF VERNON
Mr. Samuel Kevin Wilson, P.E.
Director of Community Services & Water
4305 Santa Fe Avenue
Vernon, CA 90058

Samuel Kevin Wilson, Director of
Community Services & Water

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: WM-7

June 24, 2013

Mr. Samuel Unger, P.E.
Executive Officer
California Regional Water Quality
Control Board – Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention Ms. Renee Purdy

Dear Mr. Unger:

LETTER OF INTENT – LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
LOS ANGELES RIVER UPPER REACH 2 SUB WATERSHED
WATERSHED MANAGEMENT PROGRAM
AND COORDINATED INTEGRATED MONITORING PROGRAM

The Los Angeles County Flood Control District (LACFCD) submits this Letter of Intent to participate in and share the cost of the development of a Watershed Management Program (WMP) and a Coordinated Integrated Monitoring Program (CIMP) with the Los Angeles River Upper Reach 2 Sub Watershed Group. This Letter of Intent serves to satisfy the WMP notification requirements of Section VI.C.4.b. of Order No. R4-2012-0175 (Municipal Separate Storm Sewer System Permit) and the CIMP requirements of Section IV.C.1 of Attachment E of the Municipal Separate Storm Sewer System Permit.

The Los Angeles River Upper Reach 2 Sub Watershed Group consists of the following agencies: LACFCD and cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon. The LACFCD intends to submit a final Memorandum of Understanding to the County of Los Angeles Board of Supervisors (which is the LACFCD's governing body) for approval prior to December 28, 2013.

If you have any questions, please contact Ms. Terri Grant at (626) 458-4309 or tgrant@dpw.lacounty.gov.

Very truly yours,

for GAIL FARBER
Chief Engineer of the Los Angeles County Flood Control District

TA:jht
P:\wmpub\Secretarial\2013 Documents\Letter\LOI LAR UR2 LACFCD.doc\C13230

cc: City of Bell
City of Bell Gardens
City of Commerce
City of Cudahy
City of Huntington Park
City of Maywood
City of Vernon

Watershed Permittee Contact List

Permittee	*Contact*	*Contact Mailing Address*	*Contact Telephone and Email Address*
City of Bell	Young Park Terry Rodrigue	6330 Pine Ave. Bell, CA 90201	(323) 588-6211 Ext 228 ypark@cityofbell.org trodrigue@cityofbell.org
City of Bell Gardens	Chau Vu	7100 Garfield Ave. Bell Gardens, CA 90201	(562) 334-1790 cvu@bellgardens.org
City of Commerce	Gina Nila Environmental Services Manager	2535 Commerce Way Commerce, CA 90040	(323) 722-4805, ext. 2839 ginan@ci.commerce.ca.us
City of Cudahy	Aaron Hernandez-Torres Assistant City Engineer	5220 Santa Ana St. Cudahy, CA 90201	(323) 773-5143 ahernandez@cityofcudayca.gov
City of Huntington Park	James A. Enriquez Director of Public Works/City Engineer	6550 Miles Ave. Huntington Park, CA 90255	(323) 584-6253 jenriquez@huntingtonpark.org
City of Maywood	Andre Dupret	4319 E. Slauson Ave. Maywood, CA 90270	(323) 562-5700 andre.dupret@cityofmaywood.org
City of Vernon	Samuel Kevin Wilson, P.E. Director of Community Services & Water	4305 Santa Fe Ave. Vernon, CA 90058	(323) 583-8811, ext. 245 kwilson@ci.vernon.ca.us
	Claudia Arellano Project Engineer		(323) 583-8811, ext. 258 carellano@ci.vernon.ca.us
LACFCD	Gary Hildebrand	900 S. Freemont Ave. Alhambra, CA 91803	(626) 458-4300 ghildeb@dpw.lacounty.gov

Appendix B

September 25, 2013, Approval of NOIU to Develop WMP Letter

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

Los Angeles Regional Water Quality Control Board

September 25, 2013

Los Angeles River Upper Reach 2 Sub-watershed Management Group
(See Distribution List)

APPROVAL OF NOTIFICATION OF INTENT (NOI) TO DEVELOP A WATERSHED MANAGEMENT PROGRAM (WMP), PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT (NPDES PERMIT NO. CAS004001; ORDER NO. R4-2012-0175)

Dear Los Angeles River Upper Reach 2 Sub-watershed Management Group Participants:

Regional Board staff received and reviewed the NOI to prepare a WMP that the Los Angeles River Upper Reach 2 Sub-watershed Management Group submitted to the Regional Board on June 27, 2013. According to the NOI, the participants in the Los Angeles River Upper Reach 2 Sub-watershed Management Group are the Los Angeles County Flood Control District, and the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon. Upon review, Regional Board staff determined the NOI meets the notification requirements of Part VI.C of Order No. R4-2012-0175, *Waste Discharge Requirements for MS4 Discharges within the Coastal Watersheds of Los Angeles County, except those Discharges Originating from the City of Long Beach* (hereafter, Order).

As you are aware, the Order allows permittees the option to submit to the Regional Board for approval an NOI to prepare a WMP. Preparing a WMP allows permittees to implement the requirements of the Order on a watershed scale through customized strategies, control measures, and best management practices (BMPs). Implementing a WMP allows permittees to address the highest watershed priorities, including complying with the requirements of Part V.A (Receiving Water Limitations), Part VI.E (Total Maximum Daily Load Provisions) and Attachments L through R, by customizing the control measures in Parts III.A (Prohibitions – Non-Storm Water Discharges) and VI.D (Minimum Control Measures) of the Order.

The Los Angeles River Upper Reach 2 Sub-watershed Management Group must submit to the Regional Board for review and approval a draft WMP for the Los Angeles River Upper Reach 2 Sub-watershed no later than June 28, 2014. Until Regional Board staff approves the Los Angeles River Upper Reach 2 Sub-watershed Management Group

WMP, each Los Angeles River Upper Reach 2 Sub-watershed Management Group participant must do the following:

1. Continue to implement all the watershed control measures in their corresponding storm water management programs, including actions within each of the six categories of minimum control measures consistent with Title 40 Code of Federal Regulations Section 122.26(d)(2)(iv) and Part VI.C.4.d.i of the Order.
2. Continue to implement watershed control measures to eliminate non-storm water discharges through the MS4 that are a source of pollutants to receiving waters consistent with Clean Water Act Section 402(p)(3)(B)(ii) and Part VI.C.4.d.ii of the Order.
3. Implement watershed control measures, including those identified in existing TMDL implementation plans, to ensure MS4 discharges achieve compliance with interim and final trash WQBELs and all other final WQBELs and receiving water limitations pursuant to Part VI.E and set forth in Attachments L through Q by the applicable compliance deadlines occurring prior to approval of the WMP per Part VI.C.4.d.iii of the Order.
4. Target implementation of watershed control measures listed above to address known contributions of pollutants from MS4 discharges to receiving waters.
5. Meet all interim and final deadlines for development of a WMP.

If you have any questions, please contact Ms. Pavlova Vitale of the Storm Water Permitting Unit by electronic mail at Pavlova.Vitale@waterboards.ca.gov or by phone at (213) 576-6761. Alternatively, you may also contact Mr. Ivar Ridgeway, Chief of the Storm Water Permitting Unit, by electronic mail at Ivar.Ridgeway@waterboards.ca.gov or by phone at (213) 620-2150.

Sincerely,

Samuel Unger

Samuel Unger, P.E.
Executive Officer

cc: Young Park, City of Bell
Chau Vu, City of Bell Gardens
Gina Nila, City of Commerce
Aaron Herandez-Torres, City of Cudahy
James Enriquez, City of Huntington Park
Andre Dupret, City of Maywood
Samuel Kevin Wilson, City of Vernon
Gary Hildebrand, Los Angeles County Flood Control District
Dave Smith, US EPA
Walt Shannon, State Water Resources Control Board – Storm Water Section
Jennifer Fordyce, State Water Resources Control Board – Office of Chief Counsel

ECM#

Distribution List for the Los Angeles River Upper Reach 2 Sub-watershed Management Group

1. Doug Wilmore, City Manager
   City of Bell
   6330 Pine Avenue
   Bell, CA 90201

2. Philip Wagner, City Manager
   City of Bell Gardens
   7100 Garfield Avenue
   Bell Gardens, CA 90201

3. Jorge Rifa, City Administrator
   City of Commerce
   2535 Commerce Way
   Commerce, CA 90040

4. Hector Rodriguez, City Manager
   City of Cudahy
   5220 Santa Ana Street
   Cudahy, CA 90201

5. Renee Bobadilla, City Manager
   City of Huntington Park
   6550 Miles Avenue
   Huntington Park, CA 90255

6. Lilian Myers, City Manager
   City of Maywood
   4319 East Slauson Avenue
   Maywood, CA 90270

7. Kevin Wilson, Director of Community Services and Water
   City of Vernon
   4305 Santa Fe Avenue
   Vernon, CA 90058

8. Gail Farber, Chief Engineer
   Los Angeles County Flood Control District
   900 South Freemont Avenue
   Alhambra, CA 91803

Appendix C

MS4 Permit LAR Watershed TMDL Water Quality Objectives

This Appendix outlines the Water Quality-Based Effluent Limitations (WQBELs) and Receiving Water Limitations (RWLs) identified in Attachment O of the MS4 Permit. The following Total Maximum Daily Loads (TMDLs) are applicable to the Los Angeles River Upper Reach 2 Watershed Management Area (LAR UR2 WMA):

- Los Angeles River Trash TMDL
- Los Angeles River Nitrogen Compounds and Related Effects TMDL
- Los Angeles River and Tributaries Metals TMDL
- Los Angeles River Watershed Bacteria TMDL

LAR Watershed Trash TMDL

The litigation and implementation history of the Los Angeles River Watershed Trash TMDL is complex, however the current TMDL was adopted by the Los Angeles Regional Water Quality Control Board (LARWQCB) as Resolution 2007-012, which became effective on September 23, 2008. Simplistically, TMDL compliance is assessed based on Daily Generation Rate (DGR) studies, the remainder of the catchment not protected by Full Capture Certified Devices (FCCDs), or a combination of both metrics. **Table C-1** and **Table C-2** list (in gallons and pounds) interim and final DGR estimated residual WQBELs from Attachment O Part A.3 of the MS4 Permit, while the allowable remainder of the catchment unprotected by FCCDs is identified in parentheses within the table header rows.

Table C-1 LAR Watershed Trash TMDL Effluent Limitations per Storm Year (gal of uncompressed trash)

Permittees	Baseline	2012 (30%)	2013 (20%)	2014 (10%)	2015 (3.3%)	2016 (0%)
Bell	16026	4808	3205	1603	529	0
Bell Gardens	13500	4050	2700	1350	446	0
Commerce	58733	17620	11747	5873	1938	0
Cudahy	5935	1781	1187	594	196	0
Huntington Park	19159	5748	3832	1916	632	0
Maywood	6129	1839	1226	613	202	0
Vernon	47203	14161	9441	4720	1558	0

Table C-2 LAR Watershed Trash TMDL Effluent Limitations per Storm Year (lbs of drip dry trash)

Permittees	Baseline	2012 (30%)	2013 (20%)	2014 (10%)	2015 (3.3%)	2016 (0%)
Bell	25337	7601	5067	2534	836	0
Bell Gardens	23371	7011	4674	2337	771	0
Commerce	85481	25644	17096	8548	2821	0
Cudahy	10061	3018	2012	1006	332	0
Huntington Park	30929	9279	6186	3093	1021	0
Maywood	10549	3165	2110	1055	348	0
Vernon	66814	20044	13363	6681	2205	0

The final WQBEL of zero trash discharged, or catchment area unprotected, is to be achieved for the 2016 storm year that begins on October 1, 2015 and ends on September 30, 2016. During the current period from October 1, 2013 to September 30, 2014, 90% of the baseline study trash volume or weight must be

captured based on DGR study analysis and only 10% estimated to have been discharged. Alternatively, 90% of a Permittee catchment may be protected by FCCDs, leaving 10% unprotected.

LAR Nitrogen Compounds and Related Effects TMDL

The LAR Nitrogen TMDL was adopted by the LARWQCB as Resolution 2003-009 and became effective on March 23, 2004. Site Specific Objectives (SSOs) for ammonia were approved by the State Water Resources Control (SWRCB) Board on June 4, 2013. This TMDL has been primarily addressed by Publically Owned Treatment Works (POTWs), or Water Recovery Plants (WRPs), and MS4 Permittee discharges do not appear to cause or contribute to the exceedance of the applicable RWLs. **Table C-3** lists the currently effective TMDL WQBELs, as identified in Attachment O, Part B.2 of the MS4 Permit, which the LAR UR2 WMA Permittee discharges would be expected to comply with as assessed through the Coordinated Integrated Monitoring Program (CIMP).

Table C-3 LAR Nitrogen Compounds and Related Effects TMDL Final WQBELs

Water Body	NH_3-N (mg/L)		NO_3-N (mg/L)	NO_2-N (mg/L)	NO_3-N+NO_2-N (mg/L)
	One-hour Average	Thirty-day Average	Thirty-day Average	Thirty-day Average	Thirty-day Average
LAR below LAG	8.7	2.4	8.0	1.0	8.0
Rio Hondo Reach 1 and 2	10.1	2.3	8.0	1.0	8.0

LAG = Los Angeles-Glendale WRP

LAR and Tributaries Metals TMDL

The litigation and implementation history of the LAR and Tributaries Metals TMDL is complex, however the current TMDL was adopted by the LARWQCB as Resolution 2007-014 and became effective on October 29, 2008. The TMDL assesses compliance based on the load or concentration of several metals in comparison to the California Toxic Rule (CTR) values, during dry- and wet-weather conditions. Dry-weather is defined as days when the maximum daily flow in the Los Angeles River is less than 500 cubic feet per second (cfs) as measured at the Wardlow Street gauge station in Long Beach. Since metal toxicity is correlated to bioavailability, which is higher for dissolved metals, and decreases in the presence of competing cations, as assessed by water hardness, the permit and TMDL WQBEL values were determined using total to dissolved "translator" values, prepared by the USEPA, weather, and water body specific hardness data, which results in relatively significant variability in WQBELs among the various water body and weather combinations. Furthermore, local water characteristics, such as organic content, may result in Water Effect Ratios (WERs) and SSOs that alter the preliminary toxicity assessment used in developing a TMDL and may change the final numeric WQBELs.

Table C-4 through **Table C-7** list the "final" WQBELs that may be of importance to the Los Angeles River Upper Reach 2 Watershed Management Area (LAR UR2 WMA), subject to any future basin plan amendments, established by the LAR and Tributaries Metals TMDL and identified in Attachment O Parts C.2 and C.3 of the MS4 Permit. **Table C-4** lists the grouped (shared) dry-weather final WQBELs, expressed as total recoverable metals daily loads. Dry-weather flows in Rio Hondo Reach 1, have normally been much lower than the TMDL estimate of 0.5 cfs, however TMDL watershed compliance has generally been first assessed based on concentration, rather than load.

Table C-4 LAR Metals TMDL Dry-Weather Final WQBELs Expressed as Total Recoverable Metals			
Water Body	**Effluent Limitations Daily Maximum (kg/day)**		
	Copper	**Lead**	**Zinc**
LAR Reach 2	WER[1] x 0.13	WER[1] x 0.07	--
LAR Reach 1	WER[1] x 0.14	WER[1] x 0.07	--
Rio Hondo Reach 1	WER[1] x 0.01	WER[1] x 0.006	WER[1] x 0.16

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

Concentration based dry-weather WQBEL that may be of importance to the RH/SGRWQG are summarized in **Table C-5**.

Table C-5 LAR Metals TMDL Concentration Based Dry-Weather Final WQBELs Expressed as Total Recoverable Metals			
Water Body	**Effluent Limitations Daily Maximum (µg)**		
	Copper	**Lead**	**Zinc**
LAR Reach 2	WER[1] x 22	WER[1] x 11	--
LAR Reach 1	WER[1] x 23	WER[1] x 12	--
Rio Hondo Reach 1	WER[1] x 13	WER[1] x 5.0	WER[1] x 131

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

Load and approximate concentration based wet-weather WQBELs that are applicable to the LAR UR2 WMA are summarized in **Table C-6**. Since the TMDL includes both Waste Loads (WLs) and WLAs, and multiple discharge groups, the WQBEL concentration for MS4 Permittees varies with the volume of runoff measured at Wardlow Street, but the rightmost column is a serviceable first order estimate.

Table C-6 LAR Metals TMDL Wet-Weather Final WQBEL Expressed as Total Recoverable Metals		
Constituent	**Effluent Limitations Daily Maximum (kg/day)**	**Approximate Effluent Limitation (µg/L)**
Cadmium	WER[1] x 2.8 x 10^{-9} x daily volume (L) - 1.8	WER[1] x 2.8
Copper	WER[1] x 1.5 x 10^{-8} x daily volume (L) - 9.5	WER[1] x 15
Lead	WER[1] x 5.6 x 10^{-8} x daily volume (L) - 3.85	WER[1] x 56
Zinc	WER[1] x 1.4 x 10^{-7} x daily volume (L) - 83	WER[1] x 140

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

Table C-7 outlines the interim and final Metals TMDL WQBELs schedule which Permittees are expected to comply with through the EWMP and RAA development process. The LAR UR2 WMA affected by this TMDL is located within Jurisdictional Group 2, thus it should be noted that the June 29, 2012 Implementation Study, funded by the Permittees, identified Watershed Control Measures to achieve the interim and final WQBELs. Among the more important measures was State Senate Bill 346, chaptered in September 2010, which called for phased elimination of copper from automotive friction (brake) pads. A

similar effort to reduce the zinc content in automotive tires has also been initiated, but is many years from being chaptered.

Table C-7 LAR Metals TMDL Schedule of Interim and Final WQBELs

Deadline	Total Drainage Area Served by the MS4 required to meet the water quality-based effluent limitations (%)	
	Dry-Weather	Wet-Weather
January 11, 2012	50	25
January 11, 2020	75	-
January 11, 2024	100	50
January 11, 2028	100	100

Along with most other LAR Watershed municipalities, the LAR UR2 WMA Permittees supported a study to develop Copper WER and Lead Recalculation SSOs that will become effective after it has been approved by the LARWQCB as Basin Plan Amendments. The draft study reports suggest that for copper, in both dry- and wet-weather, a final WER of 3.971 for LAR Reaches 1 and 2 and 9.691 for the Rio Hondo should be adopted. The lead recalculation study suggest that during dry-weather the WQBELs for LAR Reach 1 should increase from 12 to 102 µg/L for LAR Reach 1, increase from 11 to 94 µg/L for LAR Reach 2, and rise from 5 to 37 µg/L for the Rio Hondo. In wet-weather, the lead WQBEL should increase from 62 to 94 µg/L in all of these water bodies. Favorable translators between total and dissolved metal concentrations were also determined by these studies, but are not explicitly referenced in the MS4 Permit so their eventual impact is unclear at this time. As a result of these studies and legislative efforts, the LAR Metals TMDL has probably moved from a regional to specific outfall priority.

LAR Watershed Bacteria TMDL

The LAR Watershed Bacteria TMDL was adopted by the LARWQCB as Resolution 2010-007 and became effective on March 23, 2012. As expressed in Attachment O Part D4 of the MS4 Permit, this TMDL is very complex with multiple implementation phases, river segments that do not coincide with reaches, wet and dry compliance schedules, WLAs expressed as both WQBELs and RWLs, complex analytical methods, and requires the development with submission of Segment Specific Load Reduction Strategies (LRS). In addition, studies indicate that there are significant natural sources including endogenous replication of the "pollutant." **Table C-8** through **Table C-11** summarize the final WQBELs and RWLs that may be of importance to the LAR UR2 WMA.

Table C-8 LAR Bacteria TMDL WQBEL

Constituent	Effluent Limitation (MPN or cfu)	
	Daily Maximum	Geometric Mean
E. coli	235/100 mL	126/100 mL

Table C-9 summaries the "grouped interim dry-weather single sample bacteria WQBEL for the specific river segment and tributaries," that may be of importance to the LAR UR2 WMA. While the Rio Hondo watershed area is approximately half of the total Segment B catchment area and would be expected to generate comparable discharge volumes during dry- and wet-weather, the WQBEL differs by over 250 fold. This is a result of the latter being based on the flow of water, mostly discharged from wastewater treatment plants, into the reach, while the Rio Hondo is primarily a headwater catchment. The interim dry-weather WQBELs are group-based and shared among the Permittees within a drainage area; however, alternatively they may be distributed based on proportion of drainage area, upon approval of the Regional Board Executive Officer. It is currently unclear how compliance with the LAR Bacteria TMDL will be assessed.

Table C-9 LAR Bacteria TMDL Grouped Interim Dry-Weather Single Sample Bacteria WQBEL			
River Segment of Tributary	**Daily Maximum *E. coli* Load (10^9 MPN/day)**	**First Phase Compliance Date**	**Second Phase Compliance Date**
LAR Segment A (Willow to Rosecrans)	301	March 23, 2024	September 23, 2031
LAR Segment B (Rosecrans to Figueroa)	518	March 23, 2022	September 23 2028
Rio Hondo	2	September 23, 2023	March 23, 2030

In addition to WQBELs for MS4 discharges, the LAR Bacteria TMDL includes a RWL that is attributable to all MS4 Permittees, including the City of Long Beach and Caltrans. This RWL is assessed as a limit on the number of days, or weeks, per year, where the RWLs are not achieved. The final compliance dates, for the annually assessed grouped single sample bacteria RWLs, are March 23, 2022 for dry-weather and March 23, 2037 for wet-weather. These requirements can be found in **Table C-10**, while the numeric water quality objective is shown on **Table C-11**.

Table C-10 LAR Bacteria TMDL Grouped Final Single Sample Bacteria RWLs		
Time Period	**Annual Allowable Exceedance Days of the Single Sample Objective (days)**	
	Daily Sampling	**Weekly Sampling**
Dry-Weather	5	1
Non-HFS[1] Waterbodies Wet-Weather	15	2
HFS[1] Waterbodies Wet-Weather	10 (not including HFS days)	2 (not including HFS days)

[1] HFS stands for high flow suspension as defined in Chapter 2 of the Basin Plan

Table C-11 LAR Bacteria TMDL Geometric Mean RWL	
Constituent	**Geometric Mean (MPN or cfu)**
E. coli	126/100 mL

The distinction that these water quality objectives are expressed annually may be important, as MS4 Permit Part VI.A.13.g states that for some WQBELs that are expressed as annual effluent limitations, such as those for trash, violations may only be assessed annually; however Part VI.C.1.d.(i) states that EWMPs must "achieve applicable WQBELs in Part VI.E and Attachments L through R pursuant to the corresponding compliance schedules." It is unclear why an annually assessed WQBEL is substantially and inherently different than an annually assessed RWL, although this question is likely to be resolved long before the dry-weather final compliance schedule is reached.

Appendix D

Summary of Existing Water Quality Studies Relevant to LAR UR2 WMA

This Appendix summarizes the existing water quality studies relevant to the Los Angeles River Upper Reach 2 Watershed Management Area (LAR UR2 WMA), including:

- Los Angeles County Annual Mass Emission and Tributary Station Monitoring Data (2002 – 2012);
- Los Angeles River Metals TMDL Coordinated Monitoring Plan (CMP) Ambient Monitoring Program (2008 – 2013);
- Council for Watershed Health (CWH) Los Angeles River Watershed Monitoring Program (LARWMP) data (2009 – 2012); and
- Cleaner Rivers through Effective Stakeholder-led TMDLs (CREST) Los Angeles River Bacteria Source Identification (BSI) Study.

Los Angeles County Annual Stormwater Monitoring Reports (2002-2012)

The Los Angeles County Department of Public Work Annual Stormwater Monitoring Report (LACDPW SMR) presents stormwater quality findings for each July to June storm season. The 2002–2003, 2003–2004, 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010, 2010-2011, and 2011-2012 monitoring reports addressed the following programs and associated elements:

- Core Monitoring Program – mass emission, tributary, water column toxicity, shoreline, and trash monitoring.
- Regional Monitoring Program – estuary sampling and bioassessment.
- Special studies – New Development Impacts Study in the Santa Clara Watershed, Peak Discharge Impact Study and BMP Effectiveness Study.

Attachment 1, Figure 1 shows the LA River (S10) Core Monitoring program, mass emission station nearest the LAR UR2 WMA, while **Figure 2** shows the Rio Hondo Channel tributary monitoring station studied during the 2002-2003 and 2003-2004 storm seasons. The S10 station is located at the existing stream gauge station (i.e., Stream Gauge F319-R) between Willow Street and Wardlow Road in the City of Long Beach and was chosen to avoid tidal influences. The Rio Hondo Channel monitoring station is located on Beverly Boulevard, downstream of Whittier Narrows dam, at the USGS – U.S. Army Corps of Engineers (ACOE) Stream gage No. 1102300 or E327-R and upstream of the LAR UR2 WMA.

A minimum of three wet-weather and two dry-weather events were monitored for all sites during each annual storm season. Grab samples were collected and analyzed for conventional pollutants and bacteria during both dry- and wet-weather events. Additionally, composite samples were collected for both dry- and wet-weather events and were analyzed for general minerals, metals, semi-volatiles, chlorinated pesticides, organophosphate pesticides, herbicides, PCBs and TSS. A summary of constituents that did not meet applicable WQOs from 2002 – 2012 is as follows:

LAR (S10):

Dry-Weather – a total of 18 samples.
Cyanide – 13 exceedances with a range of values from 0.022 to 0.109 mg/L,
pH –11 exceedances, all greater than 9.0,
TKN – 3 exceedances ranging from 5.82 to 6.18 mg/L,
Nitrite-N – 6 exceedances with a range of values from 1.093 to 1.6039 mg/L, and
Total Phosphorus as P – a total of 2 exceedances.

Wet-Weather –a total of 40 samples.
Cyanide – 9 exceedances with a range of values from 0.024 to 1.2 mg/L,
Dissolved Oxygen (DO) – 1 exceedance with a value of 2.5 mg/L,
pH – 2 exceedances with measurements below 6.5,
Chemical Oxygen Demand (COD) – 1 exceedance, a values of 578 mg/L,
TKN – 13 exceedances with a range of values from 4.9 to 30.68 mg/L,
Total Phosphorus as P – 7 exceedances, and
Total Suspended Solids (TSS) – 24 exceedances ranging from 276 to 2,280 mg/L.

Rio Hondo Channel (TS06):

Dry-Weather, n = 3
Cyanide –1 exceedance with a value of 0.025 mg/L,
pH - 2 exceedances with one under 6.5 and one over 8.5, and
TKN – 1 exceedance with a value of 7 mg/L.

Wet-Weather, n = 9
Cyanide – 1 exceedance with a 0.043 mg/L,
pH – 1 exceedance under 6.5,
Chloride – 1 exceedance with a value of 759 mg/L,
TKN – 2 exceedances with a value of 7 and 12.8 mg/L, and
TSS – 5 exceedances with a range of values from 266 to 1186 mg/L.

Metals

Figure D-1 through **Figure D-5** show measured metal concentrations, and selected standards, for the 2002 to 2012 storm seasons at the Los Angeles River S10 site. **Figure D-6** through **Figure D-11** show measured metal concentrations, and selected standards for the 2002 to 2012 storm seasons at the Rio Hondo TS06 tributary monitoring site. As expected, exceedances were generally higher in wet-weather and assumption of amended WER and Lead Recalculation SSOs, reduced the prevalence of exceedances.

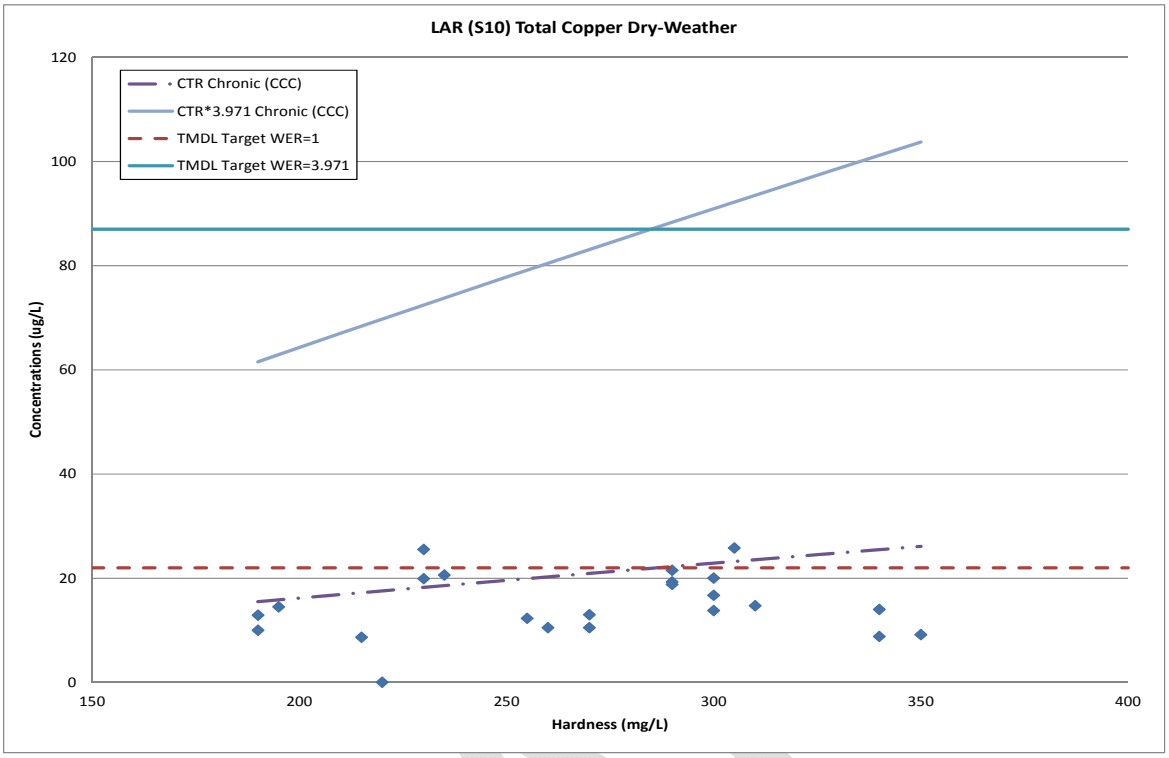


Figure D-1 LAR S10 Total Copper Concentrations Compared to Hardness Monitoring Plot from 2002-2012 storm seasons Dry-Weather

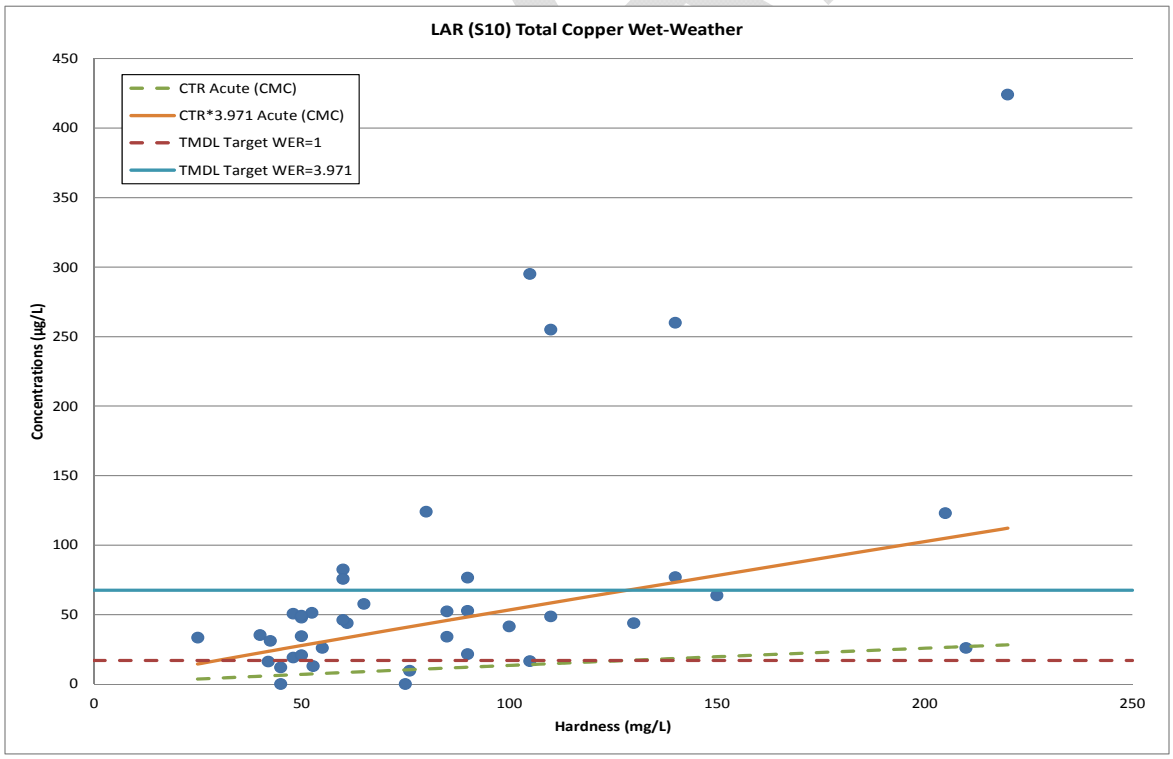


Figure D-2 LAR S10 Total Copper Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Wet-Weather

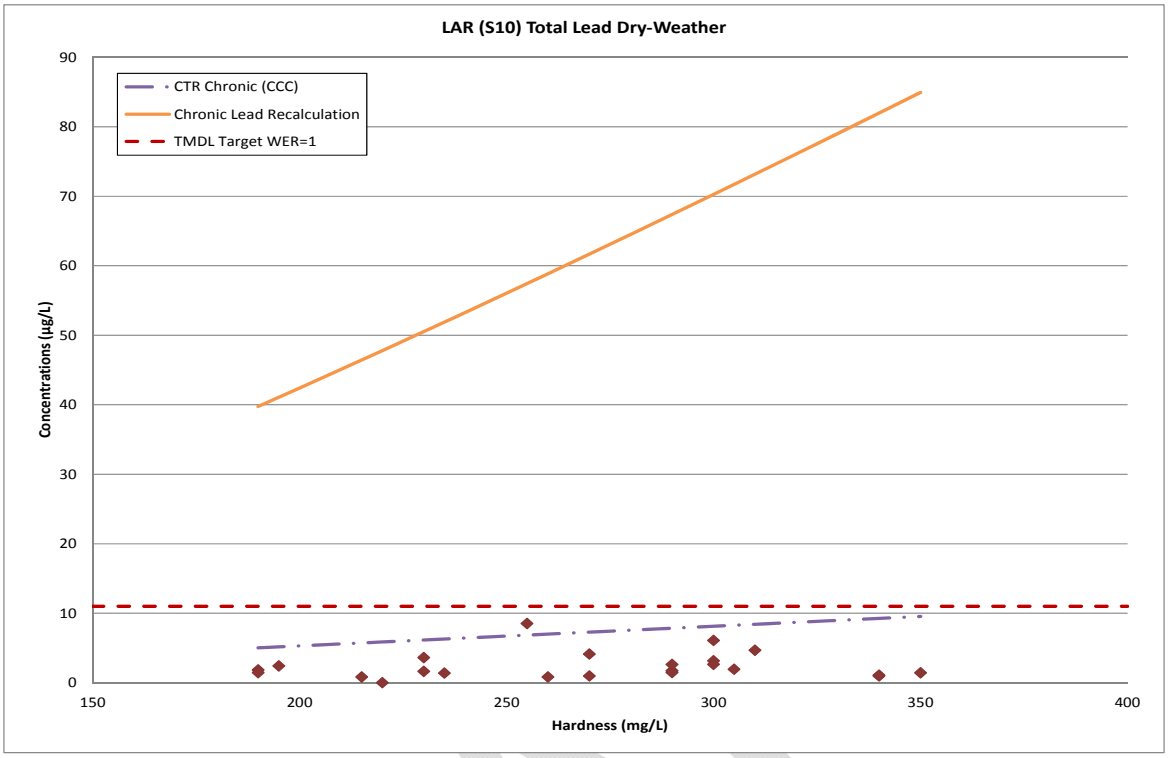


Figure D-3 LAR S10 Total Lead Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Dry-Weather

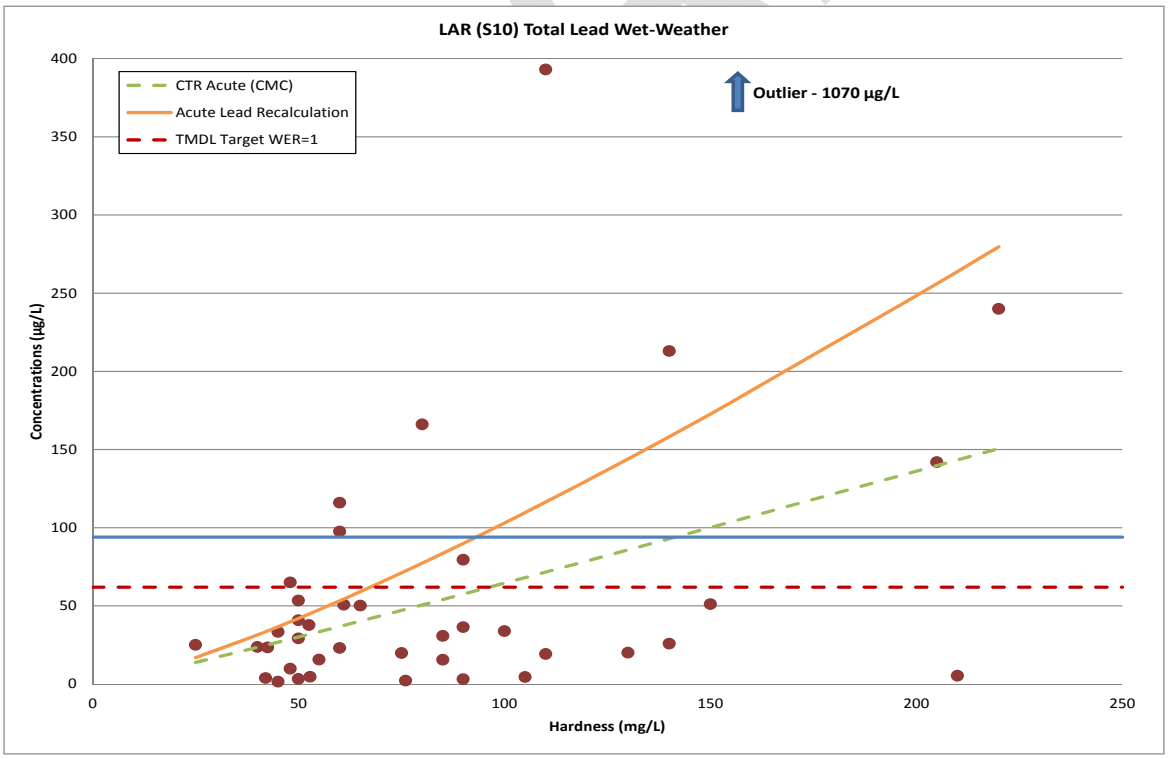


Figure D-4 LAR S10 Total Lead Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Wet-Weather

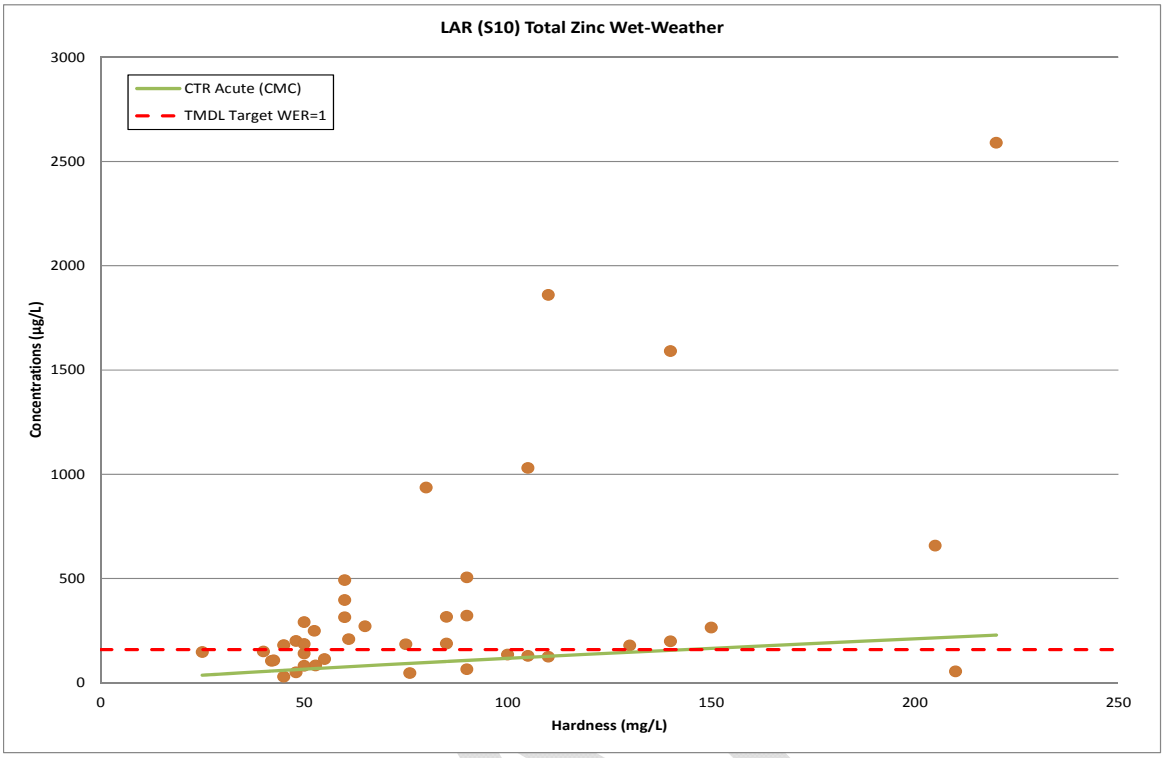


Figure D-5 LAR S10 Total Zinc Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Wet-Weather

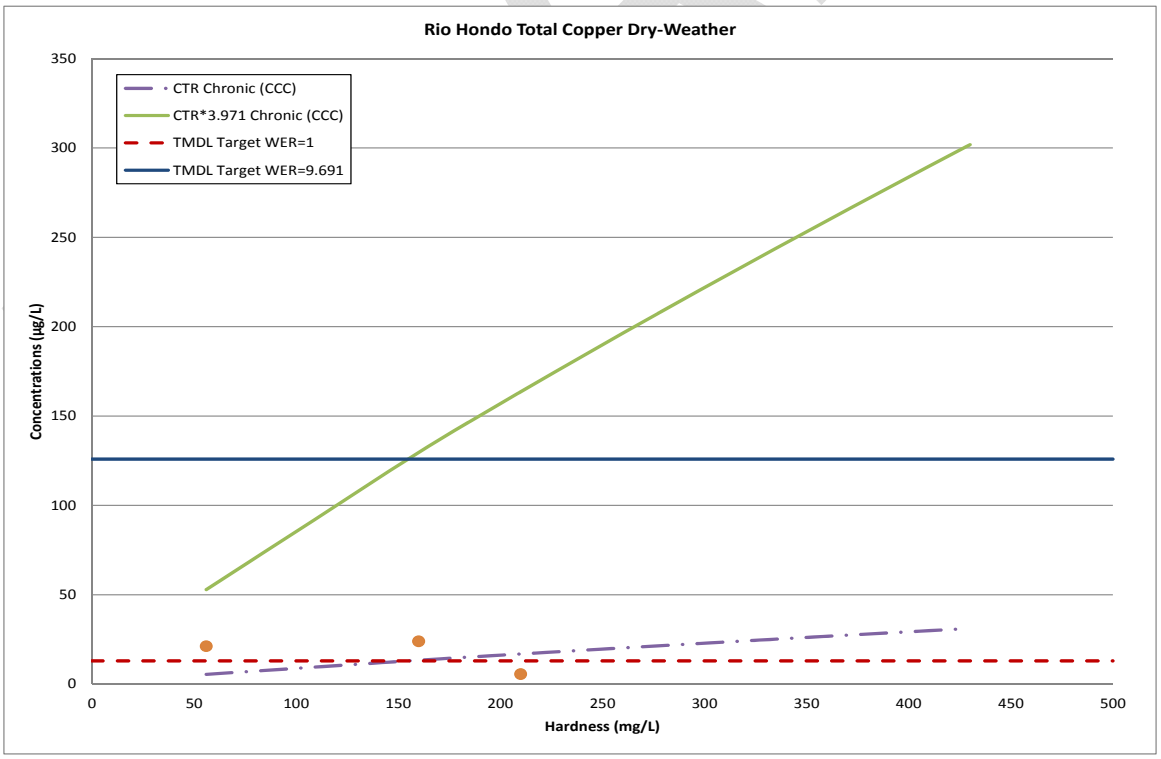


Figure D-6 Rio Hondo Total Copper Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Dry-Weather

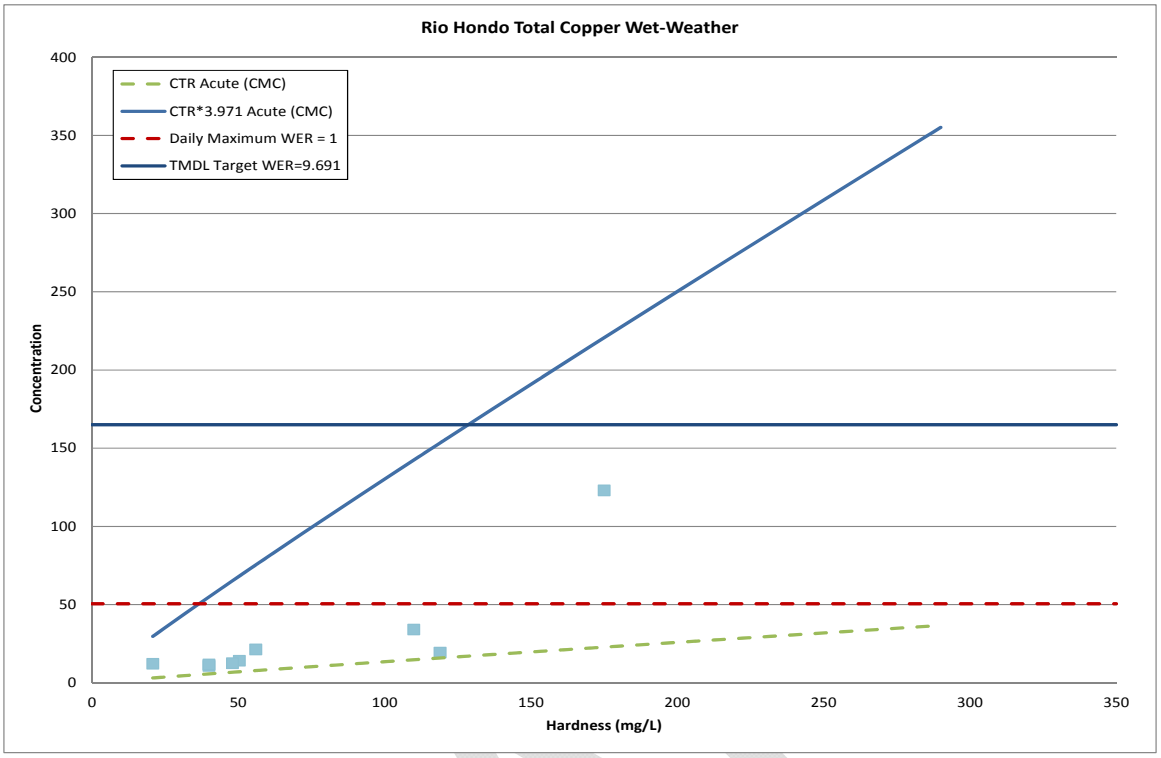


Figure D-7 Rio Hondo Total Copper Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Wet-Weather

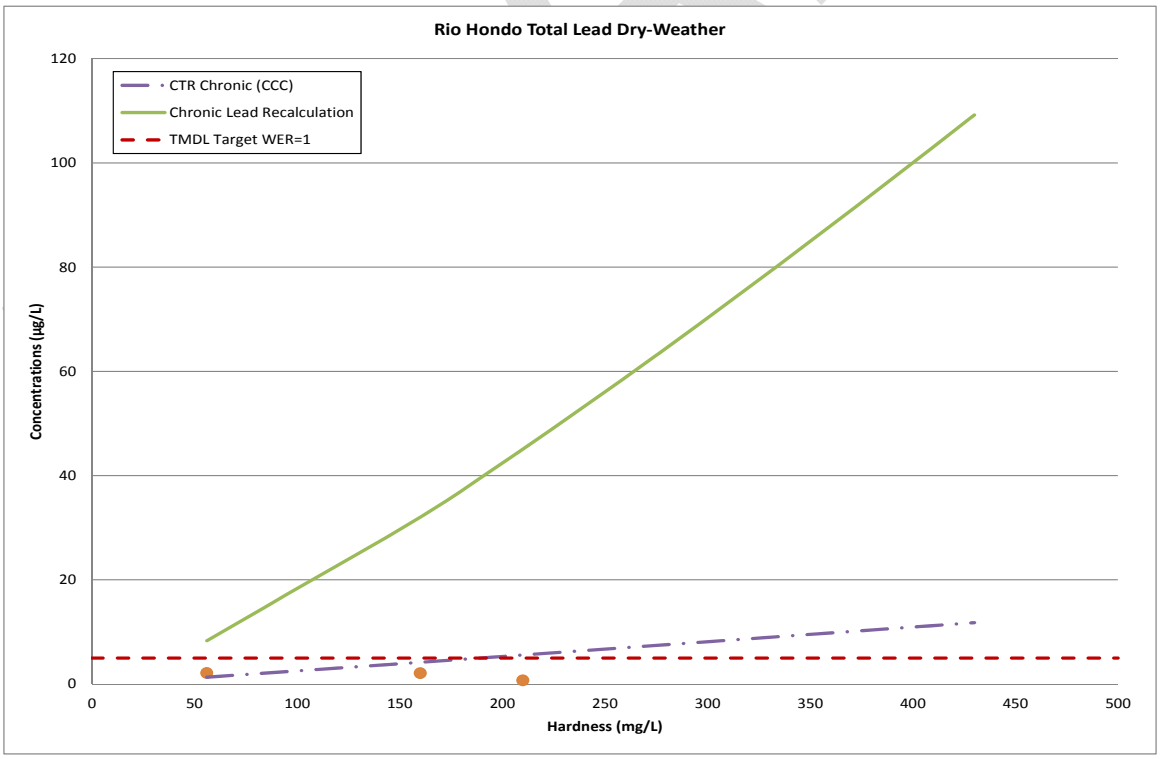


Figure D-8 Rio Hondo Total Lead Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Dry-Weather

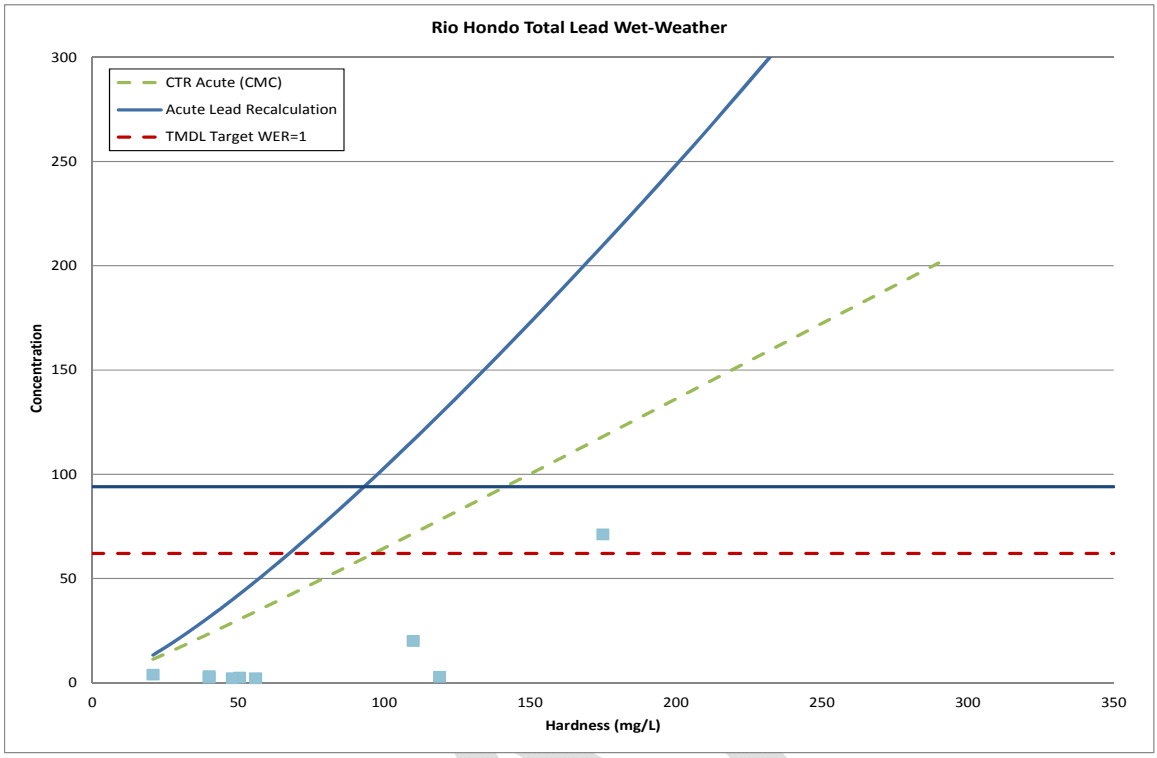


Figure D-9 Rio Hondo Total Lead Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Wet-Weather

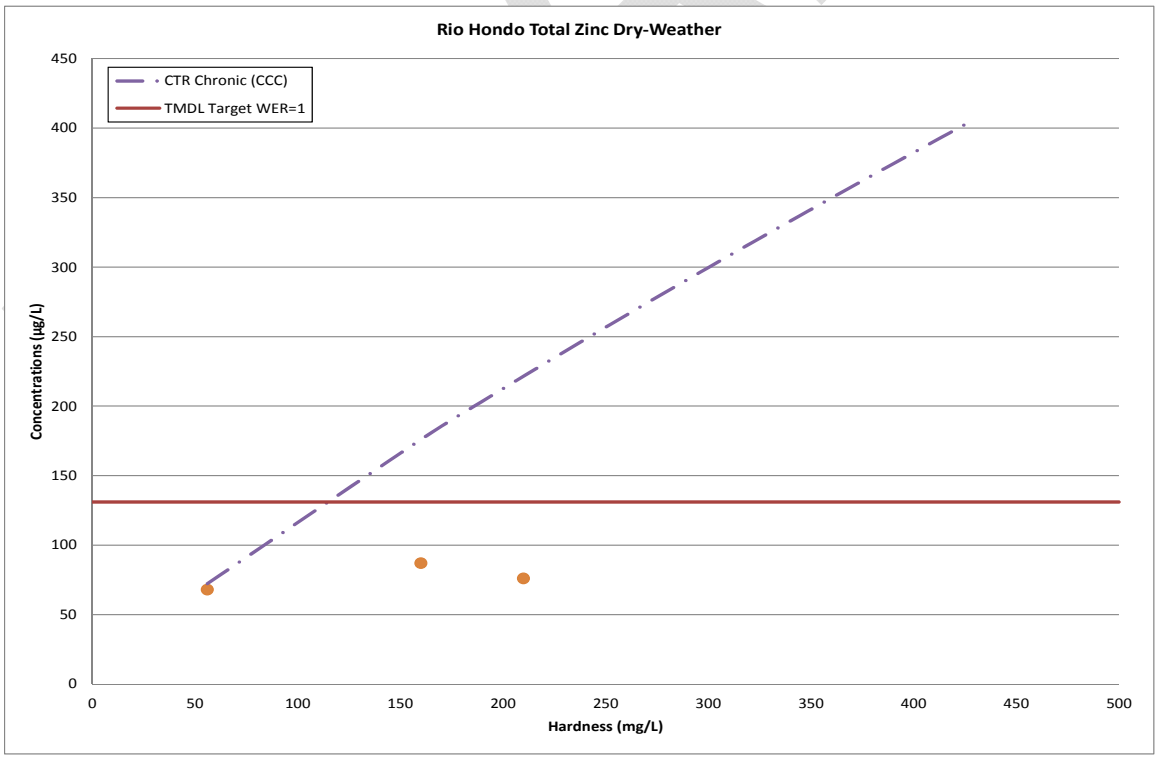


Figure D-10 Rio Hondo Total Zinc Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Dry-Weather

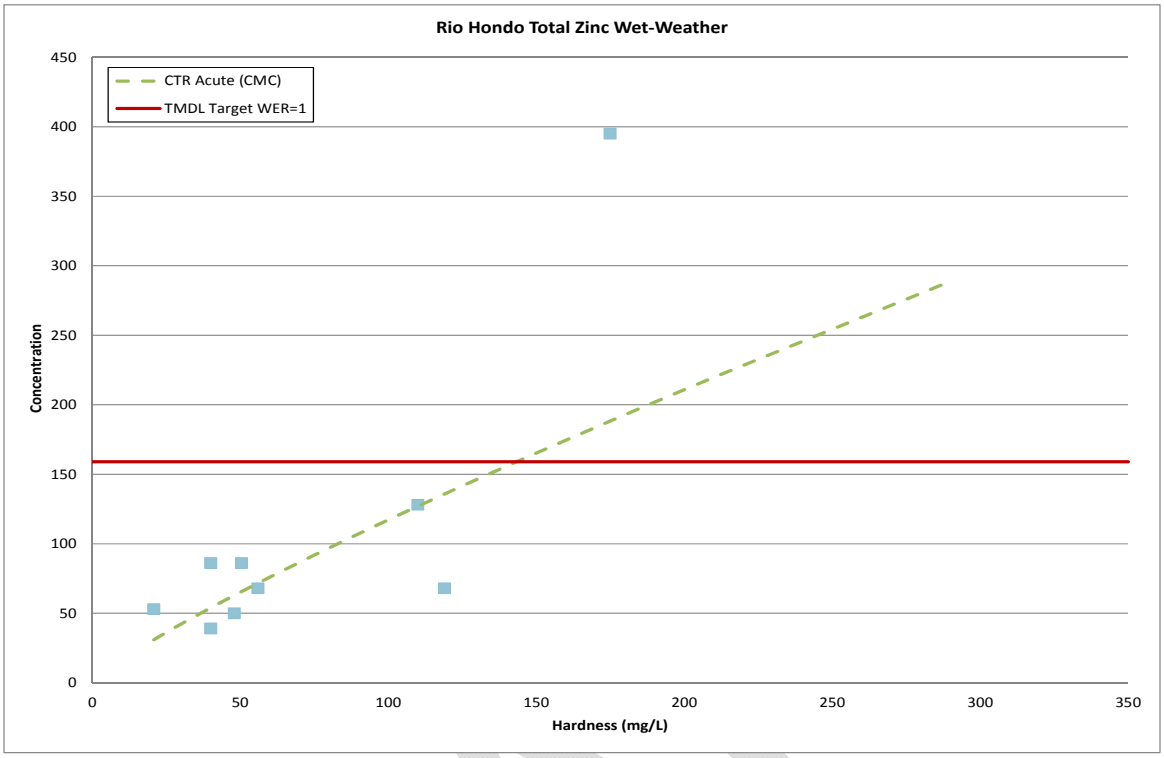


Figure D-11 Rio Hondo Total Zinc Concentrations Compared to Hardness Monitoring Plot from 2002-2012 Storm Seasons - Wet-Weather

Bacteria

Fecal and total coliforms concentrations, for sampling site LAR S10 and the Rio Hondo TS06, have been plotted against time in **Figure D-12** through **Figure D-15**. The Los Angeles River bacteria TMDL *E. coli* wet- and dry-weather effluent limitation daily maximum of 126 MPN/100 mL is shown on each figure. Although not directly comparable, during both dry- and wet-weather events, and for both the LAR S10 and Rio Hondo TS06, fecal and total coliform concentrations consistently did not meet the *E. coli* daily maximum.

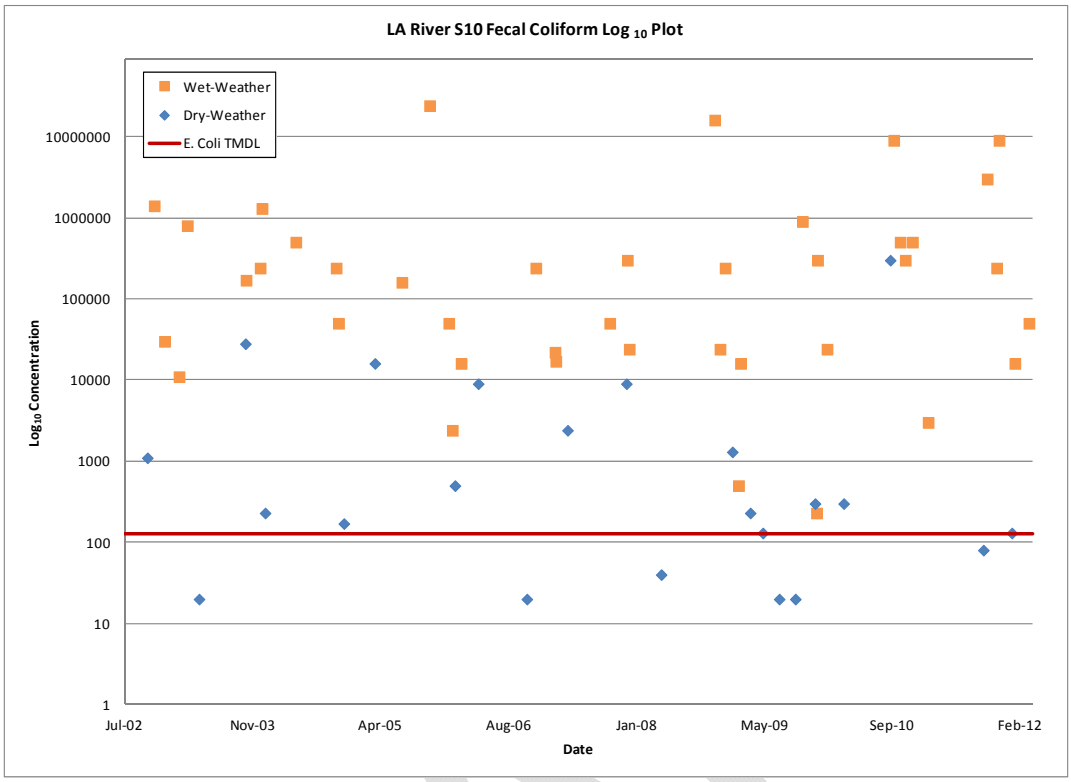


Figure D-12 LAR S10 Fecal Coliform Concentration Plot from 2002-2012 Storm Seasons

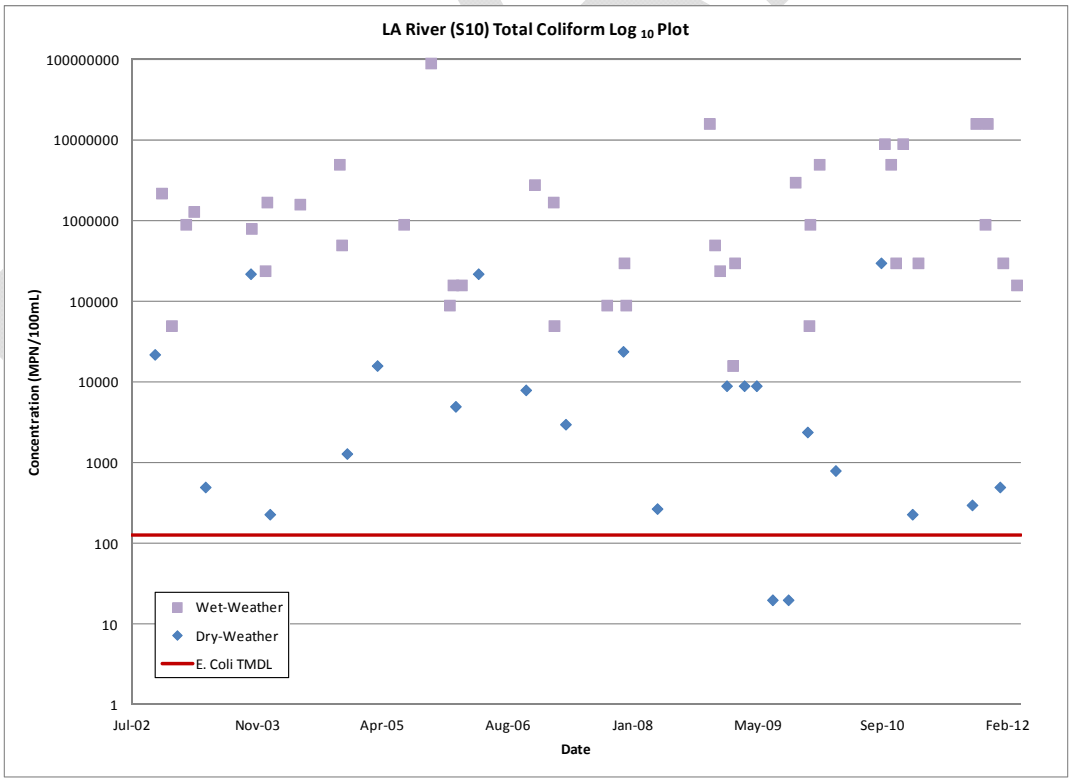


Figure D-13 Total Coliform Concentration Plot from 2002-2012 Storm Seasons

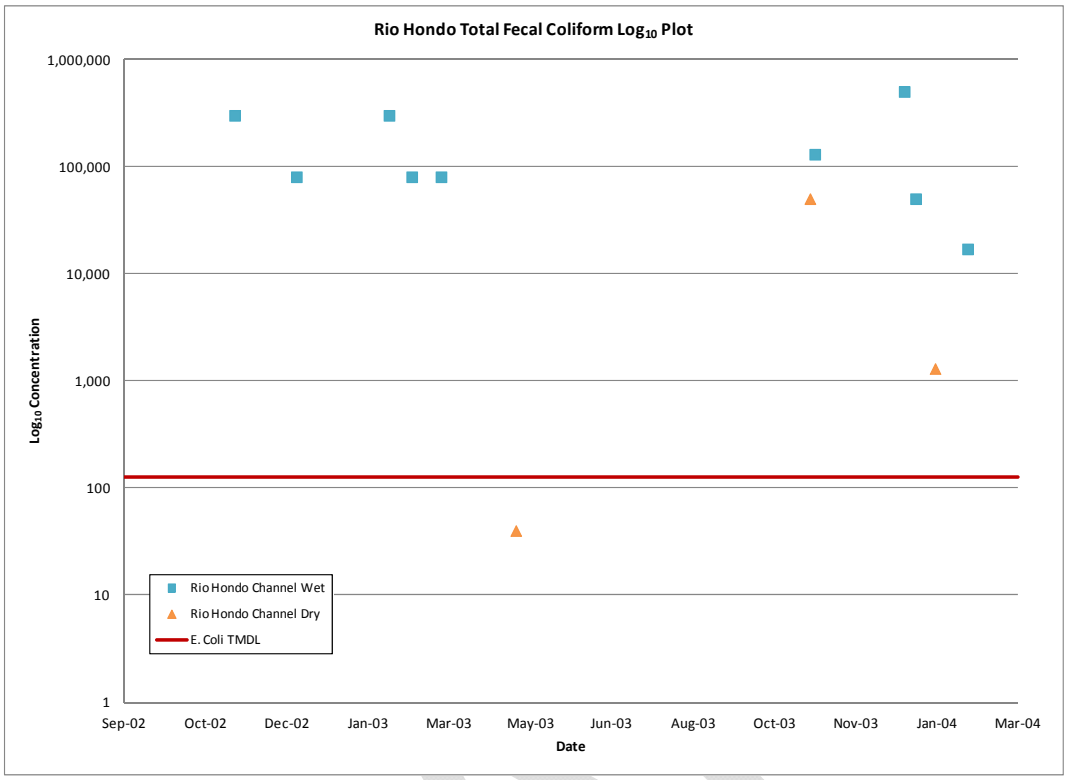


Figure D-14 Rio Hondo Fecal Coliform Concentration Plot form 2002-2012 Storm Seasons

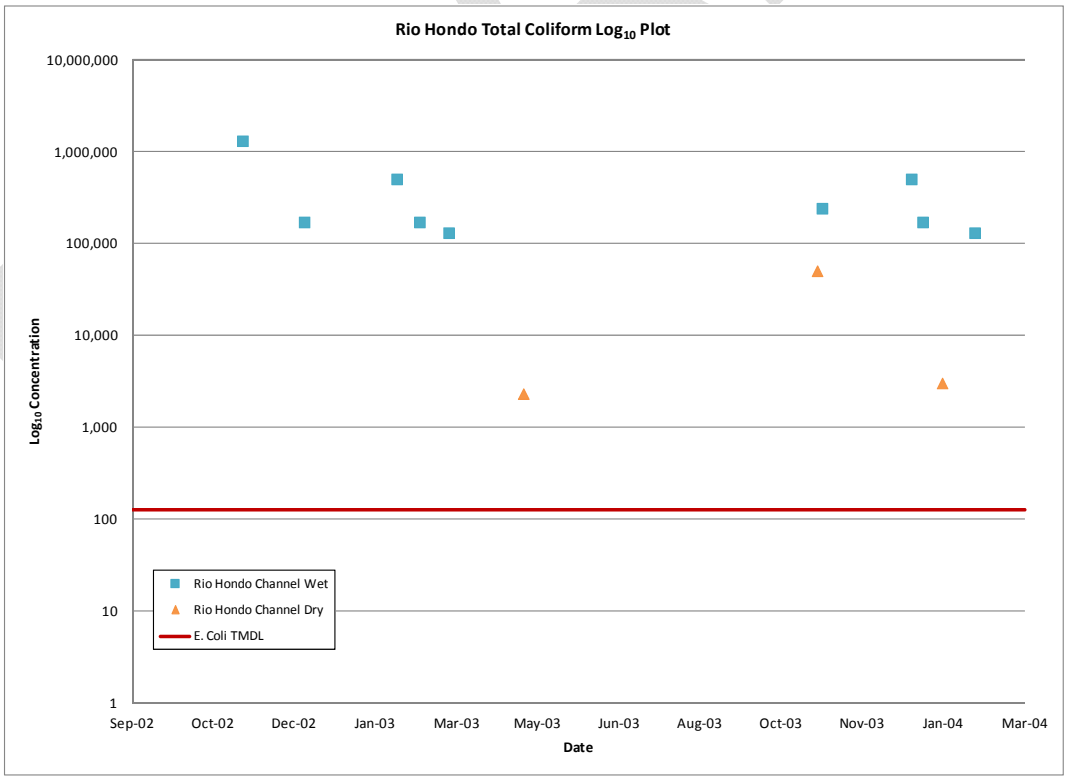


Figure D-15 Rio Hondo Total Coliform Concentration Plot from 2002-2012 Storm Seasons

Los Angeles River Metals TMDL CMP and Ambient Monitoring Submittal (2010-2011, 2011-2012)

At its July 17, 2006 meeting, the Los Angeles River Watershed Management Committee recommended formation of a Los Angeles River Metals TMDL Technical Committee (TC) and tasked the group with preparation of a Coordinated Monitoring Plan (CMP). The CMP includes both ambient (Tier I) and effectiveness monitoring (Tier II). The Tier I ambient monitoring program collects monthly samples at thirteen (13) locations shown in **Attachment 1, Figure 3**. Tier I monitoring site LAR1-8, LAR1-9, and LAR1-10 are located adjacent to the LAR UR2 WMA and the data from these sites would give the LAR UR2 WMA a better understanding of the distribution of metals concentrations in the adjacent WMAs.

Sampling results for CMP ambient monitoring for July 1, 2010 to June 30, 2011 (2010-2011) and July 1, 2011 through June 30, 2012 (2011-2012) was acquired. The 2011-2012 CMP results include submittal for both Ambient (Tier I) and Effectiveness (Tier II) Monitoring. Sampling sites LAR1-8, LAR1-9, and LAR1-10 were not sampled during wet-weather events. **Figure D-16** through **Figure D-19**, show that sampling sites LAR1-8 and LAR1-9 are in compliance of the LA Rivers metals TMDL daily maximums for Reach 2. However, sampling site LAR1-10, with a total of 10 sampling events, had a total of seven exceedances for total copper and three exceedances for total lead. LAR1-10 was compared to the metals TMDL daily maximum for the Rio Hondo.

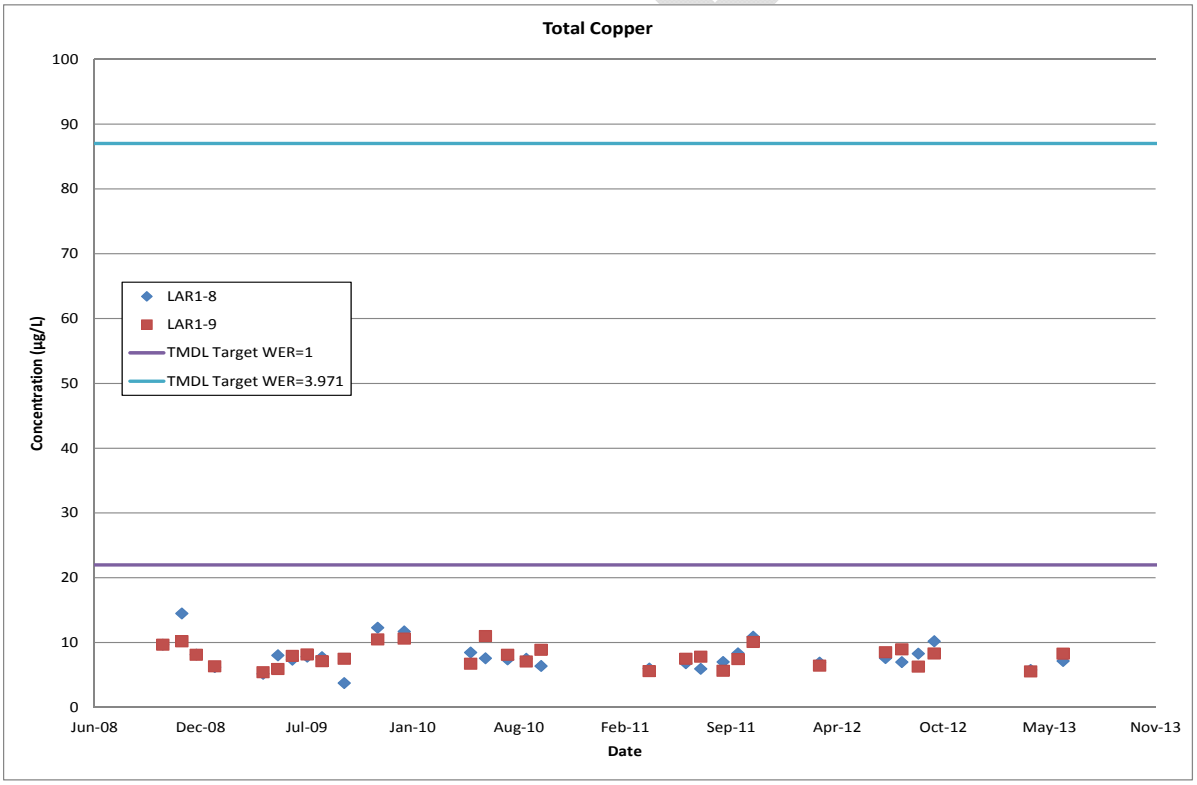


Figure D-16 Total Copper Concentration Comparison for LAR1-8 LAR1-9

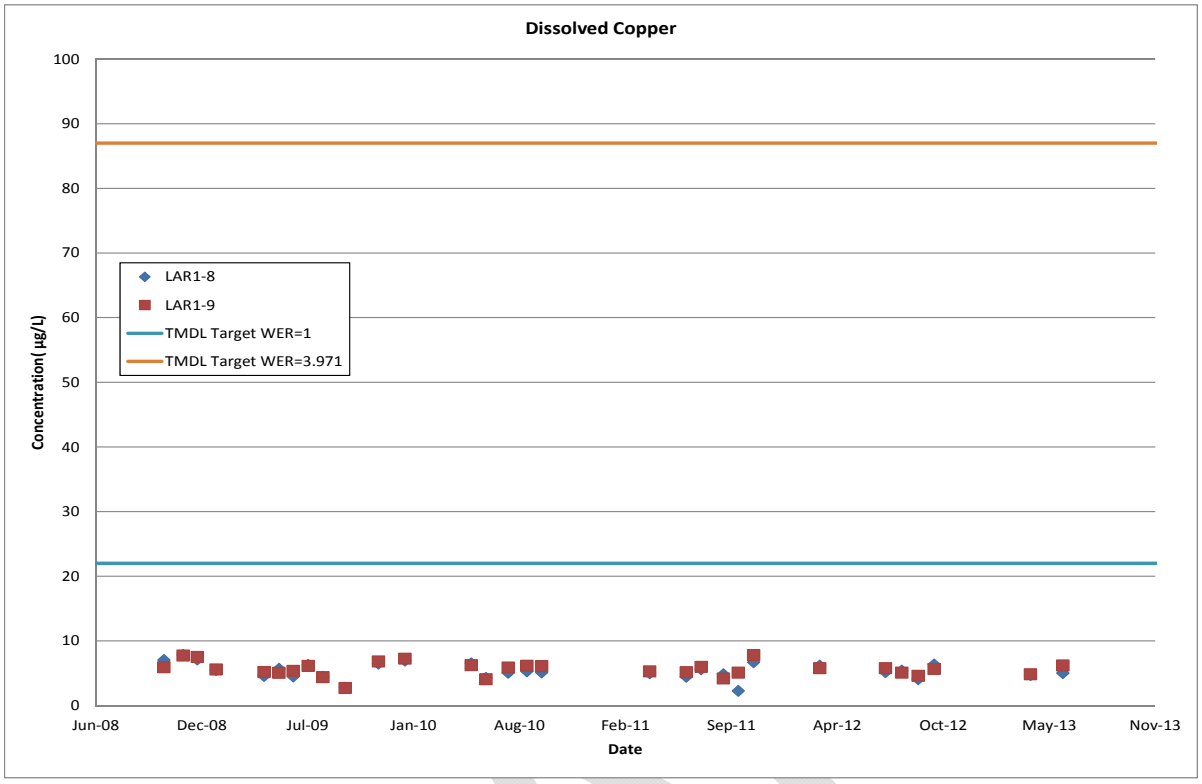


Figure D-17 Dissolved Copper Concentration Comparison for LAR1-8 LAR1-9

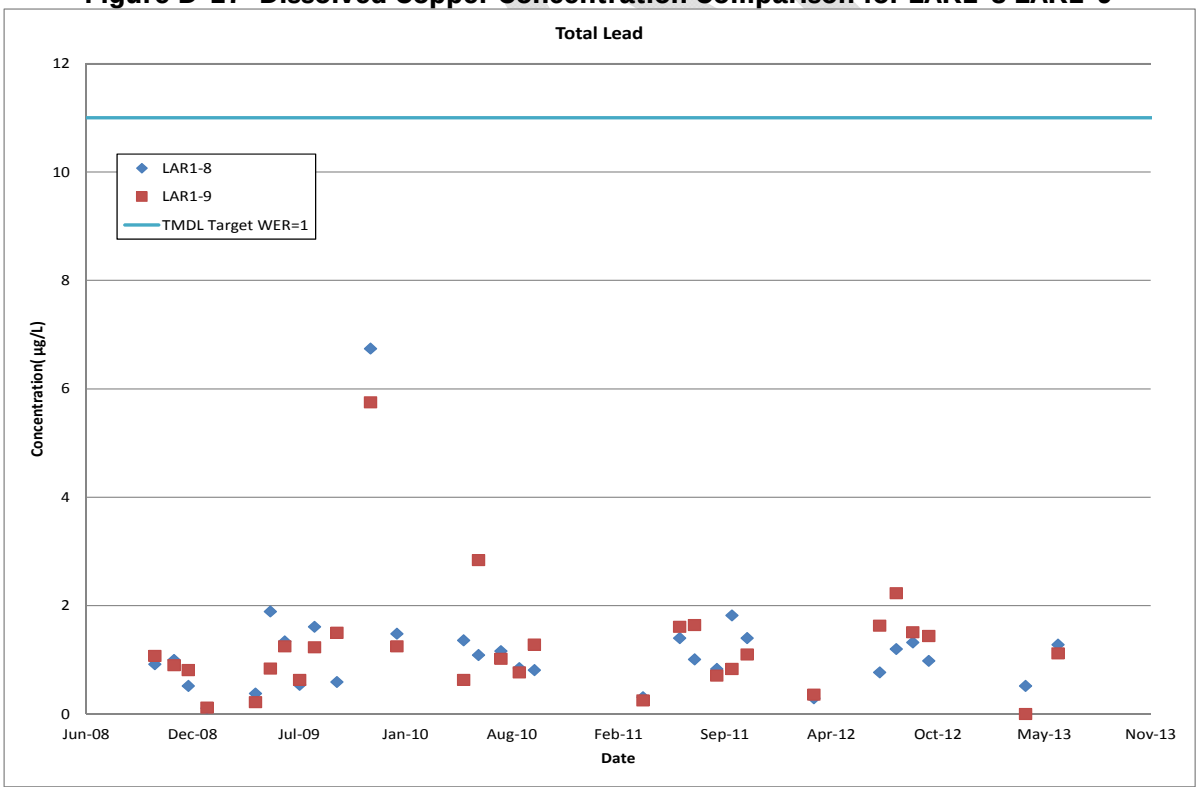


Figure D-18 Total Lead Concentration Comparison Plots for LAR1-8 and LAR1-9

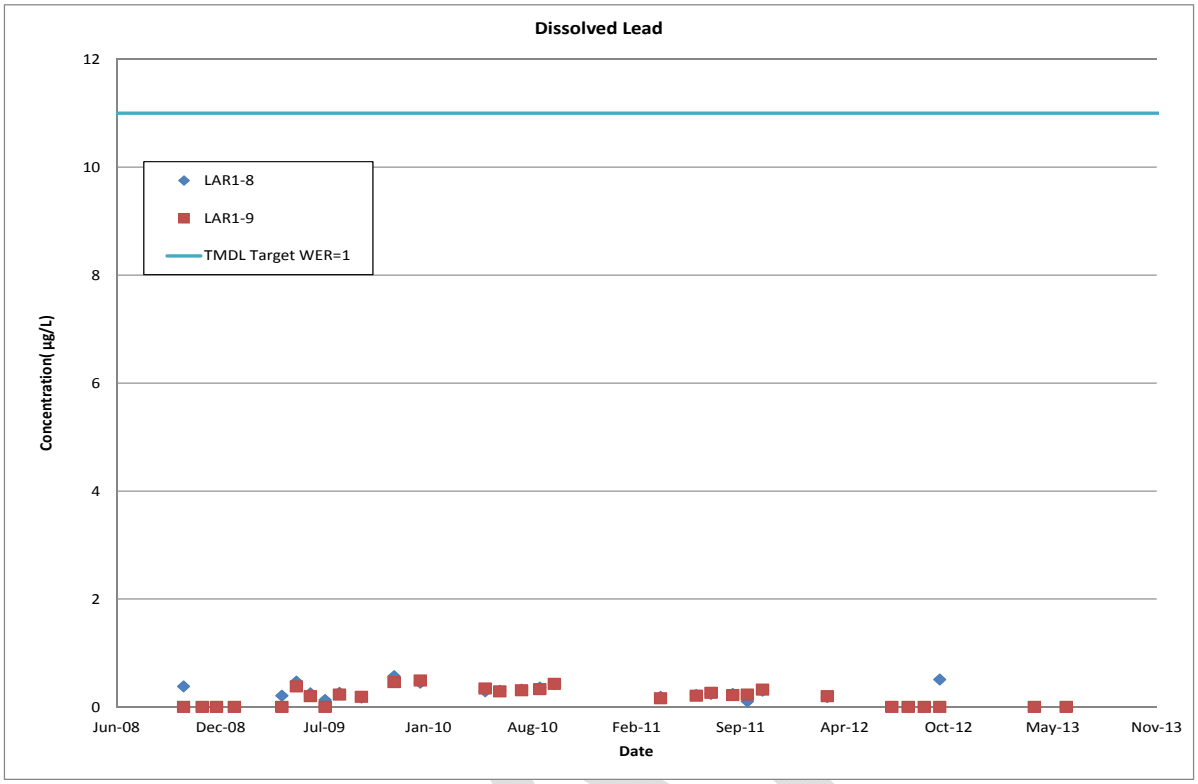


Figure D-19 Dissolved Lead Concentration Comparison Plots for LAR1-8 and LAR1-9

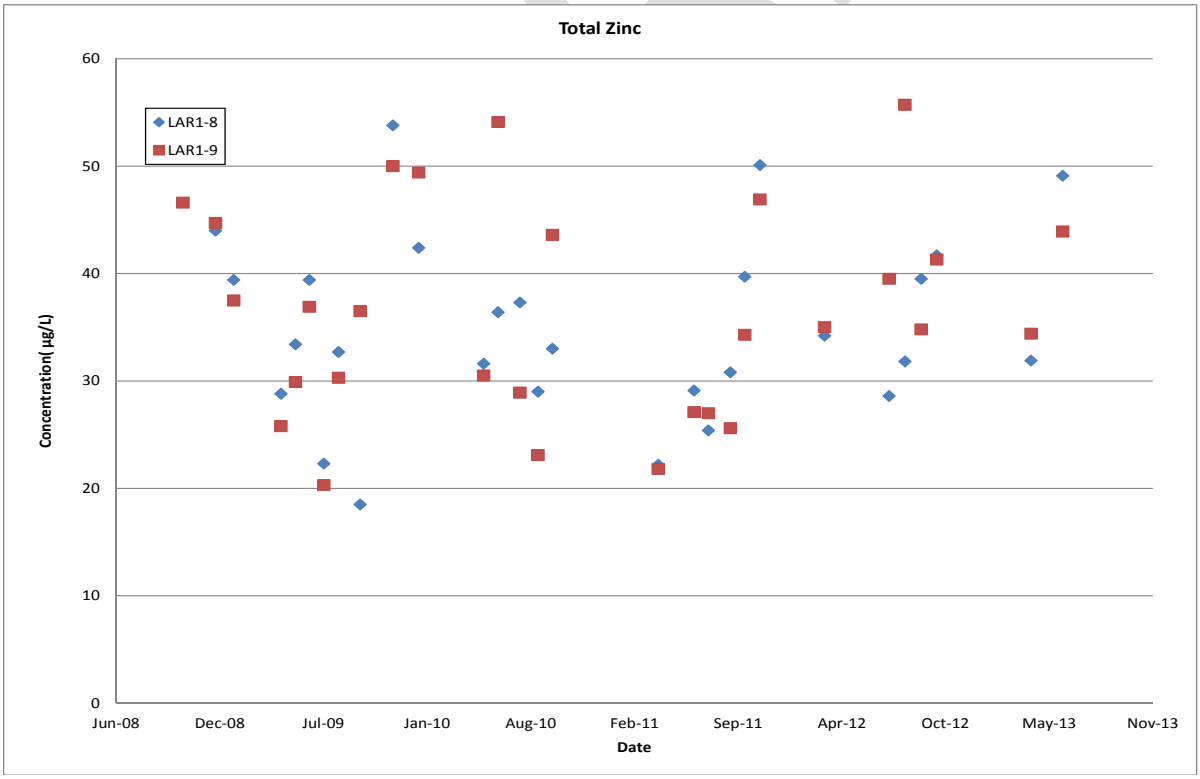


Figure D-20 Total Zinc Concentration Comparison Plots for LAR1-8 and LAR1-9

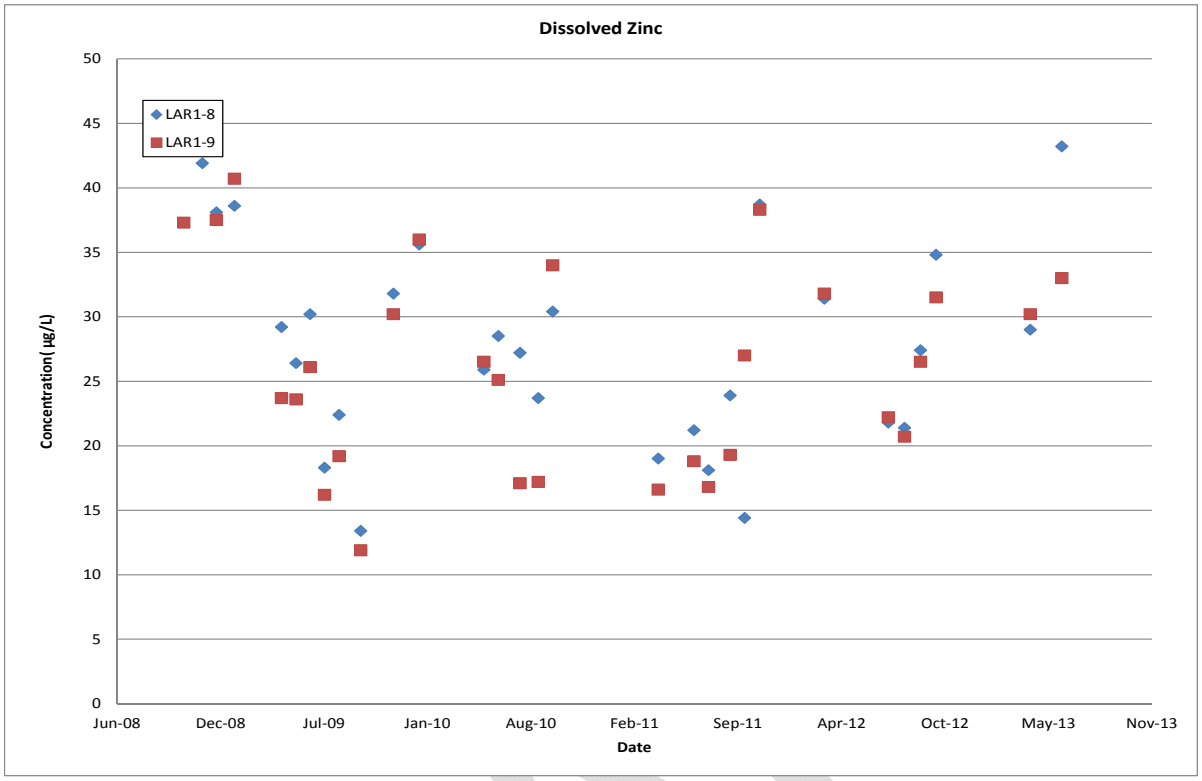


Figure D-21 Dissolved Zinc Concentration Comparison Plots for LAR1-8 and LAR1-9

Council for Watershed Health: Los Angeles River Watershed Monitoring

The Council for Watershed Health (CWH) coordinates the Los Angeles River Watershed Monitoring Program (LARWMP) to assess Watershed health based on five broad objectives: are stream conditions improving; are specific critical site conditions improving; do discharges meet WQOs; is it safe to swim; and are locally caught fish safe to eat. The CWH LARWMP collects water samples and performs bioassessments throughout the watershed using a stratified randomized sampling scheme that separates the watershed into natural, urban and mainstem portions from which random samples may be taken to facilitate comparisons. Sampling occurs annually, during the late spring or early summer, and the water is analyzed for general chemistry (nutrients), metals (total and dissolved), organophosphorus, and pyrethroid pesticides. The CWH provided for monitoring data from 2009 – 2012, which was reviewed for relevance. The most recent monitoring sites near the LAR UR2 WMA are LALT500, located at the LAR and Rio Hondo confluence, and LAR00830, which is located within Rio Hondo. As shown in **Attachment 1, Figure 4** both sites are located directly downstream of the LAR UR2 WMA. Although these sampling locations are not within the LAR UR2 WMA, the data provides perspective regarding water quality passing through the LAR UR2 WMA.

The CWH LARWMP found that one of four samples exceeded the MS4 Permit Total Kjeldahl Nitrogen (TKN) MAL of 4.59 mg/L. Based on the MS4 Permit MAL for Total Nitrate three exceedances, out of four samples, with a range of values from 2.02 to 5 mg/L were observed.

Site LALT500 observed one exceedance for total copper and two exceedances for total lead, among three samples. Sampling site LAR00830 had one exceedance for total copper from only one sample.

CREST Los Angeles River BSI Study Final Report

Consistent decreases in *E. coli* concentrations are observed where discharges of tertiary-treated, water reclamation plant (WRP) effluent overwhelm and dilute in stream flows. Generally single sample *E. coli* numbers at the base of reaches 2 and 4 are up to two orders of magnitude (100x) higher than water quality objectives (WQO). Identification of the sources responsible for these increases was a high priority of the BSI study, which was designed to characterize the bacteria inputs to the LA River, support the development of the Bacteria TMDL source assessment, and assist with prioritization of the types and locations of TMDL implementation actions. Bacteria concentrations in the LA River are typically at a minimum in reaches that are supplied with recycled water from municipal WRPs (Reach 4 - LAR @ Sepulveda Boulevard and Reach 2 - LAR @ Figueroa Street).

Monitoring for the BSI Study was conducted within LA River Reaches 2, 4, and 6, during a two-month period, when six "Snapshot" and six "WRP" events, consisting of more than 600 water samples, were collected for the BSI Study. Monitoring locations for Snapshot Events included 10 LA River sites, three tributary sites, and over 110 storm drain sites. **Attachment 1, Figure 5** shows the BSI Study WRP sampling locations while **Figure 6** and Figure 7 illustrate the storm drain sampling locations. The sampling logistics associated with the Snapshot Events were immense; each event was conducted over two days using four teams of field personnel. During WRP Events, untreated influent and tertiary-treated, disinfected effluent were collected from two WRPs: D.C. Tillman and City of LA-Glendale. All ~600 samples were analyzed for *E. coli*, *Enterococcus*, universal *Bacteroidales*, human-specific *Bacteroidales*, human adenovirus, flow rate, and seven other constituents. Along LAR R2 four receiving water sites were sampled and approximately 47 storm drain discharge sites were sampled, regularly or irregularly.

Therefore it appears that significant loads of bacteria are entering the water column in Reach 2, leading to concentration increases and WQO exceedances.

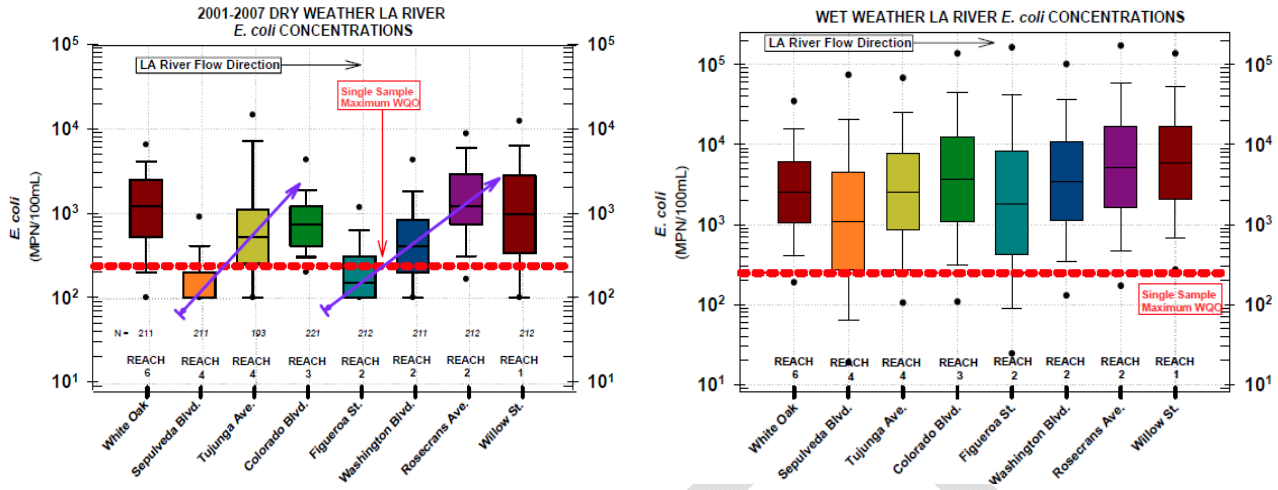


Figure D-22 Mainstem LA River E. coli Concentrations as Measured during Dry and Wet Weather by Status and Trends from 2001-2007

Status and Trends monitoring dataset collected from wet-weather shows that bacteria concentrations are about one order of magnitude higher during dry-weather, and there is less apparent spatial variation, as shown in **Figure D-23**. Median bacteria concentrations are well above the single sample maximum WQOs at all sites during wet-weather. Although the trend is not as strong as with dry-weather sampling, there is still a slight upward trend in the median concentrations in the downstream direction in both Reaches 2 and 4 during wet-weather. This may be an indication that the same source(s) may be influencing bacteria levels during both dry- and wet-weather. Overall, the relatively uniform spatial patterns suggest that strong, ubiquitous inputs of bacteria affect the LA River during wet-weather. Studies in other southern California watersheds have observed similarly strong and ubiquitous wet-weather bacteria sources, with > 99% of the annual bacteria loading from watersheds occurring during storm events.

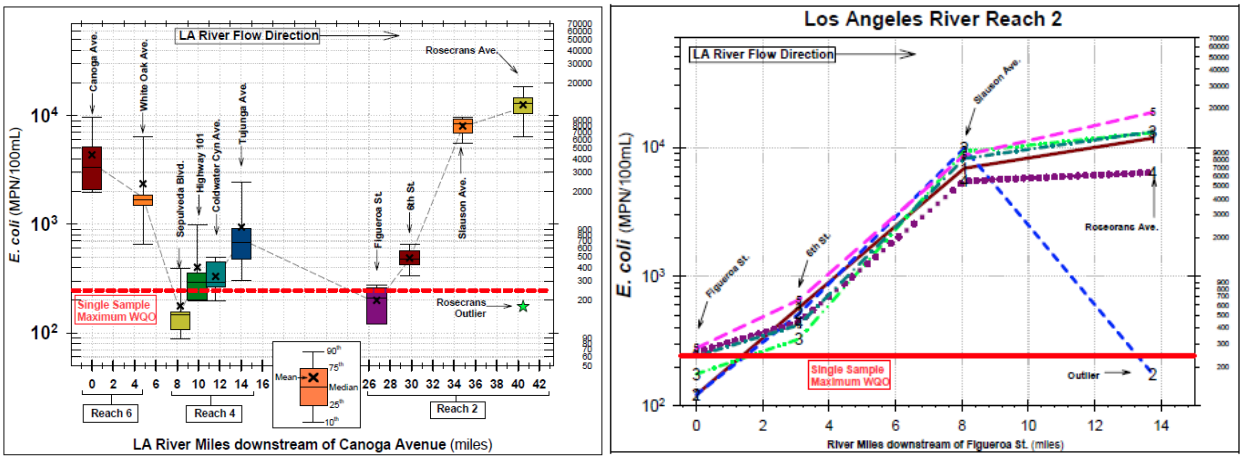


Figure D-23 Measured *E. coli* Concentration along the LA River - BSI Monitoring Study

E. coli

Along Reach 2, both *E. coli* concentrations and loading rates increased from upstream to downstream on each sampling date. The measured concentration and loading rate always increased from Figueroa Street to 6th Street to Slauson Avenue to Rosecrans Avenue. Respectively, the average concentrations

along Reach 2, from upstream to downstream, were 199, 488, 8030, and 10,522 MPN/100mL, and average loading rates were 415, 1,030, 18,642, and 27,174 x109 MPN/day. Overall, *E. coli* concentrations increased by approximately two orders of magnitude (100x) between the upstream and downstream ends of Reach 2. As such, apparently strong sources of *E. coli* are significantly affecting Reach 2, primarily along the lower section between 6th Street and Rosecrans Avenue. This large upstream-downstream increase, which was one of the motivations behind the BSI Study, was also apparent during other studies of Reach 2, including the Status and Trends monitoring.

Enterococcus

Along Reach 2, *Enterococcus* concentrations generally increased from upstream to downstream with average concentrations of 59, 299, 399, and 556 MPN/100mL at Figueroa Street, 6th Street, Slauson Avenue, and Rosecrans Avenue, respectively. However, the concentration differences among lower and upper Reach 2 sites for *Enterococcus* were not nearly as dramatic as for *E. coli*, with an approximately order of magnitude (10x) increase in *Enterococcus* concentration from Figueroa Street to Rosecrans Avenue, compared to two orders of magnitude increases (100x) for *E. coli*. Concentrations of *Enterococcus* were generally more variable when compared to *E. coli*, particularly at 6th Street (coefficient of variation [CV] of 0.24 for *E. coli* compared to 1.61 for *Enterococcus*) and Slauson Avenue (CV of 0.20 for *E. coli* compared to 0.95 for *Enterococcus*). The only statistically significant difference among Reach 2 sites was for Rosecrans Avenue versus Figueroa Street; the mean log *Enterococcus* concentrations and loading rates were significantly higher at Rosecrans Avenue (HSD test, α=0.05).

Bacteroidales

Along Reach 2, universal and human *Bacteroidales* concentrations apparently increased between Figueroa Street and 6th Street and then remained relatively constant between 6th Street and Rosecrans Avenue. All-event average concentrations slightly increased from 28 gc/mL to 32 gc/mL and the rate of detection indicate a source of human fecal inputs affecting LA River concentrations along this segment; human *Bacteroidales* was detected on 3 of 6 dates at Figueroa Street and 6 of 6 events at 6th Street. Average concentrations of universal *Bacteroidales* also increased from 2,282 to 3,973 gc/mL between Figueroa Street and 6th Street. *E. coli* concentrations increased along this segment, from generally in-compliance with WQOs at Figueroa Street to out-of-compliance at 6th Street. It is interesting to note that a majority of the homeless person activity observed along Reach 2 during the BSI Study was near the 6th Street bridge, where there were numerous encampments near storm drain outfalls. One of the most significant storm drain inputs of human *Bacteroidales* (storm drain site R2-A) was between these sites as well.

Further downstream, universal and human *Bacteroidales* concentrations remained relatively constant or decreased. Average human *Bacteroidales* concentrations at Slauson Avenue and Rosecrans Avenue were 75 gc/mL and 47 gc/mL, respectively. Average universal *Bacteroidales* concentrations at Slauson Avenue and Rosecrans Avenue were 4,668 gc/mL and 4,650 gc/mL, respectively. During 5 of 6 events and 3 of 6 events, respectively, universal and human *Bacteroidales* concentrations decreased between Slauson Avenue and Rosecrans Avenue. There were no significant differences among Reach 2 sites for universal or human *Bacteroidales*. *E. coli* concentrations increased dramatically along this segment. Thus, it appears that the apparent bacteria source(s) affecting lower Reach 2 are predominantly non-human, highly abundant in *E. coli*, and low in *Bacteroidales*.

Tributary Measurements

Three tributaries were monitored during this study; Arroyo Seco and Rio Hondo along Reach 2 and Tujunga Wash along Reach 4. Concentrations of *E. coli* in tributaries were generally above the WQO of 235 MPN/100mL. Rio Hondo was the only tributary that exhibited concentrations below the WQO 2 of 6 samples were <235 MPN/100mL, one of these was non-detect. However, the maximum tributary

E. coli (48,840 MPN/100mL) concentration was also measured at Rio Hondo, making it the tributary with the most variable *E. coli* concentrations and loading rates.

Concentrations of *Enterococcus* in tributaries ranged from 74 to 10,462 MPN/100mL and loading rates ranged from 0.09 to 584 x109 MPN/day. Compared to *E. coli*, the variability of *Enterococcus* in Arroyo Seco was greater, but lower for Rio Hondo. Median concentrations, from high to low, were Tujunga Wash > Arroyo Seco > Rio Hondo.

Concentrations of universal *Bacteroidales* ranged from 244 to 16,800 gc/mL while human *Bacteroidales* ranged from non-detect to 6150 gc/mL. The variability of universal *Bacteroidales* in tributaries was generally lower than *E. coli or Enterococcus*, and human *Bacteroidales* were detected in 10 of 18 samples. The Rio Hondo exhibited the highest median universal *Bacteroidales* and lowest median human *Bacteroidales* concentration, indicating non-human sources. Loading of human *Bacteroidales* in the Rio Hondo was two orders of magnitude lower than the Tujunga Wash and Arroyo Seco. For both 200-mL and 4-liter methodologies, human viruses were detected in 0 of 18 tributary samples.

Attachment 1

Additional Figures

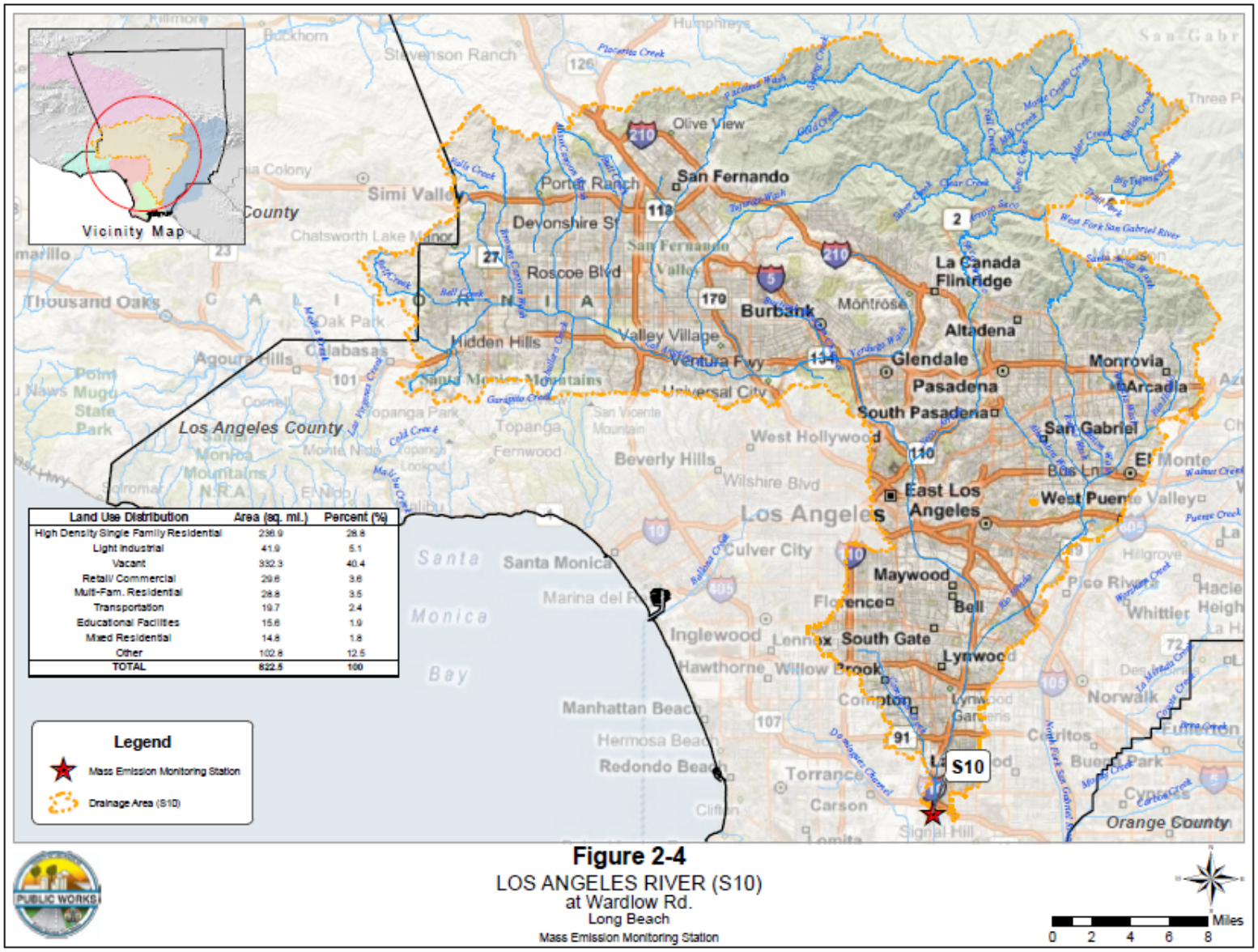


Figure 1 LA County Annual Stormwater Monitoring Reports (2002-2012) - LA River S10 Locations

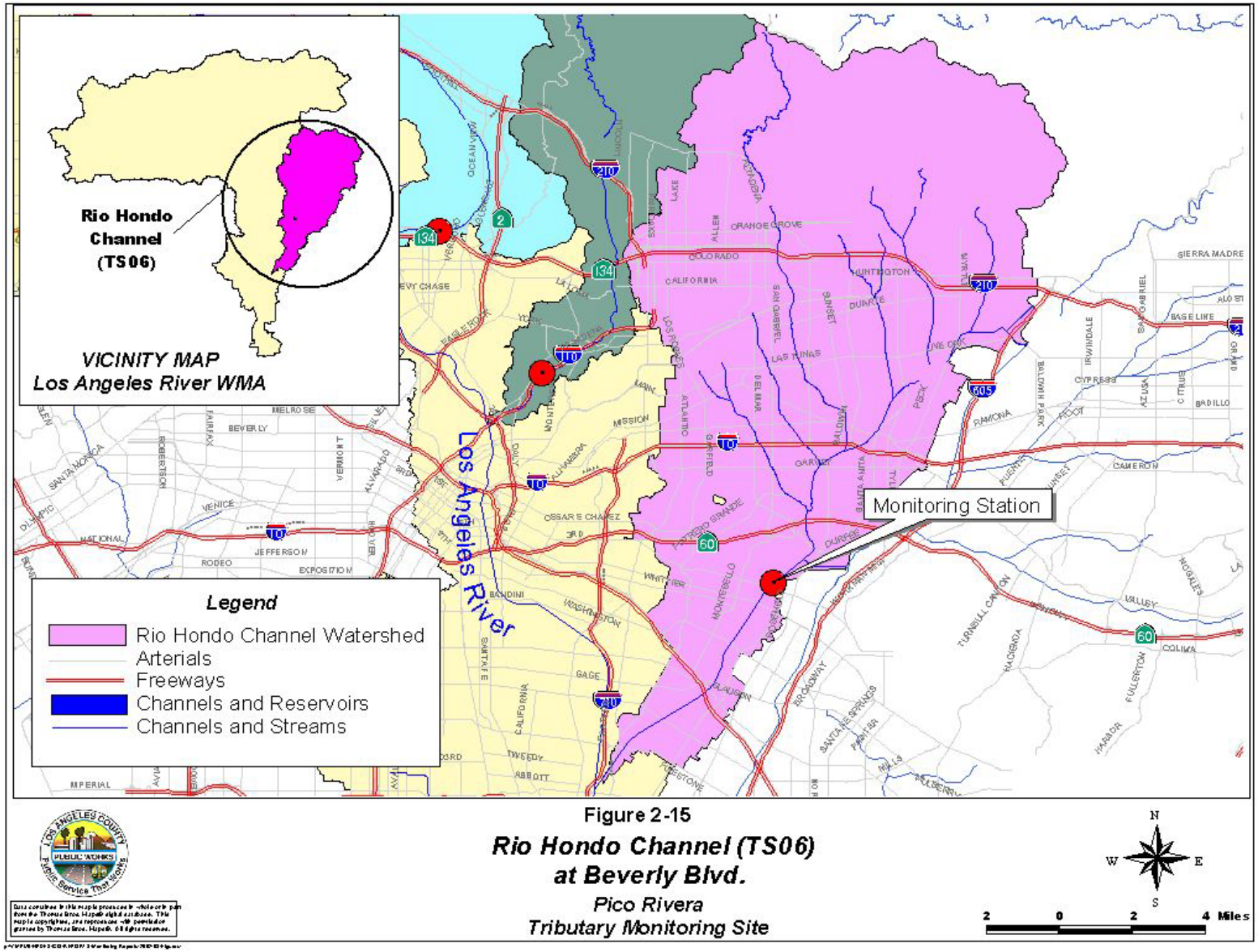


Figure 2 LA County Annual Stormwater Monitoring Reports (2002-2012) - Rio Hondo TS06 Location

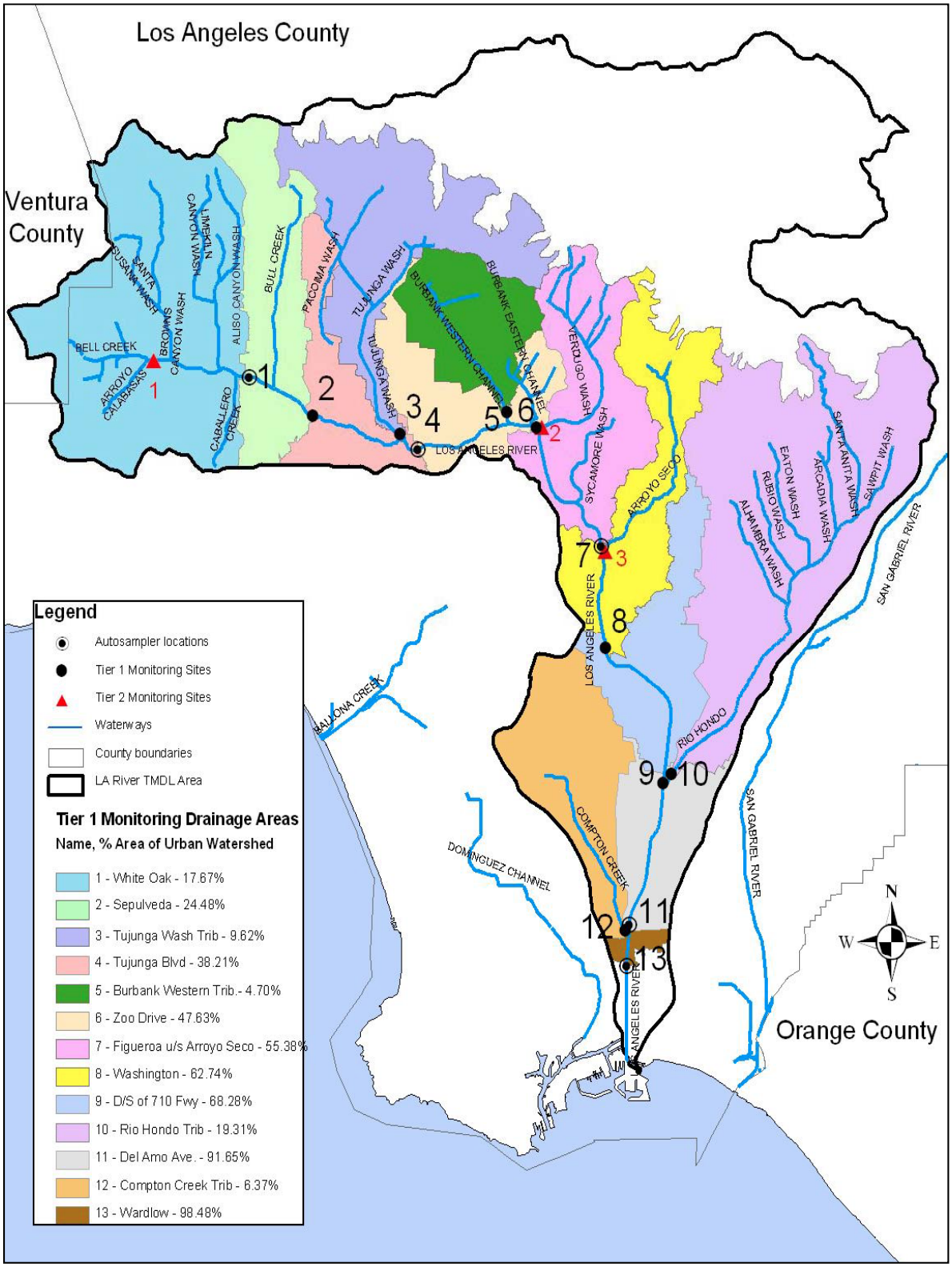


Figure 3 LA River Metals TMDL Coordinated Monitoring Plan Tier I and II Monitoring Locations

Figure 4 CWH Los Angeles River Watershed Monitoring Program (2011 Draft Report) LARWMP Sampling Locations 2011

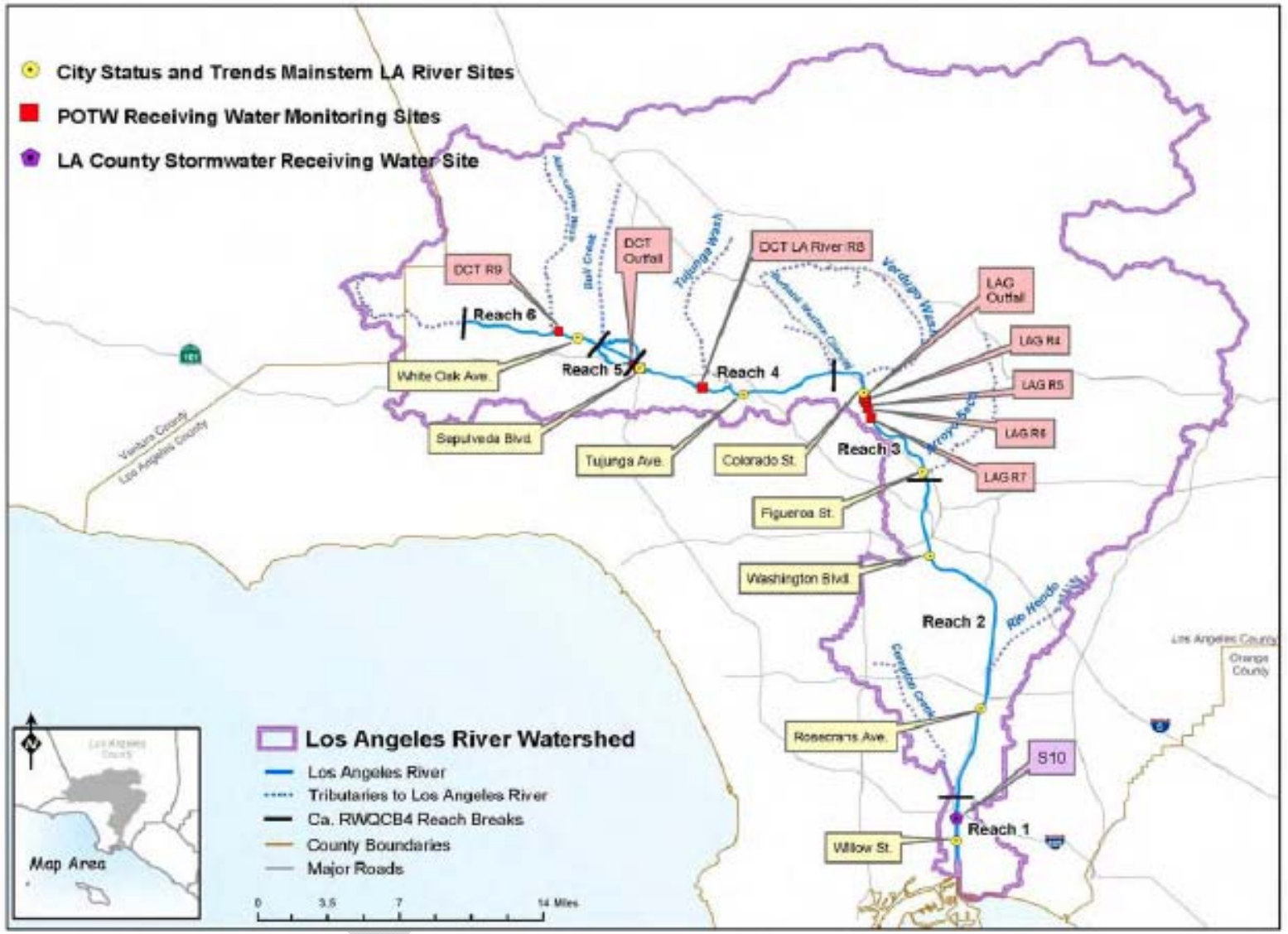


Figure 5 Crest LA River Bacteria Source Identification (BSI) Study Final Report - LA River Reaches and Long-Term Bacteria Monitoring Locations along the Mainstream LA River

Figure 6 Crest LA River Bacteria Source Identification (BSI) Study Final Report - BSI Study Monitoring Locations

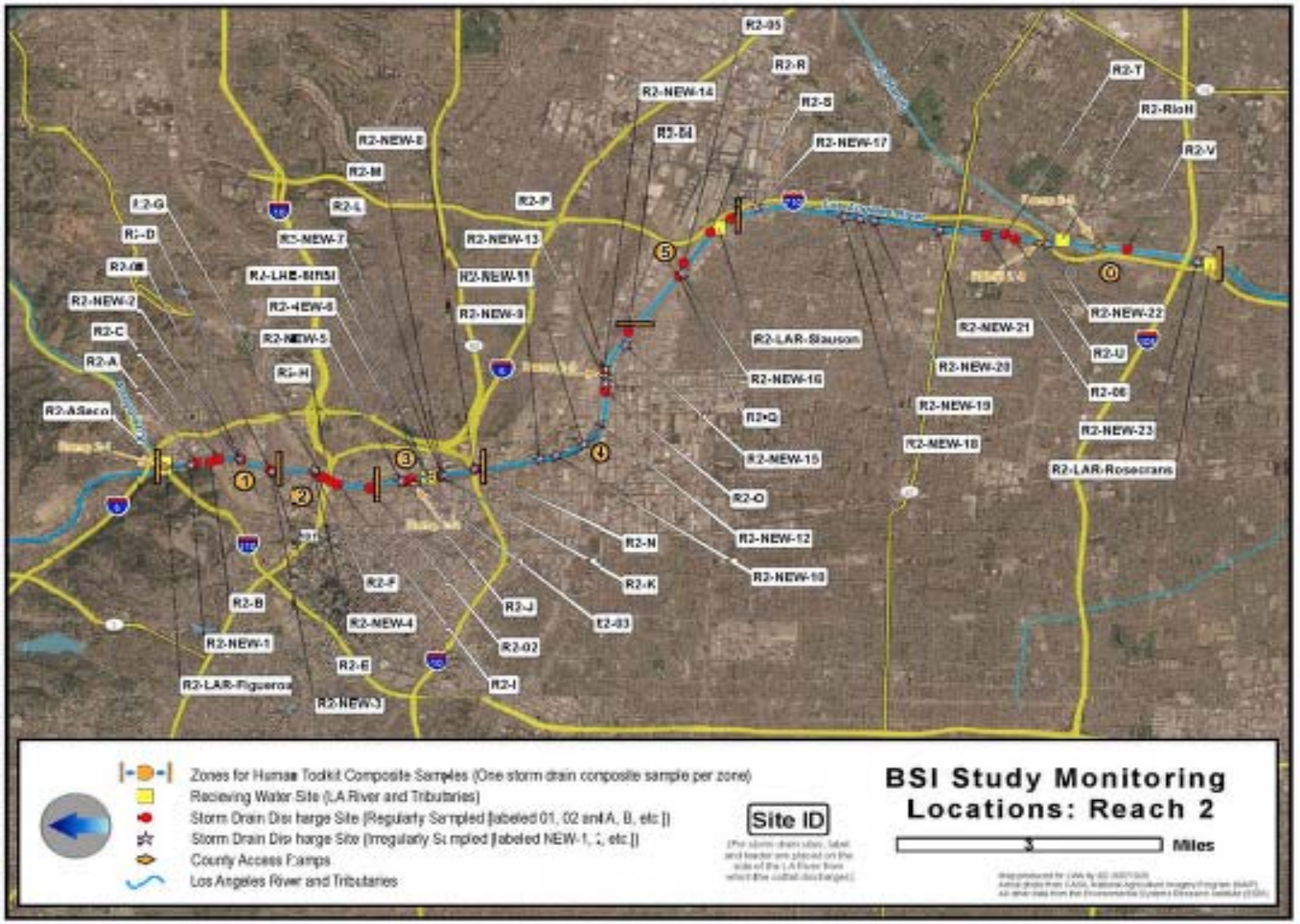


Figure 7 Crest LA River Bacteria Source Identification (BSI) Study Final Report - BSI Study Monitoring Locations: Reach 2

Appendix E

Summary of Existing MCMs/Institutional BMPs Implemented by LAR UR2 WMA

Table E-1 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2010-2011									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
General Permit Requirements									
Prohibit non-stormwater discharges into the MS4 and watercourses	1	Feb-02	I	I	I		I	D	I
Comply with Receiving Water Limitations (RWL) requirements	2	Feb-02	I	I	I		I	I	I
Implement the Stormwater Quality Management Plan (SQMP)	3.A.1	Feb-02	I	I	I		I	I	I
Revise the SQMP	3.A.4	Aug-02	I	I	I		I	NA	I
Implement the most effective combination of BMPs for storm water/ urban runoff pollution	3.B	Feb-02	I	I	I		I	I	I
Prepare and submit Annual Budget Summary as part of the annual report to the RWQCB	3.E.5	Oct-02	I	I	I		I	I	I
Conduct quarterly watershed management committee meetings	3.F.3.g	Mar-02	I	NA	I		I	I	NA
Amend and adopt county ordinance to enforce all requirements of the permit, if needed	3.G.3	Nov-02	I	I	I		I	I	I
Submit to RWQCB a legal statement demonstrating the necessary legal authority	3.G.4	Dec-02	I	I	I		I	I	I
Prepare and submit to the RQWCB individual annual reports	1.B	Aug-02	I	I	I		NA	I	I
Special Provisions									
Public Information and Participation - Permit Requirements									
Implement public information and participation program	4.B	Feb-02	I	NA	I		I	I	I
Convene an Advisory Committee	4.B	ASAP	NA	NA	I		NA	NA	NA
Mark all storm drain inlets with a "no dumping" message	4.B.1.a	Feb-04	I	I	I		I	I	I
Maintain the (888) CLEAN-LA hotline	4.B.1.b	Feb-02	I	NA	I		I	NA	NA
Provide a list of reporting contacts to public through www.888CleanLA.com	4.B.1.b	Mar-02	I	NA	I		I	I	I
Media campaign for Storm Water Pollution Prevention (SPP)	4.B.1.c.1	Feb-02	I	I	I		I	I	I
Strategy to educate ethnic communities about SPP	4.B.1.c.2	Feb-03	NA	I	I		I	I	NA
Enhance outreach for proper disposal of cigarette butts	4.B.1.c.3	Feb-02	I	I	I		NA	I	NA
Conduct educational activities within jurisdiction and participate in county-wide events	4.B.1.c.4	Feb-02	I	I	I		I	I	I

Table E-1 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2010-2011									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
Organize Public Outreach Strategy meetings quarterly	4.B.1.c.5	May-02	I	NA	I		I	I	NA
Conduct Media Outreach to 35 million impressions per year	4.B.1.c.6	Annually	NA	NA	I		I	D	NA
Distribute SPP information to K-12 schools	4.B.1.c.7	-	I	I	I		I	I	I
Coordinate and provide contact information for public education activities	4.B.1.c.8	Apr-02	I	I	I		I	I	I
Strategy to measure effectiveness of in-school programs	4.B.c.9	May-02	NA	I	I		NA	NA	NA
Behavioral change assessment strategy towards SPP	4.B.c.10	May-02	NA	I	I		NA	NA	NA
Coordinate watershed-specific pollution prevention outreach programs	4.B.1.d	Feb-03	I	NA	I		I	I	I
Corporate Outreach Program to target retail gas outlets and restaurant chains	4.B.2.a	Feb-03	I	NA	I		I	I	NA
Coordinate an SPP program for a Business Assistance Program	4.B.2.b	Optional	NA	I	I		NA	NA	I
Industrial/Commercial Facilities Control - Permit Requirements									
Maintain a list of industrial/commercial facilities to be inspected	4.C.1	Aug-02	I	I	I		I	D	I
Inspect/visit industrial/commercial facilities appropriately	4.C.2	Aug-04	I	I	I		I	NA	I
Initiate progressive enforcement for facilities failing to implement BMP's	4.C.3	-	I	I	I		I	NA	I
Inspect restaurants twice during Permit cycle	4.C.2	Aug-04	I	I	I		I	I	I
Development Planning - Permit Requirements									
Implement development planning program that requires SUSMP	4.D	Feb-02	I	I	I		I	I	I
Develop peak flow control criteria	4.D.1	Feb-05	I	D	D		I	NA	I
Amend codes and ordinances to give legal effect to SUSMP changes in permit	4.D.2.a	Aug-02	I	I	I		I	I	I
Implement revised SUSMP	4.D.2.b	Sep-02	I	I	I		I	I	I
Submit an Environmentally Sensitive Areas (ESAs) Delineation map to RWQCB	4.D.2.d	Jun-02	NA	NA	NA		NA	NA	I
Implement SUSMP requirements for industrial/commercial projects >1 acre	4.D.5	Mar-03	I	I	I		I	I	I
Update CEQA guidelines to include specific storm water related issues	4.D.11	Feb-02	NA	I	I		NA	I	I

Table E-1 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2010-2011									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
Update General Plan to include specific storm water related issues	4.D.12	-	I	I	I		NA	**	I
Train targeted employees in permit requirements for Development Planning	4.D.13	Varies	I	I	I		I	NA	I
Develop and make SUSMP guidelines available to the developer	4.D.14.a	Feb-02	I	D	D		I	D	I
Develop a technical manual for the siting and design of BMPs	4.D.14.b	Feb-04	I	D	D		I	NA	I
Development Construction - Permit Requirements									
Implement a development construction program	4.E.1 &2	Feb-02	I	I	I		I	I	I
Require proof of a Waste Discharger ID (WDID) number prior to filing Notice of Intent (NOI)	4.E.2.c	Mar-03	I	I	I		I	I	I
Require proof of an NOI and a copy of SWPPP for a transfer of ownership	4.E.3	Feb-02	I	I	I		NA	D	I
Track the number of issued building and grading permits	4.E.3.c	Feb-02	I	I	I		I	I	I
Refer General Construction Activities Stormwater Permit (GCASP) violations to RWQCB	4.E.4	Feb-02	I	I	I		I	I	I
Train targeted employees in permit requirements for Development Construction	4.E.5	Varies	I	I	I		I	NA	I
Public Agency Activities - Permit Requirements									
Implement a sewer overflow prevention and response program	4.F.1	Aug-02	NA	I	I		I	I	I
Implement Development Planning Program at Permittee-owned construction projects	4.F.2.a	Aug-02	I	I	I		I	I	I
Implement Development Construction Program at Permittee-owned construction projects	4.F.2.b	Feb-02	I	I	I		I	I	I
Develop, if needed, and implement SWPPPs for field facilities	4.F.3	Feb-02	NA	I	D		NA	NA	I
Equip wash areas with a clarifier, pre-treatment device, or be connected to sewer	4.F.3.c	Feb-02	NA	I	I		NA	NA	I
Store pesticides/herbicides/fertilizers indoors and apply only in accordance	4.F.4.c&g	Feb-02	NA	I	I		NA	NA	I
Designate Catch Basins as priority A, B, or C	4.F.5.a	Feb-02	I	I	I		I	I	I
Ensure that Catch Basins (CBs) are cleaned appropriately	4.F.5.c.1	Feb-02	I	I	I		I	NA	I
Place temporary screens on CBs prior to special events or cleanout immediately afterwards	4.F.5.c.2	Feb-02	I	I	I		I	NA	I
Place and maintain trash receptacles at all transit stops with shelters	4.F.5.c.3	Feb-02	I	I	I		I	I	I

Table E-1 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2010-2011									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
Inspect the legibility of CB stencils and re-label within 180 days if necessary	4.F.5.d	-	I	I	I		I	I	I
Visually monitor and clean all open channels annually for debris	4.F.5.e.1	Feb-02	NA	I	I		NA	NA	NA
Designate curbed streets as priority A, B, or C based on liter accumulation	4.F.6.a.b	Feb-02	I	I	I		I	I	I
Recover saw cutting waste and dispose it offsite	4.F.6.c	Feb-02	I	I	I		I	I	I
Train targeted employees in permit requirements for Public Agency Activities	4.F.6.d	Varies	I	I	I		I	NA	I
Inspect and, if needed, clean Permittee owned parking lots twice per month, but at least once	4.F.7	Feb-02	I	I	I		I	NA	I
Conduct a dry weather diversion study and create a priority list of drains for diversion	4.F.10	Jul-03	NA	I	D		**	I	I
Illicit Connections / Illicit Discharges - Permit Requirements									
Develop an Implementation Program which specifies how revisions of the IC/ID SQMP are implemented	4.G.1.a	-	I	D	D		I	I	I
Create a database for permitted storm drain connections and map IC/ID	4.G.1.b	Feb-03	I	I	I		NA	NA	I
Perform IC/ID Trend Analysis	4.G.1.b	Feb-03	NA	I	I		**	NA	I
Train targeted employees in the permit requirements for IC/ID	4.G.1.c	Varies	I	I	I		I	NA	I
Field screen the storm drain system for illicit connections in open channels	4.G.2.a	Feb-03	NA	I	D		NA	NA	NA
Field screen the storm drain system for illicit connections in underground storm drains in priority areas	4.G.2.a	Feb-05	I	I	D		I	NA	I
Field screen the storm drain system for illicit connections in underground s/d larger than 36 inch diameter	4.G.2.a	Dec-06	I	I	D		I	NA	I
Review all permitted connections to the storm drain system for compliance	4.G.2.a	Dec-06	NA	NA	I		NA	NA	I
Investigate illicit connections 21 days after discovery	4.G.2.b	-	I	I	I		I	I	I
Terminate illicit connections 180 days after confirmation	4.G.2.b	-	I	I	I		I	I	I
Respond to illicit discharges within one business day of discovery	4.G.3.a	-	I	I	I		I	I	I
Investigate illicit discharges as soon as practicable	4.G.3.a	-	I	I	I		I	I	I

Table E-1 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2010-2011									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**

NA - Not Applicable or Not Completed
D - Developed
I - Program Implemented/Completed
** - Not Scheduled

Table E-2 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2011-2012									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
General Permit Requirements									
Prohibit non-stormwater discharges into the MS4 and watercourses	1	Feb-02		I	I			I	I
Comply with Receiving Water Limitations (RWL) requirements	2	Feb-02		I	I			I	I
Implement the Stormwater Quality Management Plan (SQMP)	3.A.1	Feb-02		I	I			I	I
Revise the SQMP	3.A.4	Aug-02		I	I			**	I
Implement the most effective combination of BMPs for storm water/ urban runoff pollution	3.B	Feb-02		I	I			I	I
Prepare and submit Annual Budget Summary as part of the annual report to the RWQCB	3.E.5	Oct-02		I	I			I	I
Conduct quarterly watershed management committee meetings	3.F.3.g	Mar-02		I	I			NA	I
Amend and adopt county ordinance to enforce all requirements of the permit, if needed	3.G.3	Nov-02		I	I			NA	I
Submit to RWQCB a legal statement demonstrating the necessary legal authority	3.G.4	Dec-02		I	I			I	I
Prepare and submit to the RQWCB individual annual reports	1.B	Aug-02		I	I			I	I
Special Provisions									
Public Information and Participation - Permit Requirements									
Implement public information and participation program	4.B	Feb-02		I	I			I	I
Convene an Advisory Committee	4.B	ASAP		I	I			NA	I
Mark all storm drain inlets with a "no dumping" message	4.B.1.a	Feb-04		I	I			I	I
Maintain the (888) CLEAN-LA hotline	4.B.1.b	Feb-02		I	I			NA	NA
Provide a list of reporting contacts to public through www.888CleanLA.com	4.B.1.b	Mar-02		I	I			I	I
Media campaign for Storm Water Pollution Prevention (SPP)	4.B.1.c.1	Feb-02		I	I			I	I
Strategy to educate ethnic communities about SPP	4.B.1.c.2	Feb-03		I	I			I	NA
Enhance outreach for proper disposal of cigarette butts	4.B.1.c.3	Feb-02		I	I			I	NA
Conduct educational activities within jurisdiction and participate in county-wide events	4.B.1.c.4	Feb-02		I	I			I	NA

Table E-2 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2011-2012									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
Organize Public Outreach Strategy meetings quarterly	4.B.1.c.5	May-02		I	I			NA	NA
Conduct Media Outreach to 35 million impressions per year	4.B.1.c.6	Annually		D	I			NA	NA
Distribute SPP information to K-12 schools	4.B.1.c.7	-		NA	I			I	I
Coordinate and provide contact information for public education activities	4.B.1.c.8	Apr-02		I	I			I	NA
Strategy to measure effectiveness of in-school programs	4.B.c.9	May-02		NA	I			NA	NA
Behavioral change assessment strategy towards SPP	4.B.c.10	May-02		NA	I			NA	NA
Coordinate watershed-specific pollution prevention outreach programs	4.B.1.d	Feb-03		I	I			I	NA
Corporate Outreach Program to target retail gas outlets and restaurant chains	4.B.2.a	Feb-03		NA	I			NA	NA
Coordinate an SPP program for a Business Assistance Program	4.B.2.b	Optional		**	I			NA	I
Industrial/Commercial Facilities Control - Permit Requirements									
Maintain a list of industrial/commercial facilities to be inspected	4.C.1	Aug-02		I	I			I	I
Inspect/visit industrial/commercial facilities appropriately	4.C.2	Aug-04		I	I			I	I
Initiate progressive enforcement for facilities failing to implement BMP's	4.C.3	-		I	I			I	I
Inspect restaurants twice during Permit cycle	4.C.2	Aug-04		D	I			I	I
Development Planning - Permit Requirements									
Implement development planning program that requires SUSMP	4.D	Feb-02		I	I			I	I
Develop peak flow control criteria	4.D.1	Feb-05		I	D			NA	NA
Amend codes and ordinances to give legal effect to SUSMP changes in permit	4.D.2.a	Aug-02		I	I			I	I
Implement revised SUSMP	4.D.2.b	Sep-02		I	I			I	I
Submit an Environmentally Sensitive Areas (ESAs) Delineation map to RWQCB	4.D.2.d	Jun-02		NA	NA			I	NA
Implement SUSMP requirements for industrial/commercial projects >1 acre	4.D.5	Mar-03		I	I			I	I
Update CEQA guidelines to include specific storm water related issues	4.D.11	Feb-02		I	I			I	I

Table E-2 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2011-2012									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
Update General Plan to include specific storm water related issues	4.D.12	-		I	I			**	I
Train targeted employees in permit requirements for Development Planning	4.D.13	Varies		I	I			NA	I
Develop and make SUSMP guidelines available to the developer	4.D.14.a	Feb-02		I	D			I	I
Develop a technical manual for the siting and design of BMPs	4.D.14.b	Feb-04		I	D			NA	NA
Development Construction - Permit Requirements									
Implement a development construction program	4.E.1 &2	Feb-02		I	I			I	I
Require proof of a Waste Discharger ID (WDID) number prior to filing Notice of Intent (NOI)	4.E.2.c	Mar-03		I	I			I	I
Require proof of an NOI and a copy of SWPPP for a transfer of ownership	4.E.3	Feb-02		I	I			I	I
Track the number of issued building and grading permits	4.E.3.c	Feb-02		I	I			I	D
Refer General Construction Activities Stormwater Permit (GCASP) violations to RWQCB	4.E.4	Feb-02		I	I			I	I
Train targeted employees in permit requirements for Development Construction	4.E.5	Varies		I	I			NA	I
Public Agency Activities - Permit Requirements									
Implement a sewer overflow prevention and response program	4.F.1	Aug-02		I	I			I	I
Implement Development Planning Program at Permittee-owned construction projects	4.F.2.a	Aug-02		I	I			I	I
Implement Development Construction Program at Permittee-owned construction projects	4.F.2.b	Feb-02		I	I			I	I
Develop, if needed, and implement SWPPPs for field facilities	4.F.3	Feb-02		I	D			NA	I
Equip wash areas with a clarifier, pre-treatment device, or be connected to sewer	4.F.3.c	Feb-02		I	I			NA	I
Store pesticides/herbicides/fertilizers indoors and apply only in accordance	4.F.4.c&g	Feb-02		I	I			NA	I
Designate Catch Basins as priority A, B, or C	4.F.5.a	Feb-02		I	I			I	I
Ensure that Catch Basins (CBs) are cleaned appropriately	4.F.5.c.1	Feb-02		I	I			I	I
Place temporary screens on CBs prior to special events or cleanout immediately afterwards	4.F.5.c.2	Feb-02		I	I			I	I
Place and maintain trash receptacles at all transit stops with shelters	4.F.5.c.3	Feb-02		I	I			I	I

Table E-2 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2011-2012									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**
Inspect the legibility of CB stencils and re-label within 180 days if necessary	4.F.5.d	-		I	I			I	I
Visually monitor and clean all open channels annually for debris	4.F.5.e.1	Feb-02		I	I			NA	I
Designate curbed streets as priority A, B, or C based on liter accumulation	4.F.6.a.b	Feb-02		I	I			I	I
Recover saw cutting waste and dispose it offsite	4.F.6.c	Feb-02		I	I			I	I
Train targeted employees in permit requirements for Public Agency Activities	4.F.6.d	Varies		I	I			NA	I
Inspect and, if needed, clean Permittee owned parking lots twice per month, but at least once	4.F.7	Feb-02		I	I			I	I
Conduct a dry weather diversion study and create a priority list of drains for diversion	4.F.10	Jul-03		I	D			I	NA
Illicit Connections / Illicit Discharges - Permit Requirements									
Develop an Implementation Program which specifies how revisions of the IC/ID SQMP are implemented	4.G.1.a	-		I	D			I	I
Create a database for permitted storm drain connections and map IC/ID	4.G.1.b	Feb-03		I	I			NA	I
Perform IC/ID Trend Analysis	4.G.1.b	Feb-03		I	I			NA	I
Train targeted employees in the permit requirements for IC/ID	4.G.1.c	Varies		I	I			NA	I
Field screen the storm drain system for illicit connections in open channels	4.G.2.a	Feb-03		NA	I			NA	I
Field screen the storm drain system for illicit connections in underground storm drains in priority areas	4.G.2.a	Feb-05		I	D			I	I
Field screen the storm drain system for illicit connections in underground s/d larger than 36 inch diameter	4.G.2.a	Dec-06		I	D			I	I
Review all permitted connections to the storm drain system for compliance	4.G.2.a	Dec-06		I	I			I	I
Investigate illicit connections 21 days after discovery	4.G.2.b	-		D	I			I	I
Terminate illicit connections 180 days after confirmation	4.G.2.b	-		I	I			I	I
Respond to illicit discharges within one business day of discovery	4.G.3.a	-		D	I			I	I
Investigate illicit discharges as soon as practicable	4.G.3.a	-		I	I			I	I

Table E-2 LAR UR2 WMA Existing Minimum Control Measures Reported during Permit Year 2011-2012									
Program Tasks and Milestones	**2001 MS4 Permit Part**	**Due Date**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**

NA - Not Applicable or Completed
D - Developed
I - Program Implemented/Completed
** - Not Scheduled

Appendix F

Regional and Distributed BMP Comparison Matrix

Table F-1 Regional BMP Comparison Matrix

Ranking Factor	Score (1=worst, 5=best)						
	Infiltration Basins	**Detention Basins**	**Detention with SSF Wetlands**	**Constructed SF Wetlands**	**Treatment Facility**	**Hydrodynamic Devices**	**Channel Naturalization**
Cost							
Capital	4	4	2	4	1	3	4
Operations and Maintenance	1	3	2	2	2	4	3
Effectiveness							
Effluent Concentration							
Trash	5	4	5	5	5	4	2
Nutrients	5	2	5	5	5	2	5
Bacteria	5	2	4	3	5	2	1
Metals	5	3	5	5	5	3	4
Sediment	5	3	5	5	5	4	4
"Other" Pollutant	5	3	4	4	4	3	3
Volume Mitigation	5	3	3	3	2	1	2
Reliability	2	3	3	3	5	3	3
Implementation							
Implementation Issues							
Engineering Feasibility	Based on Site-Specific Evaluation						
Ownership/ROW							
Environmental Clearance	4	4	4	4	2	4	2
Permitting Water Rights	5	5	5	2	2	2	2
Public Safety	3	3	3	3	4	4	3
Environment/Other Factors							
Other Potential Benefits	5	4	4	4	1	1	5
Other Potential Impacts	3	2	3	2	3	3	3

SSF = Subsurface Flow
SF = Surface Flow

Table F-2 Distributed BMP Comparison Matrix

Ranking Factors	Score (1=worst, 5=best)							
	Cisterns	**Bioretention**	**Vegetated Swales**	**Green Roofs**	**Porous/ Permeable Pavements**	**GSRDs**	**Media Filters**	**Catch Basin Inserts**
Cost								
Capital	3	2	4	1	2	2	3	5
Operations and Maintenance	5	3	4	4	5	3	4	4
Effectiveness								
Effluent Concentration								
Trash	5	5	4	4	5	4	5	4
Nutrients	5	5	4	4	5	1	3	1
Bacteria	5	5	1	4	5	1	3	1
Metals	5	5	4	4	5	2	4	1
Sediment	5	5	3	4	5	3	5	2
"Other" Pollutant	4	4	4	4	4	1	4	1
Volume Mitigation	3	4	4	4	4	1	1	1
Reliability	3	4	4	3	2	3	3	3
Implementation								
Implementation Issues								
Engineering Feasibility	Based on Site-Specific Evaluation							
Ownership/ROW								
Environmental Clearance	5	5	5	5	5	5	5	5
Permitting Water Rights	5	5	5	5	5	5	5	5
Public Safety	4	3	3	4	3	4	4	4
Environment/Other Factors								
Other Potential Benefits	5	4	4	4	3	1	1	1
Other Potential Impacts	2	3	3	3	3	3	3	3

GSRDs = Gross Solid Removal Devices

Appendix G

BMP Installation Summary

Table G-1 LAR UR2 WMA BMPs Installed by Year									
BMP Type	**Year Installed**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**	**Total**
Catch Basin Screens									
Automatic Retracting Screens(ARS)	2011-2012	137	154	321	105	136	116	3	972
	2010-2011							10	10
	2009-2010					148			148
United Storm Water Clean Screens III	2010-2011			403			152		555
	Subtotal	137	154	724	105	284	268	13	1,685
BioClean Flume Filter	2011-2012							3	3
	2010-2011							7	7
	2006-2007							2	2
	Subtotal							12	12
BioClean Grate Inlet Skimmer Box	2011-2012							8	8
	2005-2006							1	1
	Subtotal							9	9
Clean Screen Catch Basin Inserts	2010-2011	163	101	288		450			1,002
	2005-2006			29					29
	2004-2005		5						5
	2003-2004		50						50
Full Capture Catch Basin Inserts	2010-2011		146						146
Connector Pipe Screens (CPS)	2011-2012	238	243	545	130	442	151		1,749
	2010-2011							631	631
	Subtotal	401	545	862	130	892		631	3,461

Table G-1 LAR UR2 WMA BMPs Installed by Year

BMP Type	Year Installed	Bell	Bell Gardens	Commerce	Cudahy	Huntington Park	Maywood	Vernon	Total
Catch Basin Inserts/Filters									
Fossil Filter Catch Basin Inserts	2011-2012						4		4
	2010-2011					2			2
	2009-2010	2				2			4
	2008-2009			1					1
	2007-2008	2							2
	2006-2007	2		3					5
	2005-2006			4	4			22	30
	2004-2005			1					1
	Subtotal	6		9	4	4	4	22	49
Kristar Flo Guard Inserts	2008-2009							3	3
	2007-2008							11	11
	2006-2007							11	11
	Subtotal							25	25
Bioclean Catch Basin Inserts	2010-2011							16	16
	2007-2008							7	7
	Subtotal							23	23
Suntree Technologies	2008-2009							2	2
	2007-2008							2	2
	Subtotal							4	4
Catch Basin Insert - Watershed Only	2004-2005							7	7
Catch Basin Inserts	2010-2011			1					1
Kristar Panel	2007-2008							6	6
Filter Insert	2011-2012			1					1
SuntrekTech Catch Basin Insert	2006-2007							2	2

Table G-1 LAR UR2 WMA BMPs Installed by Year

BMP Type	Year Installed	Bell	Bell Gardens	Commerce	Cudahy	Huntington Park	Maywood	Vernon	Total
Sediment/Oil Trap									
CDS Gross Pollutant Separators	2010-2011					1			1
	2005-2006							3	3
	Subtotal					1		3	4
Stormceptor Gross Pollutant Separators	2008-2009							1	1
	2007-2008							1	1
	2006-2007							1	1
	2005-2006							1	1
	2003-2004								2
	Subtotal					1	1	4	6
Vegetated Swale/Strip	2008-2009			3					3
Grease Interceptors	2004-2005							1	1
Grease Trap	2006-2007			1					1
Infiltration BMPs									
Flow-thru Planter	2011-2012			1					1
	2010-2011			1					1
	Subtotal			2					2
Infiltration System	2006-2007			4					4
Infiltration Trenches	2008-2009			1					1
	2006-2007							2	2
	2003-2004					1			1
	Subtotal			1		1		2	4
Landscape/infiltration	2004-2005			2					2

Table G-1 LAR UR2 WMA BMPs Installed by Year

BMP Type	Year Installed	Bell	Bell Gardens	Commerce	Cudahy	Huntington Park	Maywood	Vernon	Total
Trash Bins									
Covered Trash Bins	2010-2011					2			2
	2009-2010					3			3
	2008-2009			3					3
	2005-2006			6	5			9	20
	2004-2005			4					4
	2003-2004		30			2	2		34
	Subtotal		30	13	5	7	2	9	66
Extra Trash Cans	2010-2011					2			2
	2009-2010			10		9			19
	2003-2004	10	30			50	10		100
	Subtotal	10	30	10		61	10		121
Trash Can Lid	2010-2011		50						50
Parks									
Dog Parks	2003-2004					1			1
Other									
Enhanced Street Sweeping	2009-2010	6	46			1			53
	2008-2009	6							6
	2007-2008	6							6
	2006-2007	6							6
	2005-2006	6			1				7
	2003-2004	6			2	1	1		10
	Subtotal	36	46		3	2	1		88
Trash Enclosures	2004-2005							8	8
Catch Basin Signage	2004-2005							8	8
Diversion System with rain switch	2005-2006							1	1

Table G-1 LAR UR2 WMA BMPs Installed by Year									
BMP Type	**Year Installed**	**Bell**	**Bell Gardens**	**Commerce**	**Cudahy**	**Huntington Park**	**Maywood**	**Vernon**	**Total**
Kristar Roof Downspout	2006-2007							6	6
Restaurant Vent Traps	2006-2007			1					1
	2003-2004					2	1		3
	Subtotal			1		2	1		4
Catch Basin Clean-outs cycles	2006-2007	6							6
Safedrain (Spill Prevention Valve)	2007-2008							1	1
	City Total:	**596**	**855**	**1,634**	**247**	**1,256**	**438**	**797**	**5,823**

Appendix H

Non-MS4 NPDES Permittees

Table H-1 Active Permitted Industrial Facilities in Los Angeles County within Bell, Bell Gardens, Cudahy, Huntington Park, and Maywood

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I000777	3/20/1992	Custom Bldg Prods	6511 Salt Lake Ave	Bell	90201	7.0	2899	3272	-
4 19I002530	6/25/2013	US Army Patton Reserve	5340 Bandini Blvd Bldg 334	Bell	90201	21.0	4231	-	-
4 19I022905	6/26/2013	Bell US Army Reserve Center	5631 Rickenbacker Rd	Bell	90201	43.0	4231	9711	-
4 19I023321	9/8/2011	FedEx Home Delivery	4801 S Eastern Ave	Bell	90201	1.0	4215	-	-
4 19I009019	11/3/1992	Temple Inland Inc dba International Paper	5991 Bandini Blvd	Bell[1]	90040	15.0	2653	-	-
4 19I014288	7/1/1998	YRC Inc Los Angeles Bell	4700 S Eastern Ave	Bell[1]	90040	15.0	4231	-	-
4 19I012040	12/14/1995	David H Fell & Co	6009 Bandini Blvd	Bell[1]	90040	0.4	3341	-	-
4 19I001684	3/30/1992	Metal Surfaces	6060 Shull St	Bell Gardens	90201	1.0	3471	-	-
4 19I004413	4/6/1992	J P Turgeon & Sons	7758 Scout Ave	Bell Gardens	90201	0.5	3471	-	-
4 19I003408	4/3/1992	Day Glo Color Corp	4615 Ardine St	Cudahy	90201	1.3	2851	-	-
4 19I010996	5/18/1994	Artson Manufacturing Co	4915 Cecilia St # 4907	Cudahy	90201	3.2	3315	3496	-
4 19I012606	10/15/1996	Consolidated Foundries Inc	8333 Wilcox Ave	Cudahy	90201	3.1	3369	-	-
4 19I013803	3/13/1998	David Downs Co	4539 Cecilia St	Cudahy	90201	75.0	2992	-	-
4 19I016698	8/7/2001	Consolidated Foundaries GE Core Co	8346 Salt Lake Ave	Cudahy	90201	1.0	3369	-	-
4 19I024275	5/28/2013	HF Cox Inc	8330 S Atlantic Avenue	Cudahy	90201	3.2	7538	-	-
4 19I000122	2/21/1992	LA Brass Prod	2529 55th	Huntington Park	90255	1.0	3364	3366	-
4 19I000835	7/18/2012	Henry Co	5731 Bickett St	Huntington Park	90255	5.0	2952	-	-
4 19I001609	3/27/1992	Aircraft Foundry	5316 Pacific Blvd	Huntington Park	90255	0.5	3365	-	-
4 19I001831	3/30/1992	Acme Castings	2319 Randolph St	Huntington Park	90255	1.3	3321	3325	3369
4 19I004458	4/6/1992	LA Galvanizing	2518 E 53rd St	Huntington Park	90255	0.6	3471	-	-
4 19I010372	8/2/1993	Covert Iron Works	7821 Otis Ave	Huntington Park	90255	3.0	3321	-	-
4 19I013694	1/12/1998	Calpac Chemical Co Inc	6231 Maywood Ave	Huntington Park	90255	2.0	2842	-	-
4 19I016489	4/25/2001	Aircraft X-ray Laboratories Inc	5216 Pacific	Huntington Park	90255	1.5	3471	3479	-
4 19I018443	10/29/2003	Bodycote Thermal Processing	3370 Benedict Way	Huntington Park	90255	1.6	3398	-	-
4 19I019552	5/31/2005	H P Used Auto Parts	2461 E Slauson Ave	Huntington Park	90255	0.4	5015	-	-
4 19I020668	2/9/2007	West Coast Foundry	2450 E 53rd St	Huntington Park	90255	Unknown	Unknown	-	-
4 19I021216	10/17/2007	Crown Poly Inc	5700 Bickett St	Huntington Park	90255	5.3	3081	3089	-
4 19I022418	11/24/2009	Joseph Levin & Sons Inc	2863 E Slauson Ave	Huntington Park	90255	2.0	5093	-	-
4 19I023686	6/21/2012	I A Machinery Co	2301 Belgrave Ave	Huntington Park	90255	1.1	3545	3549	3547
4 19I023952	11/30/2012	Ace Recycling LLC	6069 Maywood Ave	Huntington Park	90255	2.9	5093	-	-
4 19I004074	4/6/1992	Alloys Cleaning Inc	1960 Gage	Huntington Park[1]	90001	0.8	3471	-	-
4 19I014184	6/18/1998	Madison Industries	1900 64th	Huntington Park[1]	90001	5.4	3441	-	-
4 19I011248	11/1/1994	LA Unified Sch Dist Alameda Ga	6901 S Alameda St	Huntington Park[1]	90001	4.4	4151	-	-
4 19I021660	7/9/2008	Windsor Foods	6711 through 6717 Alameda St	Huntington Park[1]	90001	1.1	2038	-	-
4 19I000680	3/18/1992	W S Dodge Oil Co Inc	3710 Fruitland Ave	Maywood	90270	1.0	2992	-	-
4 19I010960	3/14/1994	Cook Induction Heating	4925 Slauson Ave	Maywood	90270	0.6	3398	3679	3399
4 19I013344	8/18/1997	Keeney Truck Lines Inc	3500 Fruitland Ave	Maywood	90270	3.0	4212	-	-
4 19I013345	8/18/1997	Food Express Inc	5127 Maywood Ave	Maywood	90270	3.0	4231	-	-
4 19I014688	10/21/1998	Evans Dedicated Systems	5711 Maywood Ave	Maywood	90270	1.4	3081	-	-

Table H-1 Active Permitted Industrial Facilities in Los Angeles County within Bell, Bell Gardens, Cudahy, Huntington Park, and Maywood

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I021671	7/14/2008	Gemini Plastic Ent Inc	3574 Fruitland	Maywood	90270	0.4	5093	-	-
4 19I024365	7/22/2013	Panda International Trading Co	570 Fruitland Ave	Maywood	90270	0.8	3471	-	-

[1] Permittee listed as City of Los Angeles in Permit Documents

Table H-2 Active Permitted Industrial Facilities in Los Angeles County within Commerce

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I000163	2/26/1992	Amvac Chemical Corp	4100 E Washington Blvd	Commerce[1]	90023	3.0	2879	2869	-
4 19I000205	3/2/1992	Ashland Chemical Co	6608 26th	Commerce	90040	5.6	2821	-	-
4 19I000411	3/11/1992	Engineered Polymer Solutions	5501 E Slauson Ave	Commerce[1]	90040	4.0	2821	-	-
4 19I001142	3/25/1992	Calstrip Industries Inc	7140 Bandini Blvd	Commerce[1]	90040	7.0	3316	-	-
4 19I001502	3/27/1992	Hickory Springs	4542 East Dunham St	Commerce	90023	5.9	3086	-	-
4 19I001761	3/30/1992	Monogram Aerospace Fasteners	3423 Garfield Ave	Commerce[1]	90040	3.0	3452	-	-
4 19I002134	3/30/1992	Gallo Wine	2650 Commerce Way	Commerce[1]	90040	7.0	2084	-	-
4 19I002702	4/1/1992	Huhtamaki Inc	4209 Noakes St	Commerce[1]	90023	8.9	2656	3089	2671
4 19I002878	4/2/1992	Newark Pac Paperboard	6001 S Eastern Ave	Commerce	90040	Unknown	Unknown	-	-
4 19I003336	4/3/1992	Oldcastle BuildingEnvelope	5631 Ferguson Dr	Commerce[1]	90022	10.5	3231	-	-
4 19I003406	4/3/1992	Globe Iron Foundry	5649 Randolph St	Commerce	90040	1.6	3321	-	-
4 19I003509	4/3/1992	Vons Grocery Co Safeway	3361 Boxford Ave	Commerce[1]	90040	17.0	2024	2051	2026
4 19I004620	4/8/1992	UPS Ground Freight	2747 Vail Ave	Commerce	90040	Unknown	Unknown	-	-
4 19I004896	4/7/1992	ATK Space Systems Inc	6033 Bandini	Commerce	90040	4.0	3795	3449	-
4 19I005001	4/8/1992	Commerce East LA	4341 Washington	Commerce[1]	90023	218.0	4011	-	-
4 19I005064	4/7/1992	Mission Foods Corp Olympic	5505 E Olympic Blvd	Commerce[1]	90022	4.0	2099	-	-
4 19I006760	5/6/1992	Unified Grocers Inc	5200 Sheila St	Commerce	90040	66.0	4225	-	-
4 19I006988	5/19/1992	Interstate Consolidation	5800 Sheila St	Commerce[1]	90040	7.0	4212	-	-
4 19I007019	5/27/1992	Adelwiggins Grp	5000 Triggs St	Commerce[1]	90022	8.0	3499	-	-
4 19I009384	11/15/1992	LA Paper Box & Board	6027 S Eastern Ave	Commerce[1]	90040	5.0	2631	-	-
4 19I009618	12/22/1992	W R Grace Construction Co	7237 Gage	Commerce[1]	90040	2.0	2899	-	-
4 19I010842	1/4/1994	Ei Du Pont Sardo & Sons Whse	5468 Union Pacific Ave	Commerce	90022	3.5	4225	-	-
4 19I012397	6/24/1996	Tzeng Long Usa Inc	2801 Vail Ave	Commerce	90040	5.0	5093	4225	-
4 19I012612	10/25/1996	Strategic Materials Inc	7000 Bandini Blvd	Commerce	90040	3.0	5093	-	-
4 19I012671	11/22/1996	Fleming Metal Fabricators	2810 Tanager	Commerce	90040	2.0	3499	-	-
4 19I013540	11/20/1997	Precision Wire Products Inc	6150 Sheila	Commerce[1]	90040	10.6	3496	-	-
4 19I013577	12/23/1997	Colonial Dames	6820 Watcher St	Commerce[1]	90040	0.4	2844	-	-
4 19I014215	6/18/1998	Pac Die Casting Corp	6155 S Eastern Ave	Commerce[1]	90040	1.5	3363	-	-
4 19I015449	10/21/1999	Parsec Inc Bnsf Railroad	4000 E Sheila St	Commerce[1]	90023	2.0	4011	-	-
4 19I015576	1/12/2000	US Lubricants	4000 E Washington Blvd	Commerce	90023	2.0	2992	-	-
4 19I015663	3/10/2000	Valley Plating Works Inc	5900 Sheila St	Commerce[1]	90040	4.9	3471	-	-
4 19I016019	8/14/2000	Exide Corp	5909 Randolph	Commerce	90040	1.7	3399	-	-
4 19I016034	8/21/2000	American RENOLIT Corp	6900 Elm St	Commerce[1]	90040	2.0	3081	2821	-
4 19I016230	11/20/2000	API Kirk Containers	2131 Garfield	Commerce[1]	90040	0.2	3089	-	-
4 19I017590	11/3/2002	General Mills	5469 Ferguson	Commerce[1]	90022	3.0	2045	-	-
4 19I018180	6/13/2003	Parsec Operations at BNSF Railway	2818 Eastern Ave	Commerce[1]	90040	36.0	4011	-	-
4 19I018741	4/19/2004	American Graphic Board Inc	5880 East Slauson Ave	Commerce	90040	2.4	2655	-	-
4 19I018851	6/23/2004	Commerce Refuse to Energy Facility	5926 Sheila St	Commerce[1]	90040	6.0	4911	4953	-
4 19I018989	9/2/2004	Wiretech Inc	6440 E Canning St	Commerce	90040	1.6	3315	-	-

Table H-2 Active Permitted Industrial Facilities in Los Angeles County within Commerce

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I020422	8/22/2006	Horizon Milling LLC	5471 Ferguson Dr	Commerce	90022	5.8	2041	-	-
4 19I020783	4/10/2007	Liberty Packing & Estruding Inc	3015 Supply Ave	Commerce	90040	1.1	2673	2671	-
4 19I020805	4/12/2007	OXY USA East LA Facility	5901 Triumph	Commerce	93340	2.4	1311	-	-
4 19I020806	4/12/2007	OXY USA Bandini Facility	5141 Astor	Commerce	93340	1.0	1311	-	-
4 19I020821	4/12/2007	Signature Flexible Packaging	5519 Jillson St	Commerce	90040	0.6	2673	-	-
4 19I020881	5/14/2007	US Polymers Inc	5910 Bandini	Commerce	90040	1.5	3084	3082	3087
4 19I020887	5/16/2007	E Z Plastic Packaging Corp	2051 S Garfield Ave	Commerce	90040	1.7	3081	-	-
4 19I021220	10/19/2007	FP International	6195 E Randolph St	Commerce	90040	1.7	3086	-	-
4 19I021380	8/15/2012	Superior Printing Ink Co Inc	2121 Yates Ave	Commerce	90040	0.4	2893	-	-
4 19I021525	4/14/2008	Southern Fiber Los Angeles LLC	2748 Tanager Ave	Commerce	90040	2.0	2297	-	-
4 19I021540	4/29/2008	Kaiser Aluminum	6250 E Bandini Blvd	Commerce[1]	90040	4.5	3354	3341	-
4 19I022102	4/10/2009	Kerry Ingredients & Flavours	1916 Tubeway Ave	Commerce	90040	2.5	2087	-	-
4 19I022351	10/7/2009	SI Tourcoach	1230 S Tubeway Ave	Commerce	90040	2.0	4173	-	-
4 19I023412	11/28/2011	Smart and Final Distribution	5500 Sheila St	Commerce	90040	23.0	4225	-	-
4 19I023650	5/31/2012	Replanet LLC	5603 Randolph St	Commerce	90040	2.7	5093	-	-
4 19I023653	6/4/2012	Green Land Metals Inc	6400 Bandini Blvd	Commerce	90040	0.6	5093	-	-
4 19I023769	8/7/2012	99 Cent Only Stores	4000 Union Pacific Ave	Commerce	90023	20.7	5149	5099	-
4 19I023992	12/27/2012	Western State Industrial	5635 Sheila St	Commerce	90040	0.7	5051	-	-
4 19I024214	4/22/2013	Sun Plastics Inc	7140 East Slauson Ave	Commerce	90040	2.5	3089	-	-
4 19I024241	5/6/2013	Spirit Foodservice Inc	5951 Rickenbacker Road	Commerce	90040	0.8	3089	-	-
4 19I024336	7/2/2013	Arion Global Inc	2919 Tanager Ave	Commerce	90040	0.7	5093	-	-
4 19I000163	2/26/1992	Amvac Chemical Corp	4100 E Washington Blvd	Commerce[1]	90023	3.0	2879	2869	-

[1] Permittee listed as City of Los Angeles in Permit Documents

Table H-3 Active Permitted Industrial Facilities in Los Angeles County within Vernon

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I000107	2/20/1992	Ajax Forge Co	1956 E 48th St	Vernon[1]	90058	0.9	3462	-	-
4 19I000335	3/11/1992	Punch Press Products Inc	2035 51st	Vernon	90058	2.5	3469	-	-
4 19I000341	3/11/1992	King Meat Inc	4215 Exchange	Vernon	90058	4.3	2013	-	-
4 19I000505	3/13/1992	Metro Division 34	4462 Pacific Blvd	Vernon	90058	Unknown	Unknown	-	-
4 19I000688	3/18/1992	Gasser Olds Co	2618 Fruitland Ave	Vernon	90058	0.9	3369	3499	3365
4 19I000797	3/20/1992	West Coast Rendering	4105 Bandini Blvd	Vernon[1]	90023	2.4	2077	-	-
4 19I001136	3/25/1992	Lubricating Specialties	3365 E Slauson Ave	Vernon	90058	0.3	5171	2992	-
4 19I001435	3/27/1992	Coast Packing Company	3275 Vernon	Vernon	90058	3.0	2079	-	-
4 19I001661	3/27/1992	Bodycote Thermal Proc	2900 S Sunol Dr	Vernon	90023	2.0	3398	-	-
4 19I001697	10/10/2011	Norton Packaging Inc	5800 S Boyle Ave	Vernon	90058	5.0	3089	-	-
4 19I002066	3/30/1992	L A Junction R&R	4433 Exchange Ave	Vernon[1]	90058	2.0	4011	-	-
4 19I002078	3/30/1992	United Parcel Service	4925 Boyle	Vernon	90058	2.0	4215	-	-
4 19I002083	3/30/1992	United Parcel Ser Cagvs	3333 S Downey Rd	Vernon[1]	90023	15.0	4215	-	-
4 19I002142	3/30/1992	Tremco Manufacturing	3060 E 44th St	Vernon	90058	2.1	2952	-	-
4 19I002179	3/30/1992	FedEx Freight Inc SLG	4500 Bandini Blvd	Vernon	90058	16.0	4213	-	-
4 19I002639	4/1/1992	Exxon Mobil Oil Corp Vernon Cu	2619 37th	Vernon	90058	18.0	5171	-	-
4 19I002920	4/2/1992	Dunn Edwards Corp	4885 E 52nd Pl	Vernon[1]	90040	6.4	2851	-	-
4 19I002950	4/2/1992	Air Prod & Chemicals	3305 E 26th St	Vernon[1]	90023	5.0	2899	-	-
4 19I002998	4/2/1992	City Fibers Inc	2500 S Santa Fe Ave	Vernon[1]	90058	4.0	5093	-	-
4 19I003535	4/3/1992	Alpert & Alpert Iron & Metal	1820 S Soto St	Vernon[1]	90023	7.0	5093	-	-
4 19I003834	4/3/1992	F & S Distributing Co Inc	4444 E 26th St	Vernon[1]	90023	3.4	4225	-	-
4 19I004283	4/6/1992	Neptune Foods	4510 Alameda	Vernon	90058	2.0	2092	-	-
4 19I004285	4/6/1992	Clougherty Packing Co	3049 E Vernon Ave	Vernon	90058	19.0	2013	-	-
4 19I004956	4/7/1992	Norman Fox and Co	5611 S Boyle Ave	Vernon	90058	4.9	2841	2843	-
4 19I005336	4/10/1992	Rehrig Pacific Co	4010 26th	Vernon[1]	90023	4.7	3089	2821	-
4 19I005454	4/7/1992	Sandberg Furniture	3251 E Slauson Ave	Vernon[1]	90058	11.0	2511	-	-
4 19I005929	4/17/1992	Darling Delaware Co	2626 E 25th St	Vernon[1]	90058	5.0	2077	-	-
4 19I006257	4/22/1992	Catalina Pacific Concrete Co	1862 E 27th St	Vernon[1]	90058	1.0	3273	-	-
4 19I006948	5/11/1992	Barksdale Inc	3211 Fruitland Ave	Vernon[1]	90058	5.0	3499	-	-
4 19I007214	6/18/1992	Engineered Coating Tech Inc	2838 E 54th St	Vernon	90058	0.2	2851	-	-
4 19I009526	12/2/1992	Vernon Warehouse Liquid Division	2322 37th	Vernon	90058	1.9	2099	2869	-
4 19I009847	3/18/1993	General Mills	4309 Fruitland	Vernon	90058	7.0	2041	-	-
4 19I009855	6/8/2011	FLOWSERVE	2300 VERNON	Vernon[1]	90058	13.0	3561	-	-
4 19I009927	4/22/1993	Arcadia Inc	3225 E Washington Blvd	Vernon	90023	Unknown	Unknown	-	-
4 19I009970	5/27/1993	D K Enviromental	3650 E 26th St	Vernon	90058	2.0	4953	-	-
4 19I010454	8/17/1993	Quickway Trucking Co	2929 E 50th St	Vernon[1]	90058	3.0	4214	-	-
4 19I010612	9/20/1993	Core Mark Int	2311 E 48th St	Vernon[1]	90058	6.4	4213	-	-
4 19I010685	10/20/1993	Modern Pattern & Foundry Co	5610 Alcoa Ave	Vernon	90058	1.0	3325	3365	-
4 19I011162	9/16/1994	Robertsons Ready Mix Los Angeles	3365 26th	Vernon[1]	90023	3.0	3273	-	-

Table H-3 Active Permitted Industrial Facilities in Los Angeles County within Vernon

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I011194	9/30/1994	Cargill Inc	2750 Jewel Ave	Vernon	90058	3.3	2079	-	-
4 19I011284	11/22/1994	Four Star Chemical	3137 E 26th St	Vernon[1]	90023	3.0	2869	-	-
4 19I011463	3/8/1995	P Kay Metal Supply	2448 E 25th St	Vernon[1]	90058	0.7	3369	-	-
4 19I011862	9/14/1995	Packaging Advantage Corp	4633 S Downey Rd	Vernon[1]	90058	12.0	2841	2844	2842
4 19I012393	6/24/1996	Clorox Products Manufacturing Co	4333 Bandini	Vernon	90023	7.0	2819	-	-
4 19I012450	7/31/1996	LA Fiber Co	920 S Boyle Ave	Vernon	90058	2.8	2299	-	-
4 19I012994	3/19/1997	BNSF Railway Hobart	3770 E Washington Blvd	Vernon[1]	90023	2.0	4212	-	-
4 19I013129	6/25/1997	Vest Inc	6023 Alcoa Ave	Vernon	90058	10.0	3317	-	-
4 19I013230	7/1/1997	Innovative Waste Control Inc T	4133 Bandini Blvd	Vernon	90023	2.0	4953	-	-
4 19I013457	10/8/1997	Fed Ex Ground	2600 28th	Vernon	90058	13.0	4215	-	-
4 19I014854	12/22/1998	Sweetener Products Co Trucking Division	4181 Ross St	Vernon	90058	2.8	4231	-	-
4 19I015027	3/23/1999	Heitz Trucking Inc	3575 Ross St	Vernon	90058	2.0	4212	4213	-
4 19I015100	5/7/1999	Packaging Co CA	4240 Bandini Blvd	Vernon[1]	90023	12.0	2653	-	-
4 19I015868	11/20/2012	ExxonMobil Oil Corp Vernon Terminal	2709 37th	Vernon	90058	3.0	5171	-	-
4 19I016288	12/21/2000	Cherokee Chemical Co Inc	3540 E 26th St	Vernon[1]	90023	2.0	2899	-	-
4 19I016397	3/14/2001	US Radiator Corp	4423 District Blvd	Vernon	90058	2.0	3714	-	-
4 19I016811	9/25/2001	Dependable Highway Express Inc	2626 E 26th St	Vernon	90058	4.0	4212	4213	-
4 19I017351	7/3/2002	Earthgrains Baking Company Inc	5200 S Alameda St	Vernon	90058	7.9	2051	-	-
4 19I017499	9/25/2002	J&J Snack Food	5353 Downey	Vernon	90058	8.0	2052	-	-
4 19I017741	1/8/2003	Seven Up Rc Botting Co	3220 E 26th St	Vernon	90058	22.0	2086	-	-
4 19I018427	10/24/2003	Southwest Processors Inc	4120 Bandini Blvd	Vernon[1]	90023	4.0	4952	4953	2077
4 19I018451	10/29/2003	Aerojet Rocketdyne Inc	2929 E 54th St	Vernon[1]	90058	3.0	3483	-	-
4 19I018475	11/24/2003	Aul Pipe Tube & Steel Inc	701 S Bonnie Beach Pl	Vernon[1]	90023	0.6	3317	-	-
4 19I018486	12/5/2003	Allied Feather & Down Corp	2661 E 46th St	Vernon	90058	0.9	3999	-	-
4 19I018493	12/5/2003	Hollander Home Fashion Corp	553 Seville Ave	Vernon	90058	2.8	2392	-	-
4 19I018501	12/8/2003	C S America Inc	4309 Exchange Ave	Vernon[1]	90058	1.8	2281	-	-
4 19I018503	12/8/2003	Randall Foods Inc	2905 E 50th St	Vernon	90058	2.0	2015	-	-
4 19I018508	12/10/2003	Overhill Farms	2727 E Vernon Ave	Vernon[1]	90058	3.9	2038	-	-
4 19I018509	12/10/2003	Overhill Farms No 2	3055 E 44th St	Vernon[1]	90058	1.0	2038	-	-
4 19I018514	12/15/2003	Huxtables Kitchen	2100 E 49th St	Vernon[1]	90058	1.2	2038	2099	-
4 19I018516	12/15/2003	Camino Real Foods Inc	2638 E Vernon Ave	Vernon[1]	90058	3.0	2011	2099	-
4 19I018518	12/15/2003	Fruitland Assoc	3336 Fruitland Ave	Vernon	90058	5.0	5147	4222	2038
4 19I018579	1/14/2004	Clougherty Packing Co	2750 E 37th St 2730 And2740	Vernon	90058	4.0	2013	-	-
4 19I018594	1/22/2004	F J Food Service Inc	3855 S Soto St	Vernon[1]	90058	2.0	2013	-	-
4 19I018597	1/23/2004	Dot Line Transp	4366 E 26th St	Vernon[1]	90023	4.6	4213	-	-
4 19I018625	2/6/2004	Square H Brands Inc	2731 S Soto St	Vernon[1]	90023	3.8	2013	-	-
4 19I018628	10/3/2012	Orient Fisheries Intl	5970 Alcoa Ave	Vernon[1]	90058	1.3	919	-	-
4 19I018647	2/18/2004	As Match Dyeing	522 E 37th St	Vernon[1]	90058	4.6	2261	-	-
4 19I018715	3/26/2004	A 1 Express Delivery Services	4520 S Maywood Ave	Vernon	90058	1.8	4213	-	-

Table H-3 Active Permitted Industrial Facilities in Los Angeles County within Vernon

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I018753	4/22/2004	Screamline Inv Tourcoach	2715 Bonnie Beach	Vernon	90023	Unknown	4173	-	-
4 19I018836	6/14/2004	Consolidated Fabricators Corp	4600 S Santa Fe Ave	Vernon[1]	90058	3.5	3469	-	-
4 19I018866	6/23/2004	Kal Plastics	2050 48th	Vernon[1]	90058	1.3	3089	-	-
4 19I018894	7/12/2004	Caltex Plastics Inc	2380 E 51st St	Vernon	90058	1.8	3081	-	-
4 19I018907	7/21/2004	Lifoam Industries LLC	2340 E 52nd St	Vernon[1]	90058	1.5	3086	-	-
4 19I018922	7/27/2004	Metal Improvement Co LLC	3239 E 46th St	Vernon[1]	90058	1.1	3398	-	-
4 19I018952	8/6/2004	Atlas Galvanizing LLC	2639 Leonis Blvd	Vernon[1]	90058	0.1	3479	-	-
4 19I018954	8/6/2004	Engine Trend Co	4515 S Soto St	Vernon[1]	90058	0.5	5015	-	-
4 19I018965	8/17/2004	Evergreen Scientific	2254 to 2300 E 49th St	Vernon[1]	90058	6.0	3089	-	-
4 19I018970	8/19/2004	Vernon Pallets Inc	875 E 27th St	Vernon[1]	90058	2.0	2448	-	-
4 19I018987	9/2/2004	Baker Coupling Co Inc	2929 S Santa Fe Ave	Vernon[1]	90058	2.0	3494	-	-
4 19I019033	9/8/2004	Edris Plastic Mfg Inc	4560 Pacific Blvd	Vernon	90058	1.5	3089	-	-
4 19I019039	9/14/2004	Stericycle Inc	2775 E 26th St	Vernon	90023	1.9	4953	-	-
4 19I019096	10/14/2004	Flores Design Fine Furniture Inc	4618 Pacific Blvd	Vernon	90058	2.4	2512	-	-
4 19I019122	11/5/2004	Stone Blue Inc	2501 28th	Vernon	90058	2.0	7211	-	-
4 19I019267	9/27/2011	RCH Supply Co Inc	4511 Everett	Vernon	90058	0.3	5085	2842	-
4 19I019373	3/22/2005	Commercial Sandblast Company	2678 East 26th St	Vernon	90058	3.0	3471	-	-
4 19I019379	3/23/2005	Joes Plastics Inc	5725 District Blvd	Vernon[1]	90040	2.0	3089	-	-
4 19I019422	4/15/2005	Oseguera Trucking Co Inc	2634 E 26th St	Vernon[1]	90058	2.0	4214	-	-
4 19I019433	4/20/2005	Dollar Empire LLC	4423 Bandini Blvd	Vernon	90023	3.7	4225	-	-
4 19I019450	5/4/2005	Saia Motor Freight Line Inc	2550 28th	Vernon	90058	7.8	4213	-	-
4 19I019453	5/4/2005	Simply Fresh Fruit	4383 Exchange Ave	Vernon[1]	90058	2.6	2024	-	-
4 19I020300	6/21/2006	F Gavina & Sons Inc	2700 Fruitland Ave	Vernon	90058	8.7	2095	-	-
4 19I020418	8/21/2006	Superior Electric Motor Service	4623 Hampton St	Vernon	90058	Unknown	Unknown	-	-
4 19I020625	1/4/2007	Vernon Air Separation Plant 870	5555 District Blvd	Vernon	90058	7.0	2813	-	-
4 19I020647	1/24/2007	Ameripride Uniform Services	5950 Alcoa Ave	Vernon	90058	Unknown	Unknown	-	-
4 19I020880	5/11/2007	Pacific Coast Trans Vernon	1925 E Vernon Ave	Vernon	90058	0.5	4213	-	-
4 19I021228	10/19/2007	Arcadia Inc	2301 E Vernon Ave	Vernon	90058	5.9	3499	-	-
4 19I021527	4/14/2008	Vernon City Light & Power Dept	4990 Seville Ave	Vernon	90058	0.4	4911	-	-
4 19I021537	4/23/2008	Malburg Generating Station	4963 Soto St	Vernon	90058	3.4	4911	-	-
4 19I021543	4/30/2008	Hannibal Industries INC	3851 Santa Fe Ave	Vernon[1]	90058	Unknown	Unknown	-	-
4 19I021637	7/1/2008	AFC Hydraulic Seals	4926 S Boyle Ave	Vernon	90058	0.2	3053	-	-
4 19I021752	8/21/2008	Rancho Foods Inc	2528 E 37th St	Vernon	90058	1.6	2011	-	-
4 19I022040	2/17/2009	Strategic Materials Inc	3211 E 26th St	Vernon	90058	3.7	5093	-	-
4 19I022161	5/28/2009	Progressive Fram & Fabrication	5050 Euerett Ct	Vernon	90058	0.5	3441	3452	-
4 19I022239	7/27/2009	Premier Meat Co	5030 Gifford Ave	Vernon	90058	0.5	5147	-	-
4 19I022277	8/13/2009	Sewing Collection Inc	3113 E 26th St	Vernon	90058	Unknown	3089	-	-
4 19I022281	8/18/2009	PABCO Paper	4460 Pacific Blvd	Vernon	90058	Unknown	Unknown	-	-
4 19I022592	4/13/2010	Waste Management Healthcare Solutions Inc	4280 Bandini Blvd	Vernon	90058	2.3	4953	-	-

Table H-3 Active Permitted Industrial Facilities in Los Angeles County within Vernon

WDID	Status Date	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility Zip Code	Facility Area (acres)	SIC	SIC	SIC
4 19I022644	5/19/2010	Command Packaging	3840 E 26th St	Vernon	90058	4.6	3081	-	-
4 19I022704	7/7/2010	Pacific Precision Formulators	5511 District Blvd	Vernon	90058	1.0	2992	-	-
4 19I022726	7/19/2010	Geo Plastics	2200 E 52nd St	Vernon	90058	2.3	3089	-	-
4 19I022781	8/10/2010	Great American Packaging	4361 S Soto St	Vernon	90058	1.3	2673	-	-
4 19I022931	12/6/2010	V & L Prodce Inc	2550 E 25th St	Vernon	90058	0.1	4225	-	-
4 19I023091	4/5/2011	Valley Fruit and Produce Co	2043 Ross St	Vernon	90058	1.4	5148	-	-
4 19I023121	4/25/2011	Vans Natural Foods	3285 Vernon Ave	Vernon	90058	1.8	2099	-	-
4 19I023354	9/30/2011	Forever 21 Distribution Center	2800 2860 Sierra Pine Ave	Vernon	90058	4.1	4225	-	-
4 19I023474	1/20/2012	Service Oil Co Transportation Inc	5122 S Atlantic Blvd	Vernon	90058	0.3	4213	-	-
4 19I023485	1/26/2012	Yi Bao Produce Group Inc	3105 Leonis Blvd	Vernon	90040	2.5	4222	-	-
4 19I023644	5/24/2012	Pencco Inc	4921 Gifford Ave	Vernon	90058	1.5	2819	-	-
4 19I023654	6/4/2012	D and W Fine Pack	4380 Ayers Ave	Vernon	90058	2.6	2671	-	-
4 19I023667	6/19/2012	Axex Inc	4641 Hampton St	Vernon	90058	0.2	4226	-	-
4 19I023683	6/20/2012	PPP LLC	5991 Alcoa Ave	Vernon	90058	2.1	3089	5093	-
4 19I023721	7/16/2012	Ryerson	4310 E Bandini Blvd	Vernon	90058	9.2	5051	-	-
4 19I023765	8/3/2012	Primo Corporation	3301 Fruitland Ave	Vernon	90058	2.3	3089	-	-
4 19I023878	10/19/2012	Exide Technologies	2700 S Indiana Ave	Vernon	90058	15.0	3341	-	-
4 19I023880	10/19/2012	Holliday Rock Vernon 24	2822 South Soto Street	Vernon	90058	2.6	3273	-	-
4 19I023907	11/2/2012	Pactiv Packaging Inc	3751 Seville Ave	Vernon	90058	7.0	3089	-	-
4 19I023939	11/30/2012	Proportion Foods LLC	3501 E Vernon Ave	Vernon	90058	3.5	2011	-	-
4 19I023940	11/30/2012	CLW Foods LLC	3425 E Vernon Ave	Vernon	90058	4.6	2011	-	-
4 19I023950	11/30/2012	CR Laurence Co Inc	2200 E 55th Street	Vernon[1]	90058	10.8	3442	-	-
4 19I023967	12/17/2012	CR Laurence Co Inc	2100 E 38th St	Vernon[1]	90058	6.2	3442	-	-
4 19I024017	1/23/2013	Americold Vernon 3	4224 District Blvd	Vernon	90058	8.7	2092	-	-
4 19I024176	3/28/2013	Pacific Blue Wash House Inc	2713 South Bonnie Beach Place	Vernon	90058	0.3	7211	-	-
4 19I024273	5/28/2013	Siemens Water Technologies LLC	5375 S Boyle Avenue	Vernon	90058	4.5	4953	-	-

[1] Permittee listed as City of Los Angeles in Permit Documents

Table H-4 General Individual Permitted Facilities in Los Angeles County within Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon

Order No.	CI No.	Discharger	Facility Address	Facility City, State, and Zip Code	Program Type	General or Individual	Active Historical	Effective Date	Facility Area (acres)
2006-0003-DWQ	None	Bell City	6330 Pine Avenue	Bell, CA	NON15	G	Active	--	
R4-2003-0108	8385	Southern California Water Co.	6424 S. Otis Ave	Bell, CA	NPDES	G	Active	1/14/2004	
R4-2003-0108	8729	Southern California Water Co.	7026 Walker Ave	Bell, CA	NPDES	G	Active	4/23/2004	
R4-2003-0108	8666	Southern California Water	6612 Bissell St	Bell, CA 90210	NPDES	G	Active	10/4/2003	
2006-0003-DWQ	None	Bell Gardens City	7100 Garfield Avenue South	Bell Gardens, CA	NON15	G	Active	--	
R4-2003-0108	8762	Southern California Water Co.	6440 Clara St	Bell Gardens, CA 90201	NPDES	G	Active	6/24/2004	
R4-2003-0108	8184	Southern California Water Co.	6112 E. Gage Ave	Bell Gardens, CA 90201	NPDES	G	Active	12/23/2003	
R4-2003-0108	7708	Bell Gardens DPW	6607 Florence Place	Bell Gardens, CA 90201	NPDES	G	Active	10/23/2003	
R4-2007-0019	9613	6863 East Florence Place, LLC	6863/45 East Florence Place	Bell Gardens, CA 90201	NON15	G	Active	6/21/2010	
P 8163	6389C	Maravilla Transport	5936 E. Clara St	Bell Gardens, CA 90201	NON15	I	C	1/23/1978	
2006-0003-DWQ	None	Commerce City	2535 Commerce Way	Commerce, CA	NON15	G	Active	--	
P 8416	6623C	Apex Drum Co.	6226 Ferguson Dr	Commerce, CA 90022	NON15	I	C	3/22/1982	
R4-2007-0019	9875	Univar USA Inc.	4256 Noakes St	Commerce, CA 90023	NON15	G	Active	3/25/2013	
R4-2003-0108	9802	California Water Service Company	2000 S. Tubeway Ave	Commerce, CA 90040	NPDES	G	Active	3/28/2012	
P 8462	6655C	Benjamin Moore & Co.	3325 S. Garfield Ave	Commerce, CA 90040	NON15	I	C	2/28/1983	
2006-0003-DWQ	None	Cudahy City	5220 Santa Ana St	Cudahy, CA 90201	NON15	G	Active	--	
R4-2003-0108	9229	Tract 180 Water Company	4566 Florence Ave	Cudahy, CA 90201	NPDES	G	Active	2/20/2007	
2006-0003-DWQ	None	Huntington Park City	6550 Miles Avenue	Huntington Park, CA	NON15	G	Active	--	
R4-2003-0108	7942	Walnut Park Mutual Water Co.	2460 E. Florence Ave	Huntington Park, CA 90255	NPDES	G	Active	11/26/2003	
2006-0003-DWQ	None	Maywood City	4319 Slauson Avenue East	Maywood, CA	NON15	G	Active	--	
R4-2008-0032	9917	Maywood Mutual Water Company No. 3	6253 Prospecet Ave	Maywood, CA 90270	NPDES	G	Active	2/19/2013	
R4-2009-0047	9172	Maywood Mututal Water Company	4421 E. 52nd Street	Maywood, CA 90270	NPDES	G	Active	1/14/2011	
2006-0003-DWQ	None	Vernon City	4305 Santa Fe Avenue	Vernon, CA	NON15	G	Active	--	
R4-2007-0019	8676	Soco West, Inc.	3270 E. Washington Blvd	Vernon, CA 90023	NON15	G	Active	8/27/2012	
R4-2009-0047	7652	Coast Packing Co.	3275 E. Vernon Ave	Vernon, CA 90058	NPDES	G	Active	6/10/2010	
R4-2009-0068	8160	ExxonMobil Oil Corporation	2709 E. 37th St	Vernon, CA 90058	NPDES	G	Active	8/6/2009	
R4-2010-0087	6079	Owens-Illinois, Incorporated	2901 Fruitland Ave	Vernon, CA 90058	NPDES	I	Active	7/3/2010	
R4-2010-0087-R01	6079	Owens-Illinois, Incorporated	2901 Fruitland Ave	Vernon, CA 90058	NPDES	I	Active	3/2/2012	
P 8255	6505C	Millennium Tech	2438 E. 55th St	Vernon, CA 90058	NON15	I	C	3/24/1980	
R4-2003-0108	8717	California Water Service Co.			NPDES	G	Active	2/25/2004	

NON15 = New, General, Nonsubchapter 15 Program
NPDES = NPDES Permit

Appendix I

Secondary Funding Opportunities

Table I-1 Potential Grant Programs to Fund LAR UR2 WMA WMP Implementation			
Grant Program	**Proposition 84 Stormwater Program**	**Proposition 84 (Chapter 2, §75026) Integrated Regional Water Management (IRWM)**	**Proposition 84 Urban Stream Restoration**
Department	State Water Resources Control Board (SWRCB)	SWRCB	SWRCB
Purpose	Provides funding for projects that reduce and prevent stormwater contamination of rivers, lakes, and streams.	Projects to assist local public agencies to meet long-term water management needs of the State, including the delivery of safe drinking water, flood risk reduction, and protection of water quality and the environment.	Projects that reduce urban flooding and erosion, restore environmental values, and promote stewardship of urban streams.
Eligibility Requirements	Local public agencies	Local public agencies or nonprofit representing an accepted IRWM Region	Local government agencies and citizens groups/nonprofits (together)
Eligible Uses	➢ Implement Low Impact Development (LID) and other onsite and regional practices that seek to maintain predevelopment hydrology. ➢ Comply with stormwater related TMDL requirements	Projects that implement IRWM Plans	Creek cleanups; eradication of exotic or invasive plants; revegetation efforts; bioengineering bank stabilization projects; channel reconfiguration to improve stream geomorphology and aquatic habitat functions; acquisition of parcels critical for flood management; and coordination of community involvement in projects.
Ineligible Uses	Operation and maintenance activities	Operation and maintenance activities	Exclusively educational or fish and wildlife enhancement projects; lake or reservoir enhancements; planning only projects; and mitigation for development or other projects
Funding Limits	$250,000 to $3,000,000 per project Requires 20% match (less for Disadvantaged Communities (DACs))	➢ Bond funding allocation for entire program is $1,000,000,000. ➢ Prop 84 allots grant funding to 11 funding areas. ➢ Each proposal solicitation package will have predetermined amount of funds available.	$1,000,000 per eligible project
Terms/Dates	Round 2 proposals were due February 27, 2014 with grants being awarded by June 2014, ending Round 2. Future opportunities will be presented at a future time.	➢ 25% minimum cost share with waivers for DACs ➢ Round 3 expected in Fall 2014 (approximately $130,000,000 available for Los Angeles Funding Areas)	Next grant application solicitation anticipated in Spring 2014 ($9,000,000 available)
Website	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/prop84/index.shtml	http://www.water.ca.gov/irwm/grants/	http://www.water.ca.gov/urbanstreams
Examples	➢ City of Los Angeles Broadway Neighborhood Stormwater Greenway Project ➢ City of Encinitas Cottonwood Creek Watershed LID Retrofit Project	➢ City of Carson's Trash Reduction Automatic Retracting Screen Project ➢ Dominguez Gap Spreading Grounds West Basin Percolation Improvements ➢ Oxford Retention Basin Multi-Use Enhancement Project ➢ Vermont Avenue Stormwater Capture and Green Street Project.	➢ Restoration of Berkshire Creek sponsored by Pasadena and Arroyo Seco ➢ Dry Canyon Creek Historic Meander Restoration sponsored by the City of Calabasas ➢ Upper Otay Watershed Restoration Project sponsored by the City of San Diego Water Department
Comments	All projects awarded funds through this grant program have planning and monitoring requirements or an implementation requirement. The projects funded through this program also involve LID or green streets in order to reduce and prevent stormwater contamination of rivers, lakes, and streams. This program gives agencies the opportunity to enhance water quality while also assisting in compliance.	IRWM is a collaborative effort to manage all aspects of water resources in a region. IRWM crosses jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions. Some eligible project types include: ➢ Stormwater capture, storage, clean-up, treatment, and management; ➢ Non-point source pollution reduction, management, and monitoring; ➢ Groundwater recharge and management projects; ➢ Planning and implementation of multipurpose flood management programs; and ➢ Watershed protection and management.	LAR UR2 WMA may be able to take advantage of this funding opportunity if the proposed projects are related to stream restoration. If project concepts change in the future, this opportunity may be more applicable..
LAR UR2 WMA Potential Uses	➢ Regional BMP Projects ➢ Distributed BMP Projects	➢ Regional BMP Projects ➢ Distributed BMP Projects	No projects apply at this time
Contact Information	Erik Ekdahl Division of Financial Assistance Project Development (916) 341-5877 Erik.Ekdahl@waterboards.ca.gov	(916) 651-9613 or email DWR_IRWM@water.ca.gov	Program Manager Amy Young Staff Environmental Scientist (916) 651-9626 Amy.Young@water.ca.gov

Table I-1 Potential Grant Programs to Fund LAR UR2 WMA WMP Implementation			
Grant Program	**Community Action for a Renewed Environment (CARE)**	**Pollution Prevention (P2)**	**Clean Beaches Initiative (CBI)**
Department	United States Environmental Protection Agency (USEPA)	USEPA	SWRCB
Purpose	Provide support to help communities form collaborative partnerships, develop a comprehensive understanding of many sources of risk from toxics and environmental pollutants, set priorities and identify and carry out projects to reduce risks through collaborative action at the local level.	Fund projects that help reduce hazardous substances, pollutants, or contaminants entering waste streams or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, disposal or energy recovery activities.	Projects that restore and protect water quality of coastal waters, estuaries, bays, and near shore waters, with an emphasis on projects that reduce bacterial contamination on public beaches.
Eligibility Requirements	Local non-profit organizations, Native American Organizations, quasi-public non-profit organizations, inter and intrastate, local government, colleges, and universities.	State governments, colleges, and universities, federally-recognized tribes and intertribal consortia.	Local agencies, public agencies, non-profits, and Indian tribes
Eligible Uses	Community projects involving education of environmental pollutants	Projects that implement pollution prevention technical assistance services and/or training for businesses and support projects that utilize pollution prevention techniques to reduce and/or eliminate pollution from air, water, and/or land.	Planning and implementation projects meeting CBI priorities
Ineligible Uses	Not identified	Not identified	Operation and maintenance activities
Funding Limits	➢ Two funding levels: $75,000-$100,000 and $150,000-$300,000 ➢ No matching required	➢ Approximately forty grants awarded annually for $20,000-$180,000 ➢ 50 percent match required	$150,000 to $5,000,000 Requires match (variable based on project or if benefits a DAC)
Terms/Dates	Applications dates are to be determined.	Grants are usually awarded between May and August and application deadlines are currently unavailable, but will be posted online.	➢ Continuous funding cycle, with intermittent closures to review proposals, until funds are exhausted ($49,500,000 available). ➢ Applications through Financial Assistance Application Submittal Tool (FAAST)
Website	www.epa.gov/care	http://www.epa.gov/p2/pubs/grants/index.htm	http://www.waterboards.ca.gov/water_issues/programs/beaches/cbi_projects/index.shtml
Examples	➢ Environmental Justice Action Collaborative for Maywood in 2010 ➢ Environmental Health Coalition - Clean Ports in 2009 ➢ Pacoima Beautiful in 2007 and 2005	➢ Funded the Santa Ynez Band of Chumash Indians and trained over 1,700 business employees regarding pollution prevention techniques (2013) ➢ Funded the University of California San Francisco so that a database could be developed that identifies environmentally friendlier product alternatives (2012)	➢ Los Angeles Sanitation District and City of Los Angeles Ballona Creek Water Quality Improvement and Beneficial Use Project ➢ City of Santa Cruz Reduce Sources of Bacteria at Cowell Beach and Main Beach Project ➢ Low flow diversions and sewer improvements
Comments	CARE projects have been implemented and funded within the United States since 2005. LAR UR2 WMA may be able to take advantage of the CARE grant opportunity to fund community programs associated with MCM program elements involving community outreach.	P2 has funded various training and educational programs across the United States. LAR UR2 WMA may be able to benefit from this grant program in order to implement requirements associated with the M4 Permit required MCMs and other pollution prevention training programs.	The projects awarded this grant promote LID and projects designed to implement a stormwater resource plan. As mentioned above, priority is given to project that reduce bacterial contamination on public beaches. An even higher priority is given to projects addressing bacteria on beaches that have a low grade on the Heal the Bay Report Card (http://brc.healthebay.org).
LAR UR2 WMA Potential Uses	➢ Stormwater Program	➢ Stormwater Program	➢ Regional BMP Projects ➢ Distributed BMP Projects (If a link between clean beaches can be made)
Contact Information	CARE Program USEPA (8001A) 1200 Pennsylvania Avenue, NW Washington, DC 20460 (877) CARE-909	Jessica Counts-Arnold USEPA Region 9 75 Hawthorne Street (WST-7) San Francisco, CA 94105 (415) 972-3288 Counts-arnold.jessica@epa.gov	Patricia Leary Senior Water Resources Control Engineer Division of Financial Assistance (916) 341-5167 pleary@waterboards.ca.gov

Table I-1 Potential Grant Programs to Fund LAR UR2 WMA WMP Implementation			
Grant Program	**Urban Waters Small Grant**	**Environmental Education Grant and SubGrant**	**Cooperative Watershed Management Plan**
Department	USEPA	USEPA	United States Department of the Interior Bureau of Reclamation
Purpose	Fund projects that will foster a comprehensive understanding of local urban water issues, identify and address these issues at the local level, and educate and empower the community.	Provide financial support for projects which design, demonstrate or disseminate environmental education practices, methods, or techniques.	Enhance water conservation including alternative uses, improve water quality, improve ecological resiliency of a river or stream, and reduce conflicts over water at the watershed level by supporting the formation of watershed groups.
Eligibility Requirements	Educational institutions, Indian tribes, local governments, non-profit groups, schools, governments, state/territorial agency, and Tribal agencies.	Local, Tribal, or state education agencies, colleges and universities, state environmental agencies, and non-commercial educational broadcasting agencies.	Existing or proposed watershed groups, states, and local districts.
Eligible Uses	Fund research, investigations, experiments, training, surveys, studies, and demonstrations that will advance the restoration of urban waters by improving water quality through activities that also support community revitalization and other local priorities.	Project must address one of the following educational and environmental priority issue. Educational issues: community projects; human health and environment; or career development. Environmental issues: protecting air quality; safety of chemicals; cleaning up our communities; or protecting America's waters.	Activities falling under categories Task Area A and Task Area B described below. Task Area A: establishment of a new watershed group. Task Area B: expansion of an existing watershed group.
Ineligible Uses	Not identified	Not identified	Not identified
Funding Limits	Approximately $1.6 million annually, $40,000-$60,000 each	➢ Approximately $2,778,940 available annually ➢ Each grant between $75,000-$200,000 ➢ 2-3 grants awarded to each region for an expected 22-32 grants total	Typically $22,000-$100,000 each and an annual total of about $200,000
Terms/Dates	The 2013/14 application period is closed and the 2014/15 not announced.	Applications accepted annually. Expect solicitation for 2015 funding near the end of 2014 and applications due January 2015.	Schedule for 2014 and future funding is currently under development.
Website	http://www2.epa.gov/urbanwaters/urban-waters-small-grants	http://www2.epa.gov/education/environmental-education-ee-grants	http://www.usbr.gov/WaterSMART/cwmp/index.html
Examples	➢ California Coastal Commission in Santa Cruz County (see below) ➢ Council for Watershed Health (see below)	➢ Bay institute of San Francisco for a watershed restoration educational program ➢ San Joaquin for an Adopt-a-Watershed training for teachers ➢ Santa Monica Baykeeper for a variety of stormwater pollution prevention education	➢ Western Slope Conservation Center in Colorado (see below) ➢ Friends of Teton River, Inc. in Idaho (see below)
Comments	During the 2011/12 funding cycle, the California Coastal Commission in Santa Cruz County received funding for a project that will reduce specific urban sources of water quality impacts in two target watershed areas by implementing structural and non-structural control measures. The Council for Watershed Health also received funding to develop a Los Angeles River Watershed assessment framework and then disseminate the results to the community via multi-media outlets. LAR UR2 WMA may be able to take advantage of funding through this grant depending on the requirements set forth during the application year. These funds could be used to fund various MCM programs, other institutional BMP control measures, and distributed structural BMPs.	Various environmental educational programs within California have received funding through this grant program dating back as far as 1992. LAR UR2 WMA may be able to utilize this grant opportunity for funding any stormwater pollution prevention educational programs, including various MCM program elements.	Five entities received funding in 2013 to establish or expand watershed groups in Colorado, Idaho, and Oregon. The Western Slope Conservation Center in Colorado was an established watershed group that will use the funding to address exceedances in E. coli and selenium. The Friends of Teton River, Inc. in Idaho used the grant money to expand their current watershed group to form an advisory council to prioritize and endorse various projects. The Cooperative Watershed Management Program grant is applicable to LAR UR2 WMA and could be used to expand or implement projects or programs associated with the group.
LAR UR2 WMA Potential Uses	➢ Stormwater Program	➢ Stormwater Program	➢ Stormwater Program ➢ Regional BMP Projects ➢ Distributed BMP Projects (as long as the group applies for the grant opposed to individual agencies)
Contact Information	Jared Vollmer USEPA Region 9 (WTR-3) 75 Hawthorne Street San Francisco, CA 94105 (415) 972-3447 Vollmer.jared@epa.gov	Adrienne Priselac USEPA Region 9 Environmental Education (CED-4) 75 Hawthorne Street San Francisco, CA 94105 Priselac.adrienne@epa.gov	Dean Marrone (303) 445-3577 www.usbr.gov/WaterSMART

Table I-1 Potential Grant Programs to Fund LAR UR2 WMA WMP Implementation			
Grant Program	**State of California Coastal Conservancy Program**	**Wildlife Conservation Board (WCB)**	**Habitat Conservation Fund (HCF)**
Department	State of California Coastal Conservancy	State of California Wildlife Conservation Board	State of California Department of Parks and Recreation
Purpose	Projects that protect and improve coastal wetlands, streams, and watersheds; work with local communities to revitalize urban waterfronts; and helps to solve complex land use problems.	Projects that are applicable to the following WCB program, riparian habitat conservation, inland wetlands conservation, ecosystem restoration or agricultural lands, and habitat enhancement and restoration.	Projects that protect threatened species, address wildlife corridors, create trails, and provide nature interpretation programs.
Eligibility Requirements	Government agencies and non-profit organizations	Government agencies, state departments, federal agencies, and non-profit organizations	Cities, counties, and districts
Eligible Uses	Goals and projects that meet the objectives in the Conservancy's Strategic Plan and consistent with the purposes of the funding source (typically Proposition 84)	Projects that restore and enhance wildlife habitats	Nature interpretation programs to bring urban residents into park and wildlife areas, protection of various plant and animal species, and acquisition and development of wildlife corridors and trails.
Ineligible Uses	Not identified	Not identified	Not identified
Funding Limits	No established minimum or maximum grant amount	No established minimum or maximum grant amount	➢ $2,000,000 funded annually through 2019-2020 Fiscal Year ➢ 50 percent match required from grantees
Terms/Dates	Proposals are accepted on a continuous basis. Periodically grant rounds will be advertised and applications will be accepted for projects of a particular type or a particular location.	Proposals are accepted on a continuous basis. WCB meets four times per year, typically in February, May, August, and November.	Applications are due the first workday in October each year.
Website	http://scc.ca.gov/applying-for-grants-and-assistance/forms/	www.wcb.ca.gov/Programs.aspx	http://www.parks.ca.gov/?Page_id=21361
Examples	➢ Los Cerritos Wetlands Authority (see below) ➢ Mountains Recreation and Conservation Authority (see below) ➢ Ballona Creek Wetlands Ecological Reserve (see below)	➢ Malibu Lagoon State Park Coastal Restoration Project ➢ Moss Landing Wildlife Area Wetland Restoration Project	Projects identified on the 2013-14 HCF recommended projects list: ➢ City of Pasadena's Arroyo Seco Adventure Camp ➢ County of Los Angeles Golden Braille Trail Project ➢ County of Los Angeles Placerita Canyon Riparian Habitat Preserve/Restoration Project
Comments	Various projects within southern California have received funding through the Coastal Conservancy Grant Program. In 2011, $225,000 was provided to the Los Cerritos Wetlands Authority to prepare a comprehensive conceptual restoration plan for the Los Cerritos wetlands complex in the Cities of Long Beach and Seal Beach near the mouth of the San Gabriel River. $500,000 was awarded to the Mountains Recreation and Conservation Authority for the design and construction of the Compton Creek Nature Park and $280,000 was provided for site improvements and planning to provide for public access, community stewardship, and educational programs at the Ballona Wetlands Ecological Reserve. This grant program may be applicable to LAR UR2 WMA for different types of control measures.	Various projects within California have received funding through this grant program. Projects that may be authorized as inland wetland conservation projects incorporate elements such as the construction of swales, installation of water control structures, and the establishment of upland grasslands. LAR UR2 WMA may be able to benefit from the WCB Grant Program if the projects identified through the WMP development pertain to wetlands or habitat enhancements. It may be easy `to add elements to potential projects so that the project qualifies for funding while also incorporating water quality improvement elements.	The HCF has opportunities annually that the LAR UR2 WMA may be able to benefit from if selected projects concern a wildlife aspect. In some cases, projects can be modified to incorporate additional elements to address water quality. Multi-use projects may qualify for funding through this grant.
LAR UR2 WMA Potential Uses	No projects apply at this time	No projects apply at this time	No projects apply at this time
Contact Information	South Coast: Ventura County to San Diego County Joan Cardellino (510) 286-4093 jcard@scc.ca.gov	Dave Means Assistant Executive Director Dave.means@wildlife.ca.gov www.wcb.ca.gov/Programs.aspx	California State Parks Office of Grants & Local Services P.O. Box 942896 Sacramento, CA 94296 (916) 653-7423 localservices@parks.ca.gov

Table I-1 Potential Grant Programs to Fund LAR UR2 WMA WMP Implementation

Grant Program	Land and Water Conservation Fund (LWCF)	Recreational Trails Program (RTP)	TIGER Discretionary Grant
Department	State of California Department of Parks and Recreation	State of California Department of Parks and Recreation	Department of Transportation (DOT)
Purpose	Projects that protect threatened species, address wildlife corridors, create trails, and provide nature interpretation programs.	Provides funding for recreational trails and trails-related projects.	Provides funding for road, rail, transit, and port projects that will deliver long-term outcomes of safety, economic competitiveness, state of good repair, livability, and environmental sustainability.
Eligibility Requirements	Cities, counties, Native American tribes, joint power authorities, and non-state agency recreation and park districts	Cities, counties, districts, state agencies, federal agencies, and non-profit organizations	State, local, and tribal governments, including United States territories, transit agencies, port authorities, metropolitan planning organizations, other political subdivisions of state or local governments, and multi-state or multi-jurisdictional groups applying through a single lead applicant.
Eligible Uses	Projects that are associated with parks which promote children play, exercise, family bonding, senior socializing, connections with nature, and cultural differences.	Non-motorized and motorized projects that involve acquisitions for trails, trail rehabilitation, and construction of new trails.	Based on the Consolidated Appropriations Act, 2014 (Public Law No. 113-76)
Ineligible Uses	Not identified	See application guidelines	Not identified
Funding Limits	➢ $2,000,000 is the maximum grant request which cannot exceed 50 percent of total project cost ➢ This is a reimbursement-only program	➢ No minimum or maximum amount specified ➢ The maximum amount of funds allowed for each project is 88 percent, requiring a minimum of 12 percent match	$600 million to be awarded for National Infrastructure Investments
Terms/Dates	Applications are due February 3rd of every year	Current funding source expires September 30, 2014 and additional dates cannot be identified until new authorizations are finalized.	Grant applications must be submitted by April 28, 2014. Future opportunities are unknown at this time.
Website	http://www.parks.ca.gov/?Page_id=21360	http://www.parks.ca.gov/?Page_id=24324	http://www.dot.gov/tiger
Examples	➢ City of Covina's City Center Park ➢ Los Angeles County Cold Creek High Trail ➢ City of El Monte's Rio Hondo River Park	➢ City of Los Angeles' Peck Bandini ➢ City of Diamond Bar's Sycamore Canyon Park ➢ City of Gendale's San Rafael Hills "Mountain Do" Trail	➢ Crenshaw/Los Angeles Airport Light Rail Connection ➢ Port of Long Beach Rail Realignment ➢ Port of Los Angeles West Basin Rail Yard
Comments	Types of projects eligible: ➢ Athletic fields and courts ➢ Community gardens ➢ Non-motorized neighborhood and regional recreational trails ➢ Open space and natural areas ➢ Picnic areas ➢ Play grounds LAR UR2 WMA may be able to take advantage of this funding opportunity if the proposed projects are related to parks. It may be easy to add elements to potential projects so that the project qualifies for funding while also incorporating water quality improvement elements.	LAR UR2 WMA may be able to take advantage of this funding opportunity if the proposed projects are related to trails. It may be easy to add elements to potential projects so that the project qualifies for funding while also incorporating water quality improvement elements.	According to the March 24, 2014 CASQA bi-weekly newsletter, the notice for available funding provides guidance on selection criteria and application requirements for the National Infrastructure Investments. The legislation includes substantial language including funding for "addressing stormwater through natural means", "groundwater recharge in areas of water scarcity", and "stormwater mitigation", therefore stormwater projects may be eligible for funding. LAR UR2 WMA may be able to receive funding from this program now or in the future in order to assist in projects that incorporate both a transportation and water quality aspect.
LAR UR2 WMA Potential Uses	➢ Regional BMP Projects (with park elements)	➢ Regional BMP Projects (with trail elements)	➢ Regional BMP Projects ➢ Distributed BMP Projects (related to transportation)
Contact Information	California State Parks Office of Grants & Local Services P.O. Box 942896 Sacramento, CA 94296 (916) 653-7423 localservices@parks.ca.gov	California State Parks Office of Grants & Local Services P.O. Box 942896 Sacramento, CA 94296 (916) 653-7423 localservices@parks.ca.gov	Office of Infrastructure Finance and Innovation -Office of the Secretary of Transportation 1200 New Jersey Avenue, SE Washington, DC 20590 (202) 366-0301 TIGERgrants@dot.gov

Table I-1 Potential Grant Programs to Fund LAR UR2 WMA WMP Implementation			
Grant Program	**Environmental Solutions for Communities**	**Clean Water Act (CWA) §319(h) Non-Point Source (NPS)**	**Potential 2014 Water Bond**
Department	Wells Fargo and the National Fish and Wildlife Foundation	CWA	State of California
Purpose	Support projects that link economic development and community well-being to the stewardship and health of the environment.	Support implementation and planning projects that address water quality problems in surface and ground water resulting from NPS. The goal of these projects is to eventually restore the impacted beneficial uses in receiving waters.	Provide funding for projects that ensure reliable water supply for future generations.
Eligibility Requirements	Community/watershed groups, cooperative associations or districts, local governments, state/territorial agencies, and non-profit groups.	The projects must be located within watersheds that has a TMDL with constituents identified in the NPS Program Preferences. The project must also be located in a watershed that has a plan or suite of plans that meet the Nine Key Elements found in Appendix A of the grant guidelines. Lastly the project cannot be located in an area subject to an NPDES Permit.	Unclear at this time.
Eligible Uses	Funding priorities include: supporting sustainable agricultural practices and private lands stewardship; conserving critical land and water resources and improving local water quality; restoring and managing natural habitat, species, and ecosystems that are important to community livelihood; facilitating investments in green infrastructure, renewable energy and energy efficiency; and encouraging broad-based citizen participation in project implementation.	Projects that address TMDLs associated with NPS.	Provide funding for projects must address water storage capacity, recycling facilities, levee improvements, flood control facilities, water treatment plants, ecosystem restoration, and habitat improvements.
Ineligible Uses	Not identified	Projects in areas that are under or affiliated with a NPDES Permit or address an issue in a land use included in a MS4 Permit	Unclear at this time.
Funding Limits	➢ Approximately $3,000,000 annually, between $25,000-$100,000 each ➢ 1:1 match required	➢ Funding allocation for entire program is $4,000,000 ➢ Provide the minimum match funding of 25 percent of the total project cost	Unclear at this time, but budget may include $4 billion for local resources development, $4 billion for ecosystem restoration, and $3 billion for public benefits associated with groundwater storage.
Terms/Dates	Applications accepted in December annually until 2016.	Annual solicitations (2014 solicitations were required by January 2014)	On the 2014 California ballot.
Website	http://www.nfwf.org/environmentalsolutions/Pages/home.aspx	http://www.waterboards.ca.gov/water_issues/programs/nps/grant_program.shtml#eligible	http://www.acwa.com/spotlight/2014-water-bond
Examples	➢ Newark Urban Tree and Urban Farm Project ➢ Removing Blight to Restore the Bay and Create Jobs Project ➢ Greening Art Alley: Pedestrian Corridor/Urban Renewal Project	➢ San Diego County Nutrient Source Reduction Program in Rainbow Creek Watershed ➢ Desert Wildlife Unlimited Alamo River Treatment Wetlands at Shank Road	Not Applicable
Comments	The Urban Tree and Urban Farm Project established tree and urban farms in Newark to reduce the carbon footprint, improve stormwater management, and provide job training opportunities for the youth. Removing Blight to Restore the Bay and Create Jobs Project that deconstructed 56 vacant homes in Baltimore Harbor Watershed and replaced them with permanent green space to treat stormwater and create jobs in the local community. The Greening Art Alley: Pedestrian Corridor/Urban Renewal Project installed rain gardens and other green infrastructure techniques in a local pedestrian facility to improve stormwater management and increase community engagement with natural habitats.	LAR UR2 WMA will not be able to benefit from this grant program because the receiving waterbodies associated with the group are not identified on the NPS Program Preferences. In addition, the projects the LAR UR2 WMA would be interested in implementing would be in areas covered by an NPDES Permit and therefore would not quality.	The 2014 Water Bond is the product of a comprehensive legislative package developed in 2009 by Governor Schwarzenegger and state lawmakers to meet California's growing water challenges. This package represented a major step toward ensuring reliable water supply for future generations as well as restoring the Sacramento-San Joaquin Delta and other ecologically sensitive areas. The progression of this bond will be tracked in the future in order to determine if funding opportunities exist for LAR UR2 WMA.
LAR UR2 WMA Potential Uses	➢ Regional BMP Projects ➢ Distributed BMP Projects	➢ XXX	Unclear at this time.
Contact Information	National Fish and Wildlife Foundation Carrie Clingan (202) 595-2471 Carrie.Clingan@nfwf.org	For CWA §319(h) Grant Program: Division of Water Quality Matthew Freese (916) 341-5485 Matthew.Freese@waterboards.ca.gov For FAAST: Patricia Leary (916) 341-5167 Patricia.Leary@waterboards.ca.gov	Timothy Quinn Association of California Water Agencies (CWA) Executive Director (916)441-4545 Timq@acwa.com

Table I-2 Potential Loan Programs to Fund LAR UR2 WMA WMP Implementation

Loan Program	Clean Water State Revolving Fund (CWSRF)	Financial Incentives for Recycled Water Projects to Provide Drought Relief	Infrastructure State Revolving Fund (ISRF)
Department	SWRCB	SWRCB	California Infrastructure and Economic Development Bank
Purpose	Provide funding for publically-owned facilities	Provide funding for recycled water projects that would be completed within three years of the Governor's January 17, 2014 drought declaration.	Provide financing for public infrastructure projects.
Eligibility Requirements	Public agencies and nonprofit organizations	See CWSRF. This program is has new low interest financing terms, funded through CWSRF.	Applicant must be a local municipal entity Project must promote economic development and attract, create, and sustain long-term employment opportunities
Eligible Uses	Stormwater treatment and diversions, sediment and erosion control, stream restoration, and land acquisitions.	Construct or modify public infrastructure, purchase and install pollution control or noise abatement equipment, or acquire land. Project must meet tax-exempt financing criteria.	Construct or modify public infrastructure, purchase and install pollution control or noise abatement equipment, or acquire land. Project must meet tax-exempt financing criteria.
Ineligible Uses	Operation and maintenance activities, legal fees	Privately owned facilities or debt refinancing	Privately owned facilities or debt refinancing
Funding Limits	$50,000,000 per agency per year	$800 million total in one percent loans	➢ $2,000,000 maximum per environmental mitigation project per fiscal year ➢ $10,000,000 maximum per project for all other purposes per fiscal year ➢ $20,000,000 per jurisdiction per fiscal year
Terms/Dates	➢ Interest rate is one-half general obligation bond rate. ➢ Repayment term of twenty years ➢ Applications accepted continuously	Open application process until December 2, 2015	➢ Maximum 30 year term and open application process ➢ Preliminary application available at www.ibank.ca.gov
Website	http://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.shtml	http://www.waterboards.ca.gov/press_room/press_releases/2014/pr031914.pdf	http://ibank.ca.gov/infrastructure_loans.htm
Examples	➢ City of Anaheim Sewer Reconstruction Project ➢ Eastern Municipal Water District Recycled Water Pond Expansion and Optimization Project	Program just began therefore no example projects at this time.	➢ City of Paramount Water Well #15 Construction Project ➢ City of Monterey Park Water Main Replacement Project ➢ Lawndale Redevelopment Agency Hawthorne Boulevard Revitalization Project ➢ City of Lawndale Charles B. Hopper Park Project
Comments	Other project types that are considered under this financing program include: ➢ Construction of publicly-owned facilities: ▪ Wastewater treatment ▪ Local sewers ▪ Sewer interceptors ▪ Water reclamation facilities ▪ Stormwater treatment ➢ Expanded Use projects include, but are not limited to: ▪ Implementation of nonpoint source projects or programs ▪ Development and implementation of estuary comprehensive conservation and management plan Expanded Use project include, but are not limited to NPS projects/programs and estuary comprehensive conservation and management plan.	This program provides low-cost, long-term financing to local governments for water recycling projects. Water recycling is the use of treated municipal wastewater for beneficial purposes such as agricultural and landscape irrigation, industrial processes, and replenishment of groundwater basins. Amount the projects that will be eligible for funding are recycled water treatment, distribution, and storage facilities.	This program provides low-cost, long-term financing to local governments for a variety of public infrastructure projects. A lot of the eligible project categories are not applicable to the LAR UR2 WMA in terms of using this funding to implement stormwater compliance measures, but the following project categories would be applicable to LAR UR2 WMA: ➢ Drainage, water supply, and flood control ➢ Environmental mitigation measures ➢ Parks and recreation facilities. It may be easy to add water quality elements to potential infrastructure projects so that the project qualifies for funding while also incorporating water quality improvement elements.
LAR UR2 WMA Potential Uses	➢ Regional BMP Projects ➢ Distributed BMP Projects	➢ Regional BMP Projects ➢ Distributed BMP Projects	➢ Regional BMP Projects ➢ Distributed BMP Projects
Contact Information	(916) 327-9978 CleanWaterSRF@waterboards.ca.gov	Kathie Smith (916) 341-5263	Ruben Rojas, Deputy Executive Director 980 9th Street, 9th floor Sacramento, CA 95814 (916) 539-4408 Ruben.Rojas@ibank.ca.gov (OR) Marilyn Muñoz, General Counsel Same address (916) 324-1299 Marilyn.Munoz@ibank.ca.gov