LOS CERRITOS CHANNEL
WATERSHED GROUP

Los Cerritos Channel
Watershed Management Program

Bellflower Cerritos Downey Lakewood Long Beach Paramount Signal Hill Los Angeles County Flood Control District

We Serve to Protect our Coastal Waters

Prepared by: RWA RICHARD WATSON & ASSOCIATES, INC.
Stormwater Quality Planning

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BMPs – Best Management Practices

CALTRANS – California Department of Transportation

CASQA – California Stormwater Quality Association

CIMP – Coordinated Integrated Monitoring Plan

DEHP - Bis (2-ethylhexyl)phthalate

EWMP – Enhanced Watershed Management Program

Long Beach Permit - Order No. R4-2014-0024 (NPDES Permit No. CAS004003, *Waste Discharge Requirements for Municipal Separate Storm Sewer System Discharges from the City of Long Beach)*

Los Angeles Permit - Order No. R4-2012-0175 (NPDES Permit No. CAS004001, *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 MS4)*

LCC – Los Cerritos Channel

MCMs – Minimum Control Measures

MEP – Maximum Extent Practicable

NPDES – National Pollutant Discharge Elimination System

RWL – Receiving Water Limitations

Regional Water Board – Los Angeles Regional Water Quality Control Board

TAC – Technical Advisory Committee

TMDL – Total Maximum Daily Load

TSS – Total Suspended Solids

WAGs – Watershed Authority Groups

Watershed Group – Los Cerritos Channel Watershed Group

WMP – Watershed Management Program

WQP – Water Quality Priority

WQBELs – Water Quality Based Effluent Limitations

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Executive Summary

The Permittees of the Los Cerritos Channel (LCC) Freshwater Watershed (Watershed), a portion of the Los Cerritos Channel and Alamitos Bay Watershed Management Area, have developed this Watershed Management Program (WMP) as specified in Order R4-2012-0175. This WMP sets forth a plan to achieve pollutant reductions in the waterbodies of the LCC Watershed. It serves as the Implementation Plan for the Los Cerritos Channel Metals TMDLs. The associated Coordinated Integrated Monitoring Plan (CIMP) serves as the Coordinated Monitoring Plan for the Metals TMDL. In addition to the CIMP, the WMP is accompanied by a reasonable assurance analysis (RAA) based upon the Watershed Management Modeling System previously developed by the Los Angeles County Flood Control District (LACFCD) in collaboration with USEPA. The WMP is a long-term planning document that takes a comprehensive look at the LCC Watershed, including land uses, the municipal separate storm sewer system (MS4), existing and planned control measures, and historical monitoring data. It lays the groundwork for expanding upon Permittees' existing water quality management programs and provides the flexibility necessary to allow the Permittees to respond to new issues or concerns that might arise in the course of routine monitoring or as the result of emerging topics in stormwater science.

The LCC Permittees began working together to address water quality in late 2008 by forming a Technical Committee in response to a draft of the EPA-established Metals TMDLs for the LCC Watershed. The Group, now known as the Los Cerritos Channel Watershed Group, is comprised of the Cities of Bellflower, Cerritos, Downey, Lakewood, Long Beach, Paramount, and Signal Hill, as well as the Los Angeles County Flood Control District and, informally, the California Department of Transportation (Caltrans). The Group originally entered into Memoranda of Agreement (MOAs) in 2010, with the Gateway Water Management Authority (GWMA) acting as fiduciary agent. The Group is covered by the Los Angeles County MS4 Permit (Order No. R4-2012-0175, adopted November 8, 2012), except for the City of Long Beach, which is covered by the City of Long Beach MS4 Permit (NPDES Permit Order No. R4-2014-0024, adopted February 6, 2014). Both Permits are on five-year renewal cycles. Caltrans is regulated by a separate statewide permit, which was adopted September 19, 2012 and became effective on July 1, 2013. It too is on a five-year cycle. Since the adoption of the new Los Angeles MS4 Permit, the Watershed Group has worked to analyze the range of stormwater management alternatives contained in the Permit for addressing targeted stormwater pollutants in the Los Cerritos Channel.

The Los Cerritos Channel Watershed Group has considered how best to develop a WMP to implement the requirements of the Permits on a watershed scale through each Permittee's stormwater management program and through customized strategies, control measures, and best management practices (BMPs). The Watershed Group has revisited strategies, control measures, and BMPs and concludes that addressing water quality impairments within the Watershed should be based on a multi-faceted approach, initially focused on source control, runoff reduction, and total suspended solids (TSS) reduction. Members of the Watershed Group have been particularly focused on true source control (pollution prevention) because major sources of copper, lead, and zinc are released into the atmosphere, which results in widespread deposition on impervious surfaces such as streets, highways, parking lots, and rooftops. In

addition, these metals are directly deposited onto roadways and other surfaces from motor vehicle components such as brakes, wheel weights, and tires. In addition, the Watershed Group's strategy includes low impact development (LID) and green streets, operational source control methods (including enhanced street sweeping), and capture and infiltration and/or capture and use of stormwater, with treatment controls considered the method of last resort, since they are the least effective and most costly water quality improvement methods.

Each of the Cities in the Watershed Group contributed either directly or indirectly to efforts by the California Stormwater Quality Association (CASQA) and Sustainable Conservation to develop and negotiate SB 346 – the passage of which is a milestone that will significantly reduce the level of copper in metropolitan area waters throughout the state through reduction of copper in vehicle brake pads. Members of the Watershed Group look forward to working with CASQA next to address zinc in vehicle tires. The Department of Toxic Substances Control (DTSC) has newly adopted Safer Consumer Product Regulations that will be a future method by which zinc in tires could potentially be addressed. These two true source control efforts will address two of the Watershed's major pollutants of concern. Although, due to the DTSC's schedule for addressing pollutants, it will be a few years before the Watershed Group would be able to address zinc through the Safer Consumer Product Regulations, Group Members can work in the interim to gain support for including zinc in DTSC's list of pollutants of concern on a future list. Group Members will also work to address local sources of zinc.

The Los Cerritos Channel Metals TMDLs established waste load allocations (WLAs) for copper, lead, and zinc during wet weather and copper during dry weather. Total lead limits were based upon maintenance of historical concentrations, and total lead concentrations and loads remain in compliance with the TMDL limits. Elevated concentrations of total recoverable aluminum, copper, lead, and zinc are commonly associated with elevated sediment concentrations during storm events. Aluminum is expected to be elevated during storm events due to its natural abundance in soils and is not considered to be a major pollutant of concern. Concentrations of dissolved copper and zinc commonly exceed freshwater quality criteria during storm events, and are the two metals of primary concern. The Watershed Group expects to see reductions in copper loading soon, due to implementation of SB 346. Brake pad manufacturers have already begun to significantly reduce the amount of copper in vehicle brake pads.

Los Cerritos Channel Watershed Group Permittees are fortunate to have 13 years of data already collected by the City of Long Beach at its Stearns Street mass emission monitoring site. Major elements incorporated in Long Beach's monitoring and reporting program include, 1) mass emission monitoring during storm events, 2) monitoring of dry-weather discharges at each mass emission site, and 3) special studies. Data from the Long Beach monitoring program is intended to support decisions needed to refine BMPs for the reduction of pollutant loading and the protection and enhancement of beneficial use of the receiving waters.

The Long Beach mass emission monitoring program is intended to characterize stormwater discharges, identify contaminants of concern and develop pollutant load estimates for each major watershed. Flow-rated, whole storm composite samples are obtained and analyzed for major constituents of concern that include conventional constituents, total and dissolved metals, organochlorine pesticides, and organophosphate pesticides. For the past two years, this has also included pyrethroid pesticides, and, for the past year, Fipronil. Trends over the past 10 years

have been examined for principal contaminants of concern. Concentrations of contaminants measured in both wet- and dry-weather discharges are compared with various receiving water quality criteria. For purposes of analysis, water quality criteria or objectives were used to provide reference points for assessing the relative importance of various stormwater contaminants, although specific receiving water studies are necessary to quantify the presence and magnitude of any actual water quality impacts.

Part VI.C.5.a of the Los Angeles MS4 Permit requires Permittees to identify the water quality priorities within each Watershed Management Area (WMA) that will be addressed by a WMP. It further requires Permittees to designate three categories of priority pollutants that will be addressed: Category 1 (Highest Priority), Category 2 (High Priority), and Category 3 (Medium Priority). Highest Priority pollutants are those for which water quality-based effluent limitations and/or receiving water limitations are established in the Order. High Priority are those pollutants for which water quality data indicate a water quality impairment in the receiving water according to the California's Clean Water Act (CWA) Section 303(d) List for which MS4 discharges may be causing or contributing to the impairment, but which are not being addressed through TMDLs. The third category is not as clear-cut. It is defined to include pollutants for which there are insufficient data to indicate water quality impairment, but which exceed applicable receiving water limitations. This LCC WMP identifies Category 1 and Category 2 pollutants, and proposes a screening process to separate medium priority (Category 3) pollutants from those the Watershed Group considers to be low priority at this time.

In implementing this WMP, the Watershed Group will select control measures that will facilitate cost-effective implementation of the Water Quality Improvement Strategy specified in Section 3 of this Program. Section 4 of the Program includes a summary of the assessment of each minimum control measure (MCM) program, as well as a determination as to whether the Permittees will implement the MCM provisions as explicitly stated or with modifications to focus on specific water quality problems. Information on how compliance with receiving water limitations can be achieved through stormwater capture is in Section 5 of this WMP, with further details in the RAA that was prepared collectively for three watersheds – the LCC, Lower Los Angeles River, and Lower San Gabriel River Watersheds – because several cities are in two or three of these watersheds and the cities wanted consistency within the jurisdictions. The RAA is described in Section 8 and found in Attachment A.

The Watershed Group has begun implementation of the CIMP by conducting three field screenings of non-stormwater outfalls. Full implementation of the CIMP is proposed to commence within 90 days after approval of the CIMP by the Executive Officer of the Regional Board or by July 1, 2015, whichever is later. The schedule provides for commencing monitoring on July 1, 2015 as starting monitoring part way through a complete monitoring year or missing the first storms of the year would not be productive. Formal implementation of the Los Cerritos Channel WMP will begin upon approval of the final Program pursuant to Table 9 of Order No. R4-2012-0175.

The LCC Watershed Group has developed its implementation schedules based on guidance in the Permit that specifies that compliance schedules and interim milestone dates be used to measure progress toward addressing the highest water quality priorities and achieving applicable water quality-based effluent limitations. The schedules in this WMP will allow the

Watershed Group to measure progress on a watershed scale every two years as part of an adaptive management process. Schedules have been initially developed for the strategies, control measures, and BMPs to be implemented on a watershed scale and on municipal roles in planning and implementing these projects (See Section 6 of this WMP). The Watershed Group is emphasizing a watershed approach to addressing water quality problems within the Watershed.

The overall implementation schedule for the LCC WMP is strongly influenced by TMDL final compliance dates and target dates for Category 2 and 3 pollutants, the Watershed Group's Water Quality Improvement Strategy, and the need to establish a stable and sustainable stormwater funding source in Los Angeles County and California to pay for the expensive stormwater capture and stormwater treatment facilities anticipated to be necessary to meet water quality standards in a timely manner. Final wet-weather compliance target dates for Category 1, 2, and 3 pollutants are shown in Section 2 and Section 6 of this Program (see Tables 2-9 through 2-12 and 6-1). Schedules for jurisdictional projects will be added to the schedules during adaptive management review as cities plan and program implementation of green streets, LID, and other local projects. The initial schedule contained in this WMP covers a 26-year period and is structured into eight three-year phases and a two-year phase. The schedule assumes a 2015 start date and is based on an anticipated 5-year permit renewal cycle (see Tables in Section 6 of this Program).

The Los Cerritos Channel Watershed Group looks forward to continuing to work together, and with the Regional Water Board, to achieve pollutant reductions in the waterbodies of the Watershed. Prior to 2012, MS4 permits required cities and agencies to implement a series of BMPs such as street sweeping and catch basin cleaning to demonstrate compliance. With the adoption of the fourth term MS4 permit by the Regional Water Board on November 8, 2012, the emphasis shifted to a watershed-based effort that includes the goals of achieving specific pollutant targets as runoff leaves the storm drain system and enters the Los Cerritos Channel. This Watershed Management Program, together with its accompanying RAA and CIMP, constitutes the first step in that watershed-based effort.

1.0 Introduction and Background

1.1 Introduction

The Los Cerritos Channel (LCC) Watershed (Watershed) is a small, urbanized watershed comprising 17,711 acres in the Los Cerritos Channel and Alamitos Bay Watershed Management Area. The Permittees in the Watershed have been working together since late 2008 to address water quality issues in the Watershed. The Watershed includes the Cities of Bellflower, Cerritos, Downey, Lakewood, Long Beach, Paramount, and Signal Hill, as well as 94 acres of unincorporated land. After formalizing their partnership in 2010, these Permittees came together as the Los Cerritos Channel Technical Committee, and are now known as the Los Cerritos Channel Watershed Group. Since then, the Los Angeles County of Flood Control District (LACFCD) has joined the Watershed Group, and the California Department of Transportation (Caltrans) participates with the Group on an informal basis.

The Los Cerritos Channel Watershed Group has chosen to develop a Watershed Management Program (WMP) as a collaborative effort pursuant to Part VI.C. of Order No. R4-2012-0175 (National Pollutant Discharge Elimination System [NPDES] Permit No. CAS004001, *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 MS4*, or "Los Angeles County Permit") and Part VII.C. of Order No. R4-2014-0024 (NPDES Permit No. CAS004003, *Waste Discharge Requirements for Municipal Separate Storm Sewer System Discharges from the City of Long Beach*, or "Long Beach Permit") to implement the requirements of the Order on a watershed scale through customized strategies and control measures and continued implementation of the applicable minimum control measures (MCMs) specified in Part VI.D. of the Order No. R4-2012-0175 and Part VI. C of Order No. R4-2014-0024. This voluntary approach to compliance with the Order will allow the Permittees the flexibility of addressing the highest watershed priorities first and allow the Permittees to develop a Coordinated Integrated Monitoring Program (CIMP) that matches the unique nature of the Watershed through watershed segmentation and forensic monitoring to locate the primary sources of pollutants within the Watershed. The customized strategies and control measures presented in this Program will be implemented both on a watershed and sub-basin basis and, where applicable, through each Permittee's stormwater management program.

Consistent with the Order, the WMP is designed to ensure that, over time, discharges from the Watershed Group's MS4s will achieve applicable water quality based effluent limitations (WQBELs) in Part VI.E. of the Permit, including the Los Cerritos Channel Metals Total Maximum Daily Loads (TMDLs) (Attachment Q of the Permit) and the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL (Attachment N of the Permit), not cause or contribute to exceedances of receiving water limitations in Parts V.A and VI.E of the Order or the applicable TMDLs, and not include non-stormwater discharges that are effectively prohibited by Part III.A. of the Order. Control measures will be implemented to reduce the discharge of pollutants to the maximum extent practicable. (MEP).

Consistent with Part VI.C.5-C.8, the WMP:

1. Prioritizes water quality issues;
2. Identifies and implements strategies, control measures, and best management practices (BMPs) to achieve required water quality outcomes;
3. Executes an integrated monitoring program and assessment program;
4. Modifies strategies, control measures, and BMPs, as necessary, based on analysis of monitoring data collected, to ensure that applicable water quality-based effluent limitations and receiving water limitations and other milestones set forth in the WMP are achieved in the required timeframes; and
5. During the preparation of this WMP, the Los Cerritos Channel Watershed Group held a joint stakeholder meeting with the Lower San Gabriel River Watershed Committee. The Groups held the joint meeting on April 30 to seek stakeholder input, partially because several cities are in both watersheds and partially because the Regional Water Board's June 2013 Basin Plan Amendment addressed the Metals TMDLs for both watersheds and included a common implementation schedule. The joint presentation included descriptions of the watersheds, the overall approach to the WMPs, water quality priorities, monitoring, the Reasonable Assurance Analysis, strategies, control measures, schedules, priority pollutants, regional projects, and next steps. The presentation was followed by a valuable question and answer session.

Even though the Los Cerritos Watershed Group has chosen to propose a WMP – not an Enhanced Watershed Management Program (EWMP) – it will evaluate opportunities through the adaptive management process for collaboration on multi-benefit regional projects that collectively, wherever feasible, retain all non-stormwater runoff and all stormwater runoff from the 85th percentile 24-hour storm event for the drainage area tributary to the projects while achieving other benefits, such as water supply.

The WMP also addresses compliance with receiving water limitations not otherwise addressed by a TMDL. For pollutants with the same fate and transport mechanisms as pollutants addressed by a specified TMDL, the planned control measures will be designed to address both the TMDL pollutants and the other pollutants identified as having the same fate and transport mechanisms. A major example of this is the total suspended solids (TSS) reduction measures discussed in Section 3.4, which will address metals and legacy organics. In this case, both sets of pollutants are subject to a TMDL, but the TMDLs address different areas and have different compliance dates. The control measures designed to address the TMDL with the earlier compliance date will also reduce the loading of pollutants subject to the TMDL with the later compliance date.

The development of this WMP is based on an assumption that the current requirements will withstand the appeals to the State Water Board and possible litigation. However, the Los Cerritos Watershed Group recognizes that there could be some future changes to the requirements in Order No. R4-2012-0175. For instance, in a letter dated July 8, 2013, the State Water Board invited comments on the following two questions:

1. Is the watershed management program/enhanced watershed management program alternative contained in the Los Angeles MS4 Permit an appropriate approach to revising the receiving water limitations in MS4 permits?
2. If not, what revisions to the watershed management program/enhanced watershed management program alternative of the Los Angeles MS4 Permit would make the approach a viable alternative for receiving water limitations in MS4 permits?

Numerous entities provided comments on WMPs/EWMPs as an alternative approach. Previously, based on comments provided during the public comment period prior to Permit adoption, Los Angeles Regional Water Quality Control Board (Regional Water Board) staff proposed the use of WMPs/EWMPs, and the Regional Water Board members voted unanimously to include them in the Los Angeles MS4 Permit.

Pursuant to 303(d) listings for the Los Cerritos Channel for copper, zinc, and lead, and to a 13-year time schedule imposed by a 1999 Consent Decree between USEPA and local environmental groups (*Heal the Bay, et al v. Browner et al*), USEPA established the Los Cerritos Channel Total Maximum Daily Loads for Metals on March 17, 2010. Since USEPA does not establish implementation plans or implementation schedules for its TMDLs, development of both was necessary for the Los Cerritos Channel. The Regional Water Board agreed to adopt a Basin Plan Amendment including general implementation plans and schedules for the Los Cerritos Channel Metals TMDLs. This WMP will serve as a detailed implementation plan for addressing the Los Cerritos Channel Metals TMDLs. The Basin Plan Amendment was adopted by the Regional Water Board on June 6, 2013. It was approved by the State Water Board on March 4, 2014. It became effective with approval by the Office of Administrative Law on October 13, 2014.

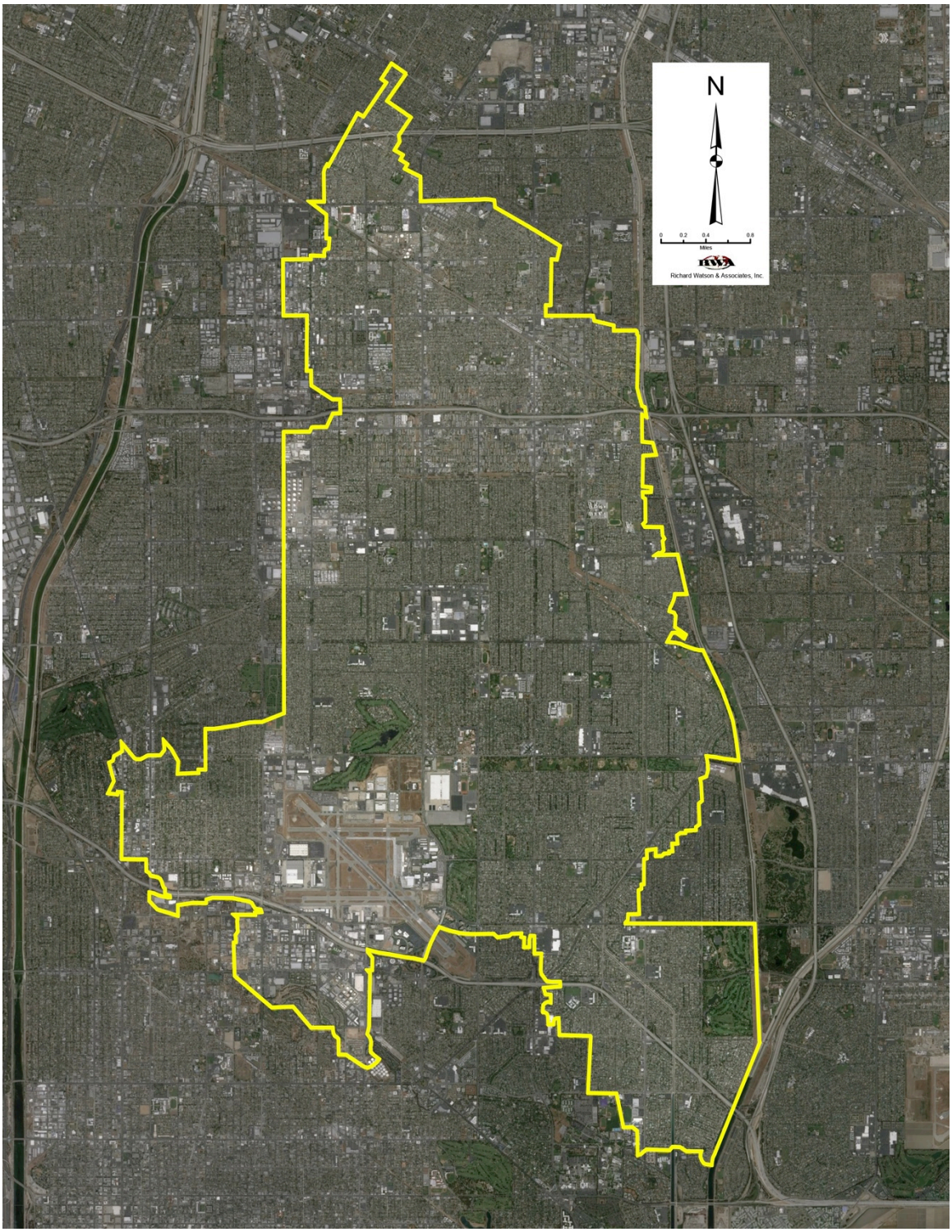
The WMP is a compliance-oriented water quality management tool to be used to facilitate improvement of surface water quality and provide opportunities to increase local water supplies. As stated in the Fact Sheet for the Los Angeles MS4 Permit, "the purpose of Watershed Management Programs is to provide a framework for Watershed Group members to implement the requirements of [permits] in an integrated and collaborative fashion to address water quality priorities on a watershed scale." The program is designed to facilitate watershed-based stormwater management planning using an adaptive management approach that allows for strategic planning and integration of water quality goals with water supply benefits.

Development of a WMP, with its associated monitoring program and Reasonable Assurance Analysis, is expensive, and its implementation will be both costly and rigorous. In acknowledgement of that fact, the Regional Water Board included incentives in the Permit to encourage participation in WMP or EWMP programs. One such incentive is the provision that, through implementation of a WMP, Permittees may comply with receiving water limitations, including water quality based effluent limitations.

1.2 The Watershed

The Los Cerritos Channel Watershed comprises a predominantly urban land area of approximately 17,711 acres (27.7 square miles) (See Figure 1-1).

Figure 1-1. Los Cerritos Channel Watershed



The Watershed extends from just north of I-105 in Downey south to Atherton Street in Long Beach, where the Channel discharges into the Los Cerritos Channel Estuary, which, in turn, discharges through Marine Stadium and Alamitos Bay to San Pedro Bay. The Watershed includes ten MS4 Permittees

regulated under three MS4 permits: the Los Angeles MS4 Permit, the Long Beach MS4 Permit, and the Caltrans Permit. Seven Cities and the Los Angeles County Flood Control District (LACFCD) are participating formally together in development of a WMP and a CIMP. (See Figure 1-2.) The entire Watershed is within the LACFCD. Caltrans is participating informally as of January 2015, since a Memorandum of Understanding (MOU) has not yet been signed. Completion of an MOU and formal participation on the part of Caltrans is anticipated in the future. The total area covered by the WMP includes approximately 17,199 acres. Approximately 498 acres of Caltrans property regulated under a statewide MS4 permit and a 94-acre unincorporated area with a separate WMP are excluded from this WMP. The following table provides a breakdown of the land area within the Los Cerritos Channel Watershed by Permittee.

Table 1-1: Los Cerritos Channel Watershed Land Area by Permittee

Permittee	Land Area (Acres)[1,]	Percentage of Total Area
Bellflower	2,818.4	15.91%
Cerritos	57.6	0.33%
Downey	245.0	1.38%
Lakewood	4,802.7	27.12%
Long Beach	7,535.4	42.55%
Paramount	1,128.9	6.37%
Signal Hill	530.7	3.00%
Caltrans	498.0[1]	2.81%
County FCD	NA[2]	NA
Total:	**17,616.7**	**100%**

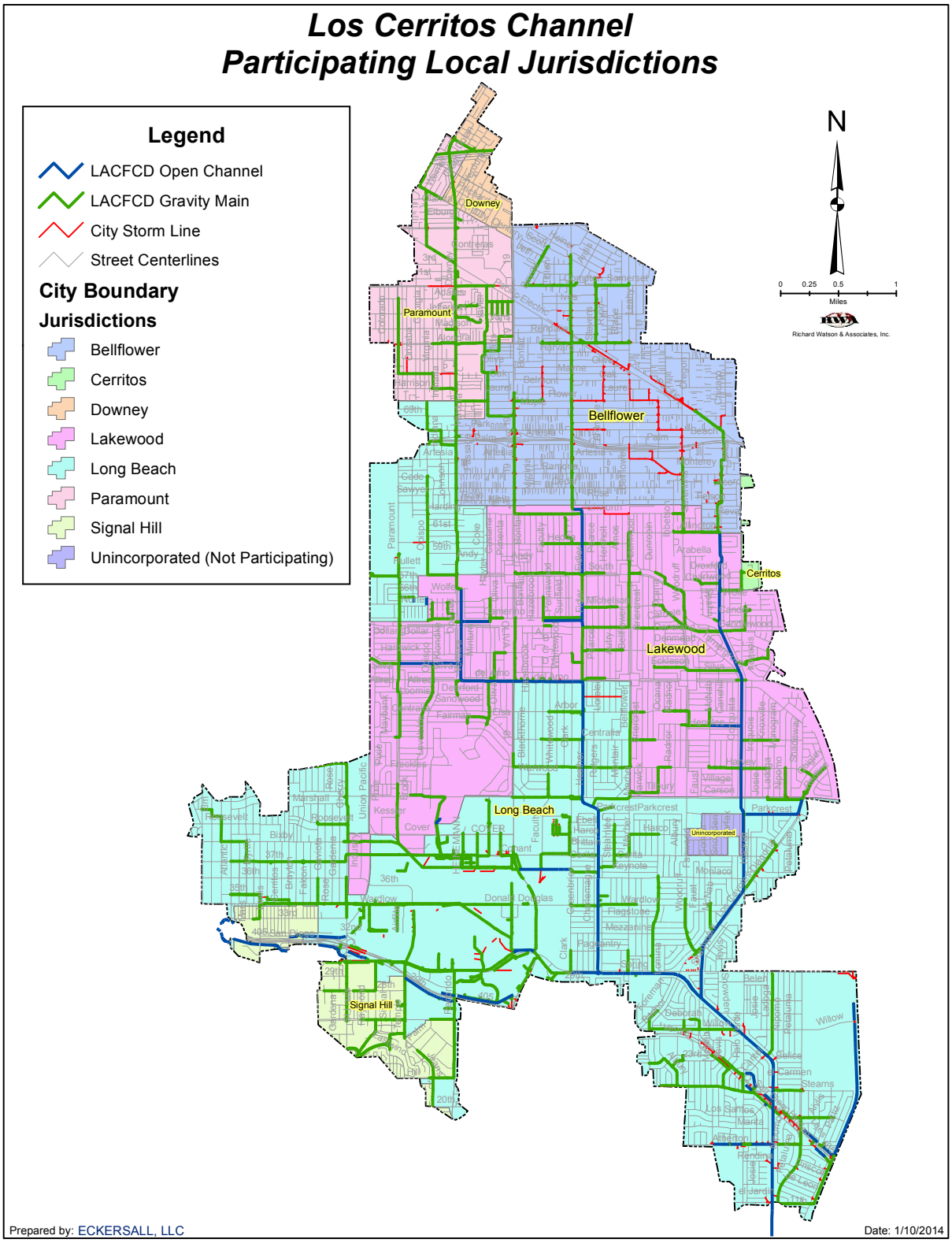
[1] Caltrans average subtracted from city areas.

[2] County of Los Angeles' 94-acre area within the Los Cerritos Channel and Alamitos Bay Watershed Management Area is not included in this WMP.

The County of Los Angeles and the LACFCD have prepared a separate WMP and CIMP for the 94-acre unincorporated area and other LACFCD service areas within portions of the Los Cerritos Channel and Alamitos Bay Watershed Management Area.

The Los Cerritos Channel itself is an open flood control channel. The Cities of Bellflower, Cerritos, Downey, Lakewood, Long Beach, Paramount, and Signal Hill, and a small portion of unincorporated Los Angeles County are located within the area that drains to the Channel. It is a concrete-lined freshwater channel until it reaches approximately Atherton Road, where the Channel's tidal prism begins. A small marina located in the Estuary is used for recreational purposes. Average dry-weather flows in the Channel were 2.35 cubic feet per second (cfs) when the Metals TMDLs were established, with storm event flows recorded as high as a historical maximum of 1,460 cfs. Dry weather flows have subsequently decreased, due in part to the water conservation efforts by cities within the Watershed.

Figure 1-2. Los Cerritos Channel Participating Local Agencies



The portion of the Los Cerritos Channel listed as impaired for metals is the approximately 2.1-mile long freshwater portion above the tidal prism. Approximately 44 percent of the Watershed is located in the eastern part of the City of Long Beach, with the remaining 56 percent located outside the City of Long Beach in the other jurisdictions in the Watershed.

Land use within the Watershed is 93% urban, including approximately 60% residential, 9% mixed urban, 15% commercial, and 9% industrial. Open space accounts for approximately 6% of land use in the Watershed, with agriculture comprising <1% of land use. The following table reproduced from the *Los Cerritos Channel Total Maximum Daily Loads for Metals* illustrates the specific land use percentages in the Watershed:

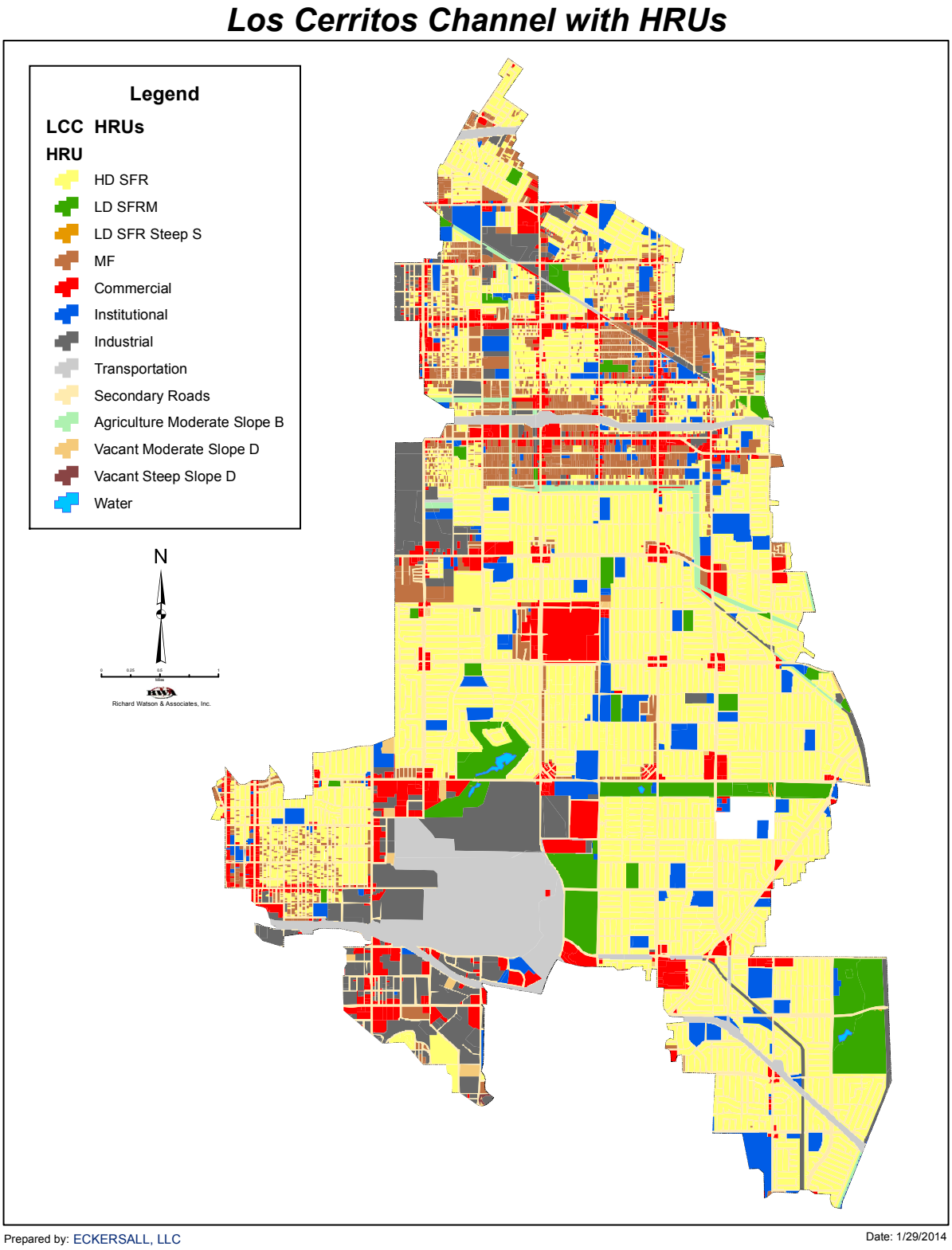
Table 1-2: Los Cerritos Channel Watershed Land Use Percentages

Land Cover Type	No. of Acres[1]	Percentage of Watershed
Agriculture	137.1	0.8%
Commercial	2,668.6	15.1%
High Density Residential	1,228.5	6.9%
Industrial	1,615.0	9.1%
Low Density Residential	9,278.9	52.4%
Mixed Urban	1,665.8	9.4%
Open Space	1,097.9	6.2%
Water	18.9	0.1%
Total	**17,710.7**	**100%**

[1] Includes 94 acres of unincorporated area and 498 acres of Caltrans properties.

These land uses were converted into hydrological response units as part of development of the Watershed Modeling System (WMMS) for the County of Los Angeles. (See Figure 1-3)

Figure 1-3 LCC Hydrologic Response Units



1.3 Water Quality Issues and the History of Water Quality Regulation

The MS4 Permits require Permittees to identify water quality priorities that will be addressed by a WMP. These priorities are to include water quality-based effluent limitations and/or receiving water limitations, as well as an evaluation of existing water quality conditions, including characterization of stormwater and non-stormwater discharges. The Permits further require Permittees to designate three categories of pollutants: Category 1 (Highest Priority), Category 2 (High Priority), and Category 3 (Medium Priority). The requirements for the first two designations are clear in terms of the level of impairment that relates to each. However, the third category, which includes pollutants for which there are insufficient data to indicate water quality impairment, is quite broad and does not distinguish between medium priority and low priority pollutants. In order to identify Category 3 pollutants, the Los Cerritos Channel Watershed Group has developed a screening process to distinguish between medium priority pollutants and those the Group considers to be low priority. See Section 2.2 of this Program for detailed descriptions of the Category 1, 2, and 3 pollutants for the Los Cerritos Channel WMP.

The State of California has established water quality standards based on three components: 1) beneficial uses, as defined by the Regional Water Board in the Basin Plan; 2) narrative and/or numeric water quality objectives; and 3) an antidegradation policy. For certain pollutants, USEPA has established numeric criteria that serve as water quality standards for California's inland surface waters. (California Toxics Rule, 40 CFR 131.38).

In 1990, USEPA established Phase I of the municipal National Pollutant Discharge Elimination System (NPDES) program, which, in part, required operators of medium and large MS4s (generally serving populations of 100,000 or more) to implement stormwater management programs. These programs require addressing a variety of water quality–related issues, including:

- Structural control maintenance
- Areas of significant development or redevelopment
- Roadway runoff management
- Flood control related to water quality issues
- Municipally owned operations such as landfills and wastewater treatment plants
- Municipally owned hazardous waste treatment, storage, or disposal sites
- Application of pesticides, herbicides, and fertilizers
- Illicit discharge detection and elimination
- Regulation of sites classified as associated with industrial activity
- Construction site and post-construction site runoff control
- Public education and outreach

Section 303(d) of the federal Clean Water Act (CWA) requires each State to "identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality objective applicable to such waters." The CWA further requires States to establish priority rankings for waterbody-pollutant combinations on the 303(d) Listing of Impaired Waters, and to establish TMDLs for those waters. A TMDL is defined in the CWA as "the sum of the individual waste

load allocations for point sources and load allocations for nonpoint sources and natural background." The CWA requires TMDLs to be set at levels "necessary to achieve all applicable water quality standards" in the Channel (Source: *Los Cerritos Channel Total Maximum Daily Loads for Metals, March 2010*.) TMDLs also are required to account for seasonal variations and include a margin of safety to account for any lack of knowledge regarding the relationships between effluent limitations and water quality. USEPA included in the Los Cerritos Channel Metals TMDLs an explicit margin of safety equal to 10% of the loading capacity or existing load available for wet-weather allocations.

The State Water Resources Control Board and the nine Regional Water Quality Control Boards are responsible for preparing lists of impaired waterbodies for the 303(d) list and for preparing TMDLs in California. Both processes are subject to USEPA approval. If USEPA does not approve a State-submitted TMDL, it is required to establish a TMDL for that waterbody. The Regional Water Boards are responsible for issuing NPDES permits and state-specified Waste Discharge Requirements.

During the 1996 and 1998 303(d) listing cycles, the Los Angeles Regional Water Board identified over 700 waterbody-pollutant combinations in the region for which TMDLs are required. As a result of a consent decree approved between USEPA, Heal the Bay, and NRDC, a 13-year schedule for development of TMDLs in the Los Angeles region was established on March 22, 1999. The Consent Decree combined the over 700 waterbody-pollutant combinations into 92 TMDL analytical units. Because of the high volume of TMDLs required, which the State was going to be unable to complete and adopt within the 13-year consent decree deadline, USEPA established some of these TMDLs – including those for Analytical Unit 84, which is for metals listings in Los Cerritos Channel.

1.4 History of Water Quality Impairments in Los Cerritos Channel

The Los Cerritos Channel was included on the 1998, 2002, 2006, and 2010 California Clean Water Act Section 303(d) lists as impaired for copper, lead, and zinc. Dry-weather runoff in the Los Cerritos Channel comes largely from groundwater inflow and discharges to the MS4s from illicit connections, excess irrigation, and other residential and commercial practices. Wet-weather metals sources are generally associated with the accumulation and wash-off of metals on the land surface. The volume of wet-weather loading varies with storm size.

In addition to the metals impairments for which TMDLs have been established, the Channel has been listed through the years as impaired for aluminum, bis(2-ethylhexyl)phthalate, coliform bacteria, trash, and pH, although none of these impairments are currently subject to TMDL requirements. Also, the Watershed was included in the nearshore area for the Greater Harbor Toxics TMDLs, which lists impairments for copper, lead, zinc, DDT (fish tissue), PCBs (fish tissue), chlordane (fish tissue), PAHs (fish tissue), and toxicity (sediment). See Section 2.0 for a detailed discussion of water quality issues within the Watershed and the priority pollutants to be addressed through implementation of this WMP.

At the time the Metals TMDLs were adopted in 2010, there were 68 NPDES permittees in the Los Cerritos Channel Watershed, including MS4 permits, the Caltrans permit, general construction and general industrial stormwater permits, those regulated under minor NPDES permits, and general NPDES

permits. Individual metals sources in the watershed include vehicle brake pads, vehicle tire wear, building materials, pesticides, erosion of paint, and aerial deposition of emissions from industrial facilities.

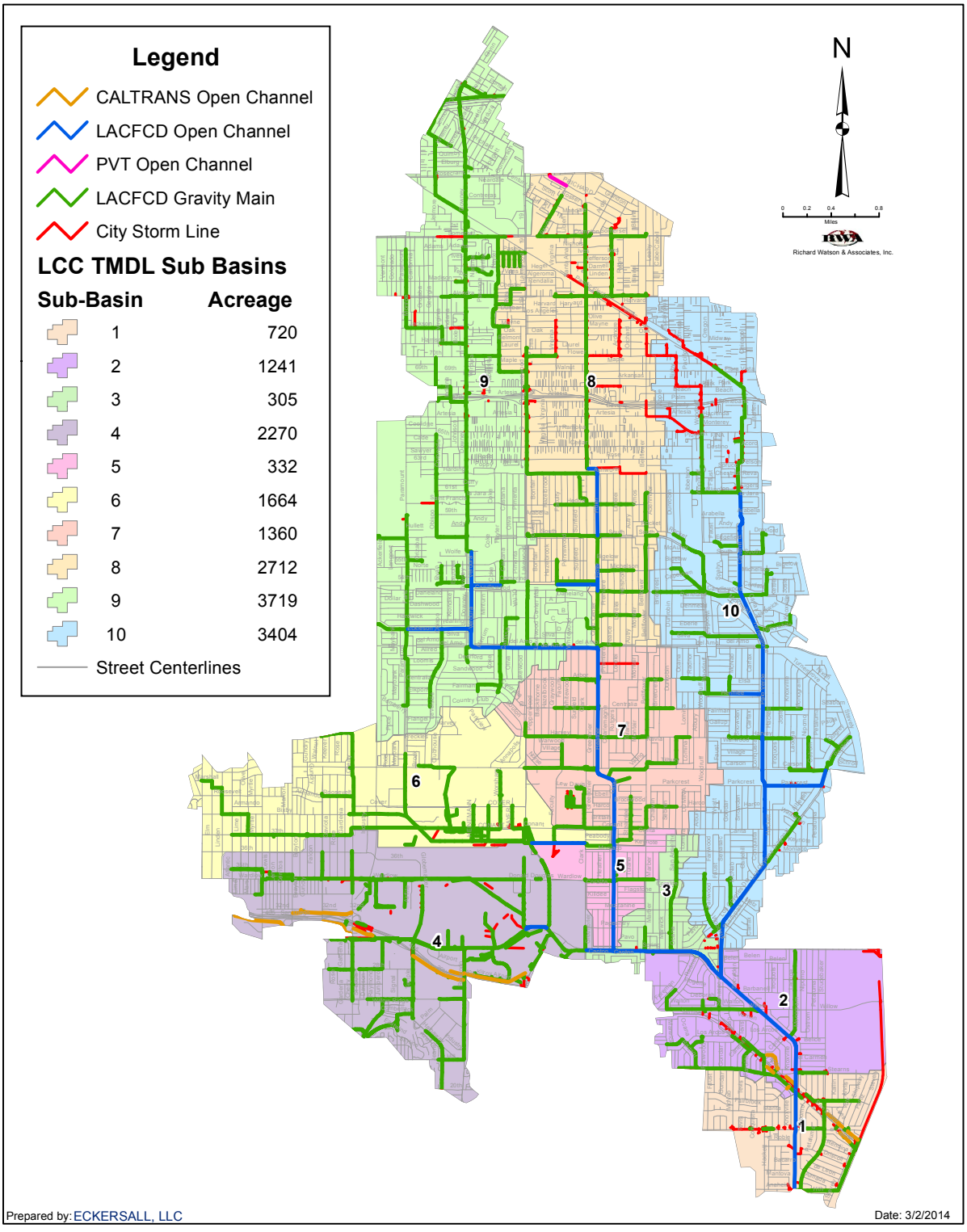
As part of development of the Los Cerritos Channel Total Maximum Daily Loads for Metals, USEPA defined ten sub-basins within the Watershed (See Figure 1-4). Since Order No. R4-2012-0175 specifies that WMPs should reflect sub-watersheds defined in TMDLs, this program emphasizes implementation by sub-basin rather than the sub-watersheds defined in WMMS. The sub-watersheds aggregate to the sub-basins that will facilitate use of Reasonable Assurance Analysis (RAA) sub-watershed information as the WMP is implemented on a sub-basin basis.

Runoff to the Channel is regulated as a point source discharge in the permits; however, there are both point source and nonpoint source contributions to metals loadings in the Channel. Nonpoint sources are those that discharge via sheet flow or natural discharges, or from unregulated sites such as schools. These loadings from a variety of anthropogenic and natural sources accumulate in the Watershed and are washed into the Channel through rainfall. Sources include urban debris, erosion of susceptible materials, agricultural practices, and atmospheric deposition. The percentage of copper contribution from vehicle brake pads in the Los Cerritos Channel is significant. Copper particles are deposited onto land areas by direct deposition and are released into the air during brake pad use and subsequently deposited onto impervious surfaces and transported into water bodies through stormwater and urban runoff.

The Basin Plan for the Los Angeles Region defines one existing beneficial use (wildlife habitat [WILD]) and two intermittent beneficial uses (noncontact water recreation [REC2] and warm water habitat [WARM]) for Los Cerritos Channel. For development of the Los Cerritos Channel Metals TMDLs, USEPA assessed water quality using data from the City of Long Beach stormwater program and five additional samples provided by Kinnetic Laboratories, Inc. Metals data were collected from the Stearns Street monitoring site in the City of Long Beach, above the tidewater in the Los Cerritos Channel. Flow rates based on flow velocity and channel dimensions were used to calculate total flow following storm events. Dry-weather and wet-weather metals concentrations were compared to California Toxics Rule (CTR) values using hardness measured for each sampling event to assess the frequency of exceedances of the CTR criteria for copper, lead, and zinc in Los Cerritos Channel. Monitoring indicates exceedances for copper in dry weather, but not for lead or zinc. In wet weather, monitoring indicates exceedances for copper and zinc. A dry-weather TMDL was developed for copper, and wet-weather TMDLs were developed for copper, lead, and zinc. However, the wet-weather lead TMDL requires no further reductions.

The latest Los Angeles County MS4 Permit (Order No. R4-2012-0175) was adopted by the Los Angeles Regional Water Quality Control Board on November 8, 2012 and became effective December 28, 2012. This Permit covers 86 co-permittees, including 84 incorporated cities, the County of Los Angeles, and the LACFCD, and is on a five-year renewal cycle. The City of Long Beach MS4 Permit (NPDES Permit Order No. R4-2014-0024) was adopted on February 6, 2014, and is also on a five-year renewal cycle. It covers the City of Long Beach portions of the watershed.

Figure 1-4. Los Cerritos Channel Sub-basins



1.5 Organizing to Address Water Quality

As noted above, the Los Cerritos Channel Watershed Group has been working together since late 2008, when the group organized in response to a draft of the EPA-established Metals TMDLs for the freshwater portion of the Los Cerritos Channel Freshwater Watershed. The participating agencies, together with the Gateway Water Management Authority (GWMA), which acts as the fiduciary agent for the Watershed Group, entered into memoranda of agreement in 2010. Because of this history of working together to address water quality issues in the watershed, and because of its organizational arrangements with GWMA, the Watershed Group has chosen to continue its focus on the Los Cerritos Channel portion of the Los Cerritos Channel and Alamitos Bay Watershed Management Area, while taking into account water quality impairments in the Los Cerritos Channel Estuary and the Greater Los Angeles/Long Beach Harbor to which the Los Cerritos Channel Watershed may be contributing.

Since the adoption of the new MS4 Permit, the Watershed Group has comprehensively analyzed the range of stormwater management alternatives in the new Permit for addressing targeted stormwater pollutants in the Los Cerritos Channel. The Watershed Group elected to continue working together in a multi-agency effort to prepare a WMP and CIMP. The draft program plan was submitted to the Regional Water Board on June 29, 2014.

Cities implementing all aspects of the approved program will, with some exceptions, be deemed in compliance – at least for an interim period – with the receiving water numerical discharge limits. Under the Permit there is also protection from third party litigation risks for agencies participating in a WMP.

1.6 Metals TMDLs

The USEPA-established *Los Cerritos Channel Total Maximum Daily Load for Metals* (March 17, 2010) includes the problem statement, numeric targets, source analysis, loading capacity, load allocations (LAs), waste load allocations (WLAs), and margin of safety, but does not include an implementation plan or schedule. As noted earlier, the Regional Water Board has adopted and the State Water Board has approved a Basin Plan Amendment that includes a general implementation plan and a schedule.

The Cities in the Watershed Group have contributed to the effort by the California Stormwater Quality Association (CASQA) and Sustainable Conservation to develop the legislation that ultimately became SB 346. It requires incremental reduction in the amount of copper in vehicle brake pads. Implementation of SB 346 will, over time, significantly reduce the level of copper in urban waters throughout the state. As noted previously, a significant percentage of the copper loading to the Los Cerritos Channel is due to copper in brake pads. Implementation of SB 346 should assist Watershed Group member cities and agencies to reduce copper loadings in their jurisdictions. This represents an example of “true source control,” which is the most cost-effective way to achieve pollutant reductions.

Table 1-3 lists applicable interim and final water quality based effluent limitations established by the Implementation Schedule for the Los Cerritos Channel Metals TMDLs.

Table 1-3: Implementation Schedule for LCC Metals TMDL

TMDL Order	WQBEL	Interim/Final	Compliance Date
Metals TMDLs 2010-2026	Dry Weather[1] 30% of drainage area	Interim	9/30/2017
	70% of drainage area	Interim	9/30/2020
	100% of drainage area	Interim	9/30/2023
	Wet Weather[1] 10% of drainage area	Interim	9/30/2017
	35% of drainage area	Interim	9/30/2020
	65% of drainage area	Interim	9/30/2023
	100% of drainage area	Final	9/30/2026

[1] An Implementation Schedule for the Los Cerritos Channel Metals TMDLs was approved by the Regional Water Board on June 6, 2013 in Attachment B to Resolution No. R13-004.

1.7 MS4 Permit Requirements

Section VI.E.3 of the Los Angeles County MS4 Permit provides a framework for developing implementation plans for USEPA-established TMDLs by requiring Permittees subject to waste load allocations (WLAs) to propose and implement best management practices that will be effective in achieving compliance with USEPA-established numeric WLAs. A CIMP is required to be submitted either separately or as part of a WMP. The Watershed Group's CIMP is required to integrate requirements of the current Los Angeles County MS4 Permit, the City of Long Beach MS4 Permit, and TMDL monitoring requirements.

On June 6, 2013, the Los Angeles Regional Water Board adopted Resolution No. R13-004 that amended the Water Quality Control Plan for the Los Angeles Region to incorporate implementation plans for the TMDLs for Metals in the Los Cerritos Channel and for Metals and Selenium in the San Gabriel River and Impaired Tributaries. Attachment B to the Resolution specifies an interim compliance date of September 30, 2017, which is after the anticipated approval date for the WMP, but is approximately three months prior to the expiration date for the Los Angeles County MS4 Permit. Attachment B also specifies two additional interim compliance dates in 2020 and 2023 and a final compliance date of September 30, 2026. Pursuant to Section VI.E.3 of the Order, the WMP will become the Implementation Plan for the EPA-established Los Cerritos Channel TMDLs for Metals.

The new MS4 Permit requires that participating agencies prepare individual Letters of Intent to participate in development of a WMP. The member agencies of the LCC Watershed Group each prepared and submitted such letters.

1.8 Overview of WMP Strategy

The Los Cerritos Channel Watershed Group member agencies continue to engage in a number of required control measures that were initiated prior to commencement of WMP development and that have continued throughout the WMP development process. In addition, the Watershed Group has concluded that the best way to address water quality impairments within the Los Cerritos Channel

receiving waters is to implement a multi-faceted WMP strategy utilizing each member agency's stormwater management program along with customized strategies, control measures, and BMPs at the watershed and sub-basin levels. The initial focus will be on true source control, runoff reduction, and total suspended solids (TSS) reduction. Once those options have been pursued, Watershed Permittees will pursue LID and green streets, operational source control, capture and infiltration, capture and use, and treatment controls (See Figure 3-1 in Section 3.0). However, planning for additional measures will occur concurrently with implementation of true source control measures.

True source control – reducing or eliminating a pollutant at its source – is a critical component of this strategy. Its effectiveness is simple: if pollutants are not generated or released, they will not be available for transport to the receiving waters. The Watershed Group has focused particularly on true source control because major sources of copper, lead, and zinc are released into the atmosphere, resulting in widespread deposition on impervious surfaces such as streets, highways, parking lots, and rooftops, in addition to the direct deposition that occurs on streets, highways, parking lots, and driveways. Copper is being addressed through the implementation of SB 346.

The Watershed Group is planning to work with CASQA to address a major source of zinc – automotive tires. The Department of Toxic Substances Control (DTSC) adopted new Safer Consumer Product Regulations that establish a process for identifying, prioritizing, and eliminating or reducing Chemicals of Concern in Priority Products. Because the requirements for inclusion on the initial priority product list are restrictive, these regulations cannot be used to reduce zinc in tires until after January 1, 2016. However, the Watershed Group will be able to work with CASQA and others to develop a well-supported petition to support the addition of zinc in tires as a product-chemical combination on the Priority Products List.

The Watershed Group will also emphasize TSS reduction. Reducing total suspended solids in the receiving waters should result in a significant reduction of metals and legacy organics, since both groups of pollutants adhere to sediment. This initial emphasis on TSS reduction should reduce the volume of water that ultimately needs to be captured and infiltrated or used to achieve standards for metals and legacy organics. The Watershed Group also will implement an enhanced street sweeping and parking lot sweeping program within the upper Palo Verde Channel sub-basin and/or the upper Clark Channel sub-basin during the first phase of implementation of this plan.

The runoff reduction strategy will initially focus on reduction of dry-weather runoff to substantially improve water quality during dry-weather days. This will involve a combination of water conservation and improvements in landscape irrigation efficiency to eliminate or greatly reduce overspray and runoff that provides a transport mechanism to carry pollutants to the storm drain system and into the receiving waters of the Los Cerritos Channel. Watershed Group members will use their Public Outreach Programs and Public Agency Activities Programs to promote and monitor operational source control measures that address priority pollutants within the Watershed. Runoff reduction will also involve dry-weather diversions to either the sanitary sewer system or infiltration/evapotranspiration facilities, such as infiltration trenches and rain gardens.

Reducing runoff during wet weather is challenging and costly. The Watershed is essentially built-out and will be partially dependent on redevelopment to create opportunities for wet-weather runoff reduction. However, member agencies will implement green streets; retrofit low impact development (LID) components at key locations; and reduce directly connected impervious areas. In addition, member agencies will implement capture and use and capture and infiltrate measures to the maximum extent practicable.

Because of the depth to the drinking water aquifer and the widespread presence of clay lenses throughout the Watershed, implementation of a capture and infiltrate strategy will be challenging. The Watershed Group has attempted to locate initial potential water capture facilities in locations where captured stormwater can be treated, if necessary, and used for irrigation if infiltration is not feasible. These locations include local parks and golf courses and, potentially, school sites. To date, thirteen first order water capture sites have been identified. The three initial projects are planned for two park locations and a golf course, locations that will be particularly helpful in bringing the upper portions of sub-basins 4, 8, and 10 into compliance with the Waste Load Allocations in the Metals TMDLs and reduce the loads of other priority pollutants with similar fate and transport mechanisms.

The Watershed Group will also implement operational source control measures. These measures include street sweeping and cover and containment, as well as education and outreach efforts to encourage public and private sector entities to reduce or eliminate the discharge of pollutants or to reduce or prevent the contact of pollutants with rainwater and/or urban runoff.

Except for vegetative treatment associated with LID and green streets, MS4 treatment control is generally viewed by the Watershed Group as a last resort to be used when true source control, runoff reduction, TSS reduction, and operational source control are not sufficient. The Permittees anticipate that much of the treatment control implemented in the Watershed will be associated with implementation of LID ordinances and green streets policies. Further, although enhanced street sweeping should be sufficient to control direct and indirect deposition of zinc on arterials and residential streets, control of zinc from industrial sources may require the installation of targeted treatment controls. The need for installation of treatment control facilities will be continually re-evaluated through the adaptive management process required by Order No. R4-2012-0175 and explained in Section 10 of this Program.

The adaptive management process will be key to successful implementation of the Los Cerritos Channel Watershed Management Program. The Watershed Group will utilize management techniques set forth in this Program, assess and monitor for results, and refine program components, as necessary. For further details on the Watershed Group's multi-pronged strategy, including its Financial Strategy, please see Section 3.0 of this Program.

2.0 Identification of Water Quality Priorities

2.1 Water Quality Characterization

2.1.1 Introduction

The Permittees within the Los Cerritos Channel Watershed are fortunate to have 13 years of data collected by the City of Long Beach at its Stearns Street mass emission monitoring site. This monitoring site was established pursuant to the City's individual MS4 permit first adopted in 1999

Major elements incorporated in Long Beach's monitoring and reporting program include 1) mass emission monitoring during storm events, 2) monitoring of dry weather discharges at each mass emission site, and 3) special studies. Special studies were included in the original permit to provide the flexibility necessary to allow the program to respond to new issues or concerns that might arise in the course of routine monitoring or as the result of emerging topics in stormwater science. Special studies were generally intended to improve assessment of impacts on receiving water, identify sources and sinks for contaminants, and assess compliance with TMDL targets and water quality objectives. The City has developed a variety of special studies during the past 13 years. In addition, the City has incorporated analysis of additional pollutants of concern based upon changes that have occurred with respect to pesticides that are available for residential use. Data from the monitoring program is intended to support decisions necessary to refine BMPs for the reduction of pollutant loading and the protection and enhancement of beneficial use of the receiving waters.

Mass emission monitoring is specified to be conducted at four sites during four wet weather storm events each year, including the Stearns Street site for the Los Cerritos Channel. The 1999 permit allowed for a phased implementation process with monitoring of the Los Cerritos Channel site starting in the second year of the program. An automated monitoring station was first installed and operable for the 2000/2001 wet season. Dry season monitoring was started in June 2001.

Storm Water Runoff at the Los Cerritos Channel Monitoring Station

The Stearns Street monitoring station serves as both a mass emission monitoring site for the City of Long Beach stormwater monitoring program and as the compliance point for the Los Cerritos Metals

TMDL. The storm water monitoring station is installed in a steel utility box located on the west side of the channel south of Stearns Street. Water level/flow sensors and Teflon/FEP tubing for water sampling are installed on the bottom of the large concrete lined channel. The sensors and intake tubing pass through conduit to protect against the high flows and debris passing through the channel. Flow rates based upon measured water levels and a stage-flow rating curve used at an adjacent gauging station that is no longer in service.

This sampling site is normally above tidewater on Los Cerritos Channel. During extreme tides that typically occur during the dry weather surveys, this site can be impacted by backwater conditions. This has been remedied in recent years by scheduling dry weather sampling for periods that have less extreme tidal ranges.

The Long Beach mass emission monitoring program was developed to characterize stormwater discharges, identify contaminants of concern and develop pollutant load estimates for each major watershed. Monitoring is required to be conducted during the first significant rainfall event of the season. Flow-rated, whole storm composite samples are obtained and analyzed for major constituents of concern which include conventional constituents, total and dissolved metals. For the past two years, this has also included pyrethroid pesticides, and, for the past year, Fipronil.. A more comprehensive set of constituents was analyzed during the earlier years of the program. These included extensive screening for semivolatile organics (acid, base and neutral compounds), MBTE, and larger suites of both triazine pesticides and trace metals. The analytical set was selectively reduced after these compounds failed to occur at levels exceeding Minimum Levels (MLs) or where concentrations did not exceed any available and appropriate water quality standards. Toxicity testing using sea urchin fertilization tests and water flea survival and reproduction is conducted on composite storm samples. Toxicity tests during the earlier years of the program also included mysids but tests conducted at that time were not as sensitive as either the sea urchin fertilization test or the water flea tests. As with the chemical constituents, toxicity testing using mysids was suspended in lieu of the more sensitive tests. Phase 1 Toxicity Identification Evaluations (TIEs) are required to be performed on all samples that exhibit toxicity in excess of predetermined trigger values. The TIE process is used to determine the likely contaminants contributing to the observed toxicity.

Dry weather monitoring at Stearns Street consists of inspections conducted at the mass emission site and the collection and analysis of dry weather discharges over 24-hour periods. Monitoring is required to be conducted twice during each dry season. Sampling is typically conducted in September just prior to the storm season and in May following several weeks of dry weather. This element of the program is intended to assist in identification of pollutants of concern, assess the impacts that these pollutants might have on biological communities in the receiving waters and identify the sources of these contaminants such that they can be effectively controlled or eliminated. Dry weather discharge samples

are subjected to the same chemical analysis and toxicity testing procedures as used for storm water monitoring.

2.1.2 Summary of Water Quality Conditions in the Los Cerritos Channel Freshwater Receiving Waters

The following sections discuss the quality of stormwater and dry weather discharges from the mass emission monitoring site. Concentrations of contaminants measured in both wet and dry weather discharges were compared with various receiving water quality criteria. Temporal trends over the past 13 years were examined for principal contaminants of concern. Data from the Stearns Street site were examined in great detail in order to assess progress towards meeting established Waste Load Allocations in the Los Cerritos Channel Metals TMDLs. The toxicity of both storm water and dry weather discharges are summarized for the duration of this time period. Water quality data associated with stormwater runoff (Table 2-1) and dry weather discharges (Table 2-2) are summarized for the most common contaminants of concern. Benchmarks used to evaluate receiving waters are summarized in Table 2-3 and Table 2-4.

For the purpose of this analysis, water quality criteria or objectives were used to provide reference points for assessing the relative importance of various stormwater contaminants, though specific receiving water studies are necessary to quantify the presence and magnitude of any actual water quality impacts. Ultimately, specific beneficial uses of the receiving water body should be considered when selecting the appropriate benchmarks.

Water quality criteria used as benchmarks in freshwater environments are summarized in Table 2-3 Criteria applicable to saline conditions are summarized separately in Table 2-4. These reference water quality criteria are useful for screening Event Mean Concentrations (EMCs) generated for most of the major constituents measured as part of this program. Most importantly, these benchmarks are only intended to serve as a tool to assist with the interpretation of the storm water quality data. Exceedances of these receiving water quality benchmarks do not necessarily indicate impairment. Other factors such as dilution, duration and transformation in the receiving waters must also be considered. Nevertheless they can be extremely useful in screening for analytes that might have greater potential to impact receiving waters and/or warrant more consideration in development of BMPs and implementation of source control strategies.

For comparative purposes, an EMC was considered to be an exceedance if the value was higher than any of the reference or benchmark values. In using these benchmarks, it is important that the source of the specific criterion is considered. For instance, metals concentrations derived from California Toxics Rule (CTR) freshwater criteria for protection of aquatic life are based upon dissolved concentrations and are often a function of hardness. Values listed in Table 2-3 are based upon a default hardness of 100 mg/L

which is consistent with tabulated values provided in the CTR. Evaluation of any possible exceedance of hardness-dependent criterion is based upon the actual hardness EMC for the site and event therefore the criterion will change. Hardness measured during wet weather events is typically far less than 100 mg/L while hardness associated with dry weather events will be substantially higher. For metals with criteria dependent upon hardness, CTR criteria tend to be much higher for dry weather discharges since elevated hardness encountered during the dry season tends to mitigate potential toxicity of these metals. Saltwater objectives listed for metals under the CTR are also based upon dissolved concentrations while those listed under the California Ocean Plan are based upon total recoverable measurements. Although Ocean Plan numbers are used for comparative purposes, the marine and estuarine receiving waters in the Los Cerritos Channel Estuary would only be subject to the CTR saltwater values since both Alamitos Bay and San Pedro Bay are considered enclosed bays and estuaries. Water quality criteria provided in the Los Angeles Basin Plan are primarily based upon Title 22 drinking water standards. For two of the key organophosphate pesticides, the only available water quality criteria are those proposed by the California Department of Fish and Game (Siepmann and Finlayson, 2002). UC Davis (Faria et al. 2010; Fojut et al. 2012) has recently provided a series of reports that suggest new acute and chronic water quality criteria for a series of pesticides that include various pyrethroids and organophosphate pesticides.

Both acute and chronic water quality criteria are used in this evaluation. Due to the limited period of discharge, the acute criteria are considered most applicable to storm water. Dry weather discharges are most appropriately compared against chronic criteria (CCCs or daily maxima).

2.1.2.1 Wet Season Water Quality

The water quality criteria for pH included in the Los Angeles Basin Plan (CRWQCB, Los Angeles, 1994) indicate that surface waters should be maintained in the range of 6.5 to 8.5. Elevated pH is extremely atypical due to the acidic nature of rainfall. It is unusual to have storm water with measured pH values greater than the upper Basin Plan limit of 8.5 but historically a small percentage of storm water samples have exceeded the upper standard of 8.5.

Although care is taken to get accurate pH measurements, it is well known that accurate measurements in water with low ionic strength are difficult to obtain due to instability and slow response times. It is possible that some historical measurements were impacted by this problem. Sensors and measurement techniques for addressing water with low ionic strength have improved over the past decade.

The total coliform, fecal coliform and enterococcus single sample benchmarks are commonly exceeded during wet weather sampling events. Grab samples taken for bacteria during storm events most often exceed Basin Plan water quality criteria but also have shown a tremendous degree of variability. This can be attributed to both extreme variability that can occur over the course of a storm event and even

extreme short-term variability that is common when taking field duplicates. Although the variation is substantial, overall concentrations of fecal indicator bacteria (FIBs) in storm water average about 104 mpn/100 ml for both Enterococcus and fecal coliform. *E. coli* have not been directly measured as part of the storm water monitoring program, however, fecal coliform concentrations provide an upper estimate of the *E. coli* in the water samples. The monitoring program will be transitioning to *E.coli.*

Over the past 13 years, four total recoverable metals including aluminum, copper, lead and zinc have frequently exceeded benchmark reference values. Criteria for total recoverable aluminum exist for drinking water (Basin Plan criteria) and aquatic life as a nonpriority pollutant (Table 2-3). Elevated levels of aluminum are normal during storm events due to naturally high levels in soils and the increased loads of sediment.

Concentrations of total recoverable copper, lead, and zinc measured in runoff at the Stearns Street site have frequently exceeded Ocean Plan criteria over the past thirteen years of the stormwater monitoring program.

Chlorinated pesticides continue to be uncommon in storm water runoff from the Stearns Street mass emission site. When detected, concentrations of detected compounds have typically been low (less than 10 times the reporting limit). Although largely banned or restricted throughout industrialized nations, these legacy pesticides persist in the environment.

The banning of residential, nonprofessional use of diazinon and chlorpyrifos resulted in these contaminants no longer being measureable in most storm water samples. Lower detection limits were implemented in the middle of the 2010/2011 monitoring season. The detection limits for chlorpyrifos dropped from 0.05 µg/L to 0.002 µg/L and the detection limits for diazinon dropped from 0.01 µg/L to 0.0015 µg/L. Use of the lower detection limits resulted in chlorpyrifos being detected in runoff from the Los Cerritos Channel. However, concentrations remain below the benchmark concentrations developed by California Department of Fish and Wildlife.

Pyrethroid pesticides have largely replaced diazinon and chlorpyrifos for pest control in the urban environment. Pyrethroids were not added to the analytical suite until mid-season during 2010/2011. Pyrethroid pesticides have been analyzed in wet weather runoff from the Stearns Street site for the past three years. The presence of bifenthrin, cyfluthrin, cypermethrin and permethrin are of primary concern. Although permethrin is consistently measured at the highest concentrations, this compound is the least toxic of these four pyrethroid pesticides.

These pesticides are known to be highly toxic with several compounds causing a toxic response to *Hyalella* at levels as low as 0.002 µg/L (2 ng/L), which is near the detection limit for many of these compounds. Many of the pyrethroids were measured at concentrations that would be expected to

cause toxicity to *Hyalella* or *Americamysis* but generally low enough that *Ceriodaphnia* would not be expected to show impacts. It is also unlikely that pyrethroid toxicity would be measureable using the standard suite of WET tests being proposed for use in the new Los Angeles County and City of Long Beach MS4 NPDES permits.

Although pyrethroid pesticides are a recognized concern, the short and long-term impacts of these compounds are not well understood. These compounds are extremely difficult to measure since they are highly hydrophobic and tend to adhere to surfaces. In stormwater, pyrethroids tend to partition to suspended solids reducing bioavailability (Yang et al. 2006).

Since these compounds are highly hydrophobic, they are best known for the toxicity that they exert on the benthos. The environmental toxicity of these compounds was first established using amphipod tests that are conducted using sediment. Tests were later modified to use amphipods for water testing. Although these compounds typically have a half-life in water that ranges from days to months, it is expected that they may persist much longer in the sediments. Recently, Lao et al. (2010) identified the presence of pyrethroid pesticides in sediment sampled in the Ballona Creek Estuary. Levels measured in the sediments were considered sufficient to have caused observed toxicity to *Eohaustorius, which* is an amphipod common in marine and estuarine environments.

2.1.2.2 Dry Season Water Quality

With the exception of organophosphate pesticides, water quality of dry weather discharges has not changed substantially since the start of the program in 2000. Dry season water quality has not tended to vary greatly between sites or sampling dates. The most significant changes continue to be decreases in the volume of dry weather discharges.

Exceedance of pH criteria remains one of the most common occurrences during dry weather. These exceedances typically occur only in drainages with open concrete channels. These excursions are not observed in waters that enter the storm drains or receiving waters directly from pipes. Extensive testing conducted in the Los Cerritos Channel during the 2010/2011 season demonstrated natural cycling of pH in any shallow, low flow channel with the presence of algae. Controlling these fluctuations would require enclosing the channel or eliminating flow during the dry seasons. Enclosure of the channels would impact bacterial concentrations by eliminating the sanitizing effects of sunlight that helps to control bacteria.

Exceedances of dissolved metals criteria during dry weather are largely limited to copper in waters from the Los Cerritos Channel. In addition, exceedances of dissolved copper criteria are mostly due to the CTR saltwater criteria. During the dry season, hardness values average 184 mg/L. As a result, water quality criteria for hardness dependent metals are elevated which results in few exceedances of the dissolved copper criterion. At this level of hardness, the CTR freshwater dissolved copper criterion is equal to 15.1 µg/L.

Low levels of four pyrethroid compounds caused exceedances of draft criteria during dry weather however most were detected at concentrations between the Method Detection Limit and the Reporting Limit. Since the criteria proposed by Fojut et al. (2012) are below the reporting limits, these detections were considered to be exceedances. Bifenthrin was the only pyrethroid pesticide detected above reporting limits during the dry weather surveys. With the exception of these pyrethroid pesticides, organic constituents (aroclors, chlorinated pesticides, and organophosphate pesticides) are typically undetected in dry weather samples.

2.1.3 Toxicity Results

The following sections summarize the results of bioassay tests conducted during both dry and wet weather periods at the Stearns Street monitoring site between the year 2000 and 2013. Figure 2-5 and Figure 2-7 summarize chronic toxicity of stormwater to sea urchin fertilization and water flea reproduction, respectively, throughout the thirteen years of the City's monitoring program. Figure 2-4 and Figure 2-6 provides similar summaries of dry weather chronic toxicity for urchins and water fleas, respectively.

Sea urchins have shown more instances of moderate to high (>8 TUc) wet weather toxicity than have water fleas (Figure 2-5 and Figure 2-7).

Figure 2-7 shows a virtual absence of wet weather water flea toxicity after the 2001/2002 storm season at Stearns Street, except minor to moderate reproductive effects in 2004/2005. In the 2008/2009 program, instances of elevated reproductive toxicity were attributed to statistical artifacts due to very low within-test variability. Data from the 2009/2010 and continuing into the 2012/2013 monitoring programs continues to show that water flea toxicity is almost undetectable in wet weather samples.

There was some suggestion in the toxicity data from early monitoring periods that seasonal flushing may have been a factor affecting the variability in storm water toxicity. Early years of the program suggested that *Ceriodaphnia* toxicity was usually somewhat elevated in early versus late storms, but this pattern was not evident in later years. Toxicity to sea urchins has varied widely over the storm seasons allow generally lower toxicity was encountered since 2006 yet occasional toxicity has been encountered at levels as high as 16 TUc or more (Figure 2-5). Since the 2004/2005 storm season water flea toxicity has dropped to near undetectable levels while the sea urchin toxicity has been more sporadic with toxicity increasing slightly in the 2011/2012 and 2012/2013 storm seasons.

Sources of toxicity were examined by comparing measured toxicity with toxicity predicted based upon the chemical analysis of key toxicants. The predicted acute toxicity of the sample is calculated from the measured concentrations of the chemical constituents and their corresponding EC50 or LC50. Expected water flea toxicity was calculated based upon LC50s for zinc, chlorpyrifos and diazinon. Earlier testing implicated these analytes as the primary toxicants contributing to mortality and reproduction. Expected

toxicity for the sea urchin fertilization test was calculated based upon EC50 data for zinc and copper. With few exceptions, concentrations of these two metals were found to be sufficient to explain the most of the toxicity observed in the sea urchin fertilization tests.

2.1.3.1 Test of Significant Toxicity (TST)

The Test of Significant Toxicity (TST) is a statistical approach to analyze whole effluent tests (WET) and ambient toxicity data that is being developed by the U.S. Environmental Protection Agency. The State Water Resources Board has proposed a draft policy to implement statewide use of the TST approach. The new policy is intended to provide a consistent approach to monitoring toxicity in discharges to inland surface waters, enclosed bays, and estuaries. The potential impacts of incorporating the TST approach into storm water programs have not been fully evaluated.

The TST is designed to be used as a two-concentration data analysis of the sample contrasting receiving water, also referred to as the critical concentration, with a control concentration. Once WET tests are completed, results are analyzed with the TST calculator to assess if the sample was toxic. The TST approach is intended to determine if a sample at the critical concentration and the control within a WET test differ by an acceptable amount. This method yields a simple yes/no as to whether or not a sample is considered toxic.

Table 2-5 provides a comparison of use of the NOEC and TST methods for initiation of Toxicity Identification Evaluations (TIE) using the results of water flea reproduction tests conducted in waters from the Los Cerritos Channel over the past three years. Application of the TST indicated presence of significant toxicity in four of 15 bioassay tests. Only one of these also exceeded an effect level of 50%, which would require immediate implementation of TIE testing under the new Los Angeles County MS4 permit. This was a dry weather sample taken in May 2013.

For the 2012/2013 Los Cerritos Channel season data from all water flea reproduction tests (storm water and dry weather tests) were subjected to both analytical approaches. All storm water samples for water flea reproduction passed using both the NOEC and TST approach. However, use of the TST approach would have triggered an additional TIE test for the Los Cerritos Channel site for a dry weather test in May 2013. This sample had minor evidence of toxicity with a TUc of 2.0. Under the program guidelines, this was minor toxicity was not sufficient to warrant TIE testing.

2.1.4 TMDLS

The Los Cerritos Channel Metals TMDLs established WLAs for total copper, lead and zinc during wet weather and total copper during dry weather. Total lead limits were based upon maintenance of historical concentrations. Total lead concentrations and loads remain compliant with the TMDL limits. Total copper exceeds existing targets by factors ranging from 1.9 to 8. Total zinc exceeds target levels by

factors of 1.4 to 5.9. Both total lead and total zinc concentrations show evidence of steady decreases in concentration over the past 13 years. During dry weather periods, both concentrations and loads of total copper are declining. The combination of these factors has resulted in dry weather copper loads within the Los Cerritos Channel declining to levels that are less than 20% of the WLA. The copper dry-weather loading capacity (TMDL) for Los Cerritos Channel was established based upon the following calculation: 19.1 µg/L X 2.35 cfs X 0.00539 (conversion factor) = 0.242 lbs/day or 109.7 grams/day. The TMDL objectives are expressed as total recoverable metals.

Dry weather flows have dramatically declined in recent years (Figure 2-3) presumably due to better water conservation efforts. The average flow measured at the Los Cerritos Channel monitoring site has been consistently under 0.5 cfs since 2009. At the same time, concentrations of total copper have significantly declined. The combination of these factors resulted in dry weather copper loads in the Los Cerritos Channel declining to levels that are less than 20% of the WLA.

The wet weather load capacities for total copper, total lead, and total zinc were calculated based upon storm volumes and the following concentrations:

Total copper = 9.8 ug/L
Total lead = 55.8 ug/L
Total zinc = 95.6 ug/L

Table 2-6 provides a summary of the TMDL load limitations for copper, lead and zinc along with storm volumes, calculated loads, and exceedance factors for storm events from 2011 through 2013. As noted above, measured loads of total copper exceed the TMDL limits by a factor of 1.9 to 8.0. Similarly, measured loads of zinc exceed the TMDL limitation by factors ranging from 1.4 to 5.9. Load limits established for total lead were based upon assuring that historical conditions were not exceeded. Lead loads have not exceeded a factor of 0.8 (or 80%) of the limit established in the TMDL. This suggests that the historical decline in lead concentrations is continuing. A comparison of concentrations of total copper, lead and zinc prior to the TMDLs and after the TMDLs (Figure 2-1) shows little evidence of changes for metals over this short time but the concentrations of total lead do show less variability in recent time. In contrast, the concentrations for total copper and zinc show substantial variability in post TMDL measurements.

Figure 2-2 provides a more detailed examination of trends over time. Graphics on the left side of the page separate conditions before and after implementation of the TMDLs while those on the right side of the page simply illustrate long-term trends. Flows associated with monitored events are relatively consistent although there is some suggestion that flows associated with these events have slightly increased over time.

Concentrations of total copper have been relatively stable but both total lead and total zinc concentrations show evidence of decreases in concentration over the past 13 years. Wet weather loads show similar but more muted trends as a result of increase in storm volumes. Apparent decreases in

total zinc loads after implementation of the TMDL are of interest but are likely an artifact of the limited post-TMDL data set.

Necessary decreases in concentrations of total copper are best illustrated by examination of the distributional characteristics of total copper concentrations. All measurements of total copper have exceeded the limit established in the TMDL. In order to meet TMDL requirements, total copper concentrations will need to be reduced by more than 70%.

2.1.5 Summary of Monitoring Results

Monitoring of storm water runoff and dry weather flows at the Los Cerritos Channel Stearns Street mass emission site over the past 13 years has resulted in the identification of a relatively small list of constituents of concern. Elevated concentrations of total recoverable aluminum, copper, lead and zinc are commonly associated with storm water discharges due to increased sediment loads. Concentrations of these metals are typically associated with elevated sediment concentrations during storm events. Aluminum is expected to be elevated during storm events simply due to the natural abundance of this metal in soils. Although aluminum temporarily exceeds drinking water quality criteria during storm events, it is not considered to be a major constituent of concern. Concentrations of total recoverable lead are also elevated during storm events but concentrations of dissolved lead consistently meet existing water quality objectives. As a result, the Los Cerritos Channel Metals TMDL established a WLA for total recoverable lead based upon existing loads for both anti-degradation purposes and to assure that downstream waters are protected. Concentrations of dissolved copper and zinc commonly exceed freshwater water quality criteria [California Toxics Rule (CTR) Criteria Maximum Concentrations (CMS)] during storm events and are the two metals of primary concern. Long-term trends suggest that both lead and zinc have been declining slightly during the past decade but concentrations of copper remain relatively steady. Concentrations of copper are expected to decline with reductions in the copper content of brake pads. Recent information from the Washington State Department of Ecology and NSF International indicate that significant reduction of copper in brake pads have already begun (See California Stormwater Quality Association Technical Memo in Attachment D).

Two organophosphate pesticides, diazinon and chlorpyrifos, were commonly detected in storm water runoff before 2002-2003 when they were banned for residential use. By 2006, concentrations of both compounds declined to levels below benchmarks established by California Fish and Wildlife. These compounds are no longer considered to be constituents of concern.

Fecal Indicator Bacteria (FIBs) tend to be elevated in receiving waters during both wet and dry weather, but concentrations increase substantially during storm events. Concentrations of fecal coliform range from 10^4 to 10^5 MPN/100 ml during storm events.

Exceedance of pH criteria is common during periods of dry weather. A year-long study identified a consistent daily cycle of increasing pH during the day and decreasing concentrations at night that was attributed to low flows and intensive algal production. When storm events occur, pH concentrations become relative stable and remain within water quality objectives.

Organochlorine pesticides are not common in stormwater discharges from the Los Cerritos Channel but, when detected, concentrations are typically near detection limits. In most cases, measured values range from near at concentrations within 10 times the reporting limits.

In recent years, monitoring was extended to incorporate pyrethroid pesticides. Four of these compounds, bifenthrin, cyfluthrin, cypermethrin and permethrin are of primary concern. Initial studies indicate that concentrations measured during storm events are sufficient to produce a toxic response to more sensitive bioassay species. These compounds are also present in dry weather flows but concentrations are diminished.

A general trend of reduced toxicity has been observed for both stormwater and dry weather flows from the Los Cerritos Channel Freshwater watershed. Thirteen years of bioassay testing during both wet and dry weather indicates that toxicity is decreasing in both frequency and intensity. Decreases in toxicity are most evident during periods of dry weather with tests conducted with water fleas showing the most improvement. Decreases in toxicity were attributed to the elimination of residential uses of diazinon and chlorpyrifos. Bioassays using the sea urchin fertilization test have shown similar improvements. A number of TIEs have been conducted during this time period and in all cases results of the TIEs have shown that toxicity was caused by cationic metals. Cationic metals are simply metals in an ionic form with positive charges. These may include forms of the more common metals present in runoff (cadmium, copper, nickel, lead and zinc).

Comparisons of the actual toxicity versus expected toxicity calculated from the concentrations of key toxicants confirmed that metals were the most likely cause of toxicity in the sea urchin fertilization test. Concentrations of dissolved metals, particularly zinc and copper, measured in stormwater samples were typically sufficient to explain observed toxicity.

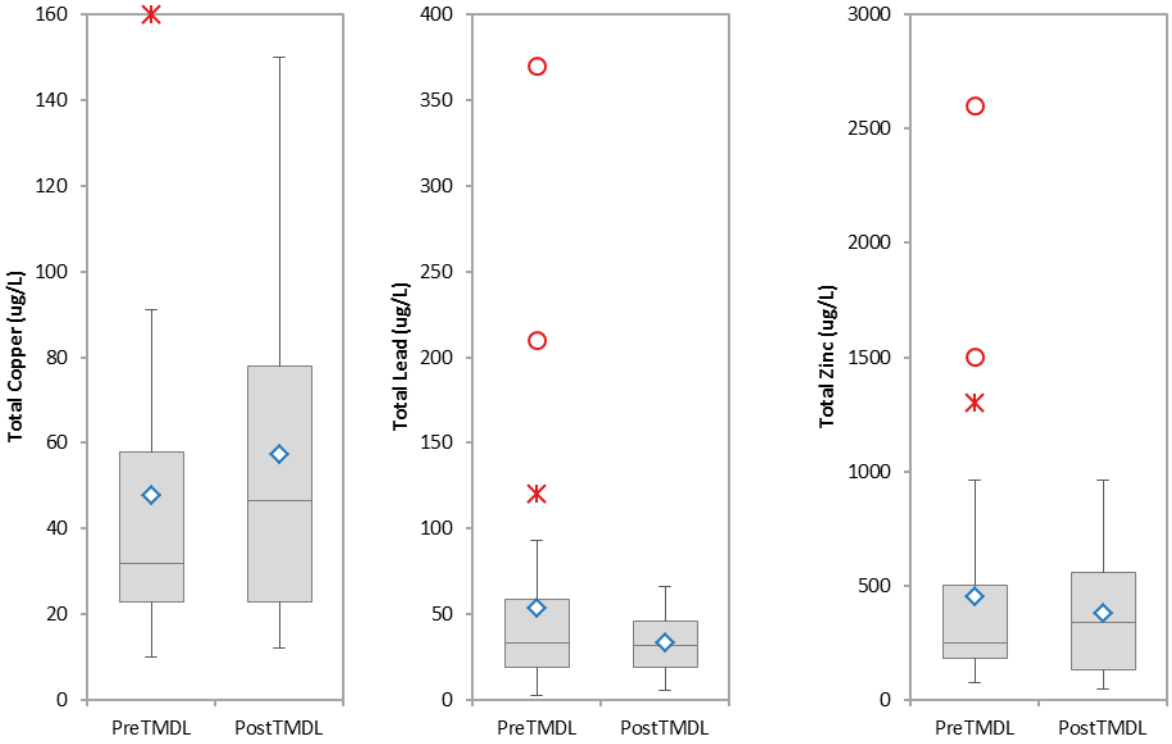


Figure 2-1. Box Plots showing the Distribution of Total Copper, Lead and Zinc before and after TMDL Implementation at the Los Cerritos Channel Monitoring Site (PreTMDL=35 samples, PostTMDL=10 samples)

Box plots display the minimum, 1st quartile, median, mean and 3rd quartile are displayed together with both limits (the ends of the "whiskers") beyond which values are considered anomalous. The mean is displayed with blue ◊ and a black line corresponds to the median. Limits are calculated as follows:

Lower limit: Linf = X(i) such that {X(i) – [Q1 – 1.5 (Q3 – Q1)]} is minimum and X(i) = Q1 – 1.5 (Q3 – Q1).

Upper limit: Lsup = X(i) such that {X(i) - [Q3 + 1.5 (Q3 – Q1)]} is minimum and X(i) = Q3 + 1.5 (Q3 – Q1)

Values that are outside the [Q1 - 3 (Q3 – Q1); Q3 + 3 (Q3 – Q1)] interval are displayed with the * symbol. Values that are in the [Q1 - 3 (Q3 – Q1); Q1 – 1.5 (Q3 – Q1)] or the [Q3 + 1.5 (Q3 – Q1); Q3 + 3 (Q3 – Q1)] intervals are displayed with the "**o**" symbol.

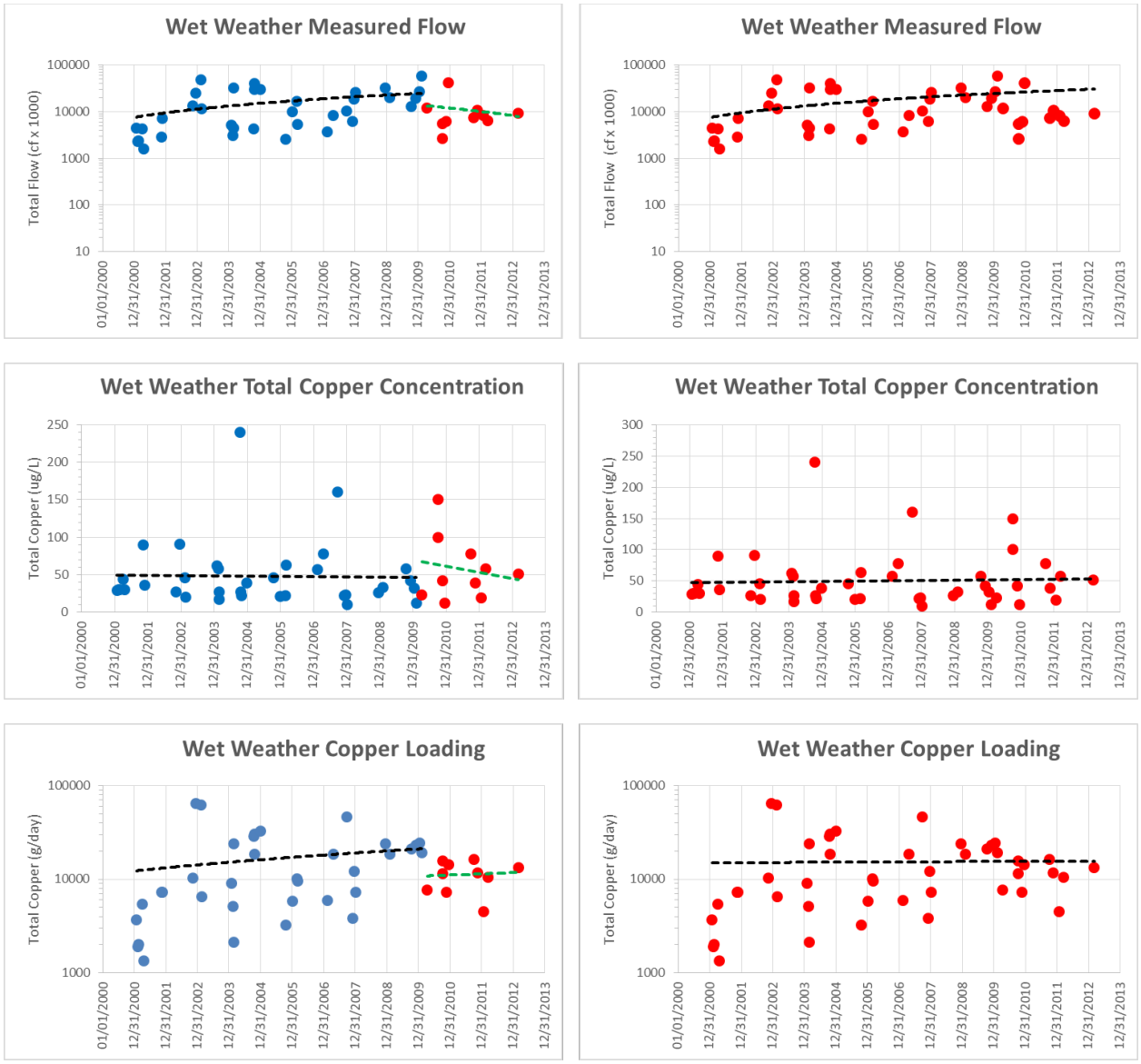


Figure 2-2. Stormwater Flow, Concentration and Loads for Total Copper, Zinc and Lead at the Los Cerritos Channel Station.

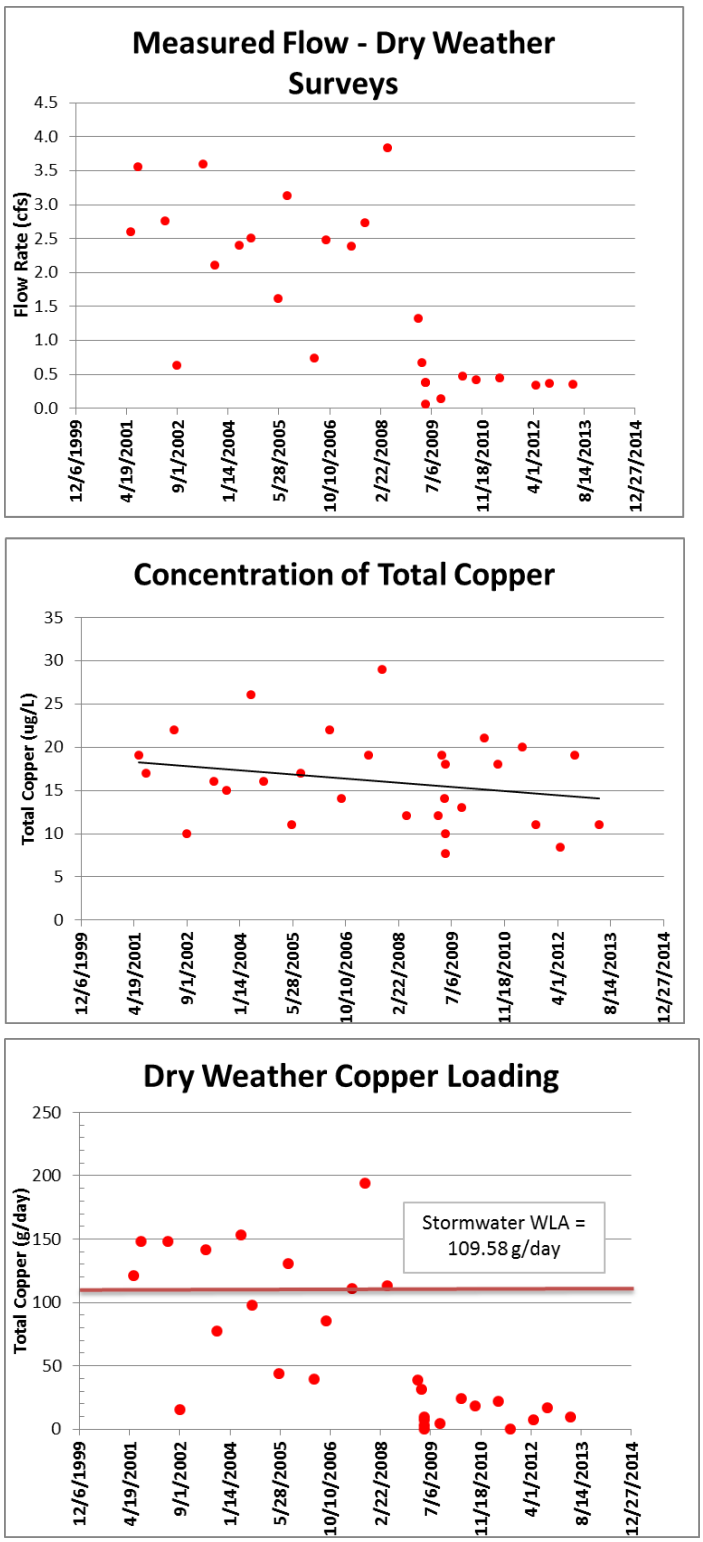


Figure 2-3. Dry Weather Flow, Total Copper Concentrations and Total Copper Loading at the Los Cerritos Channel Monitoring Site

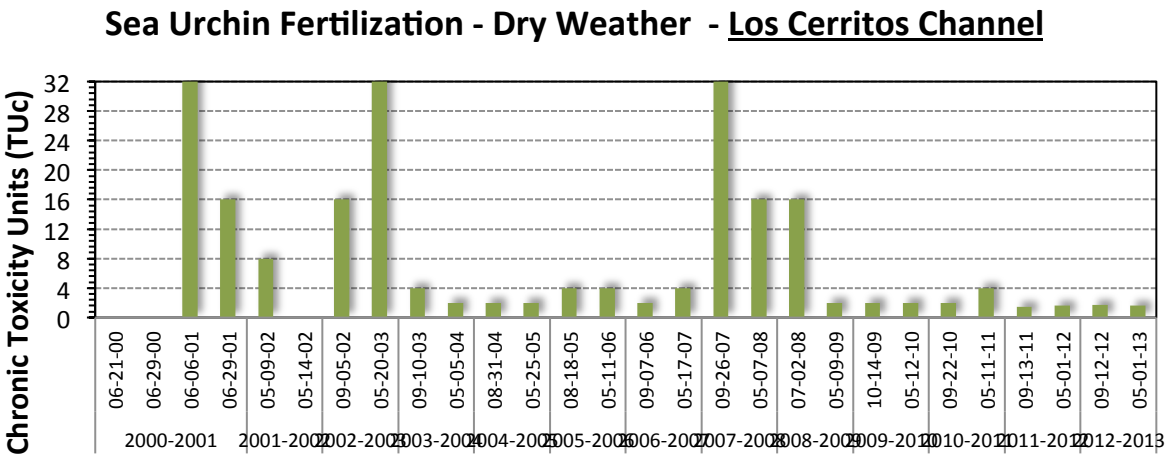


Figure 2-4. Chronic Toxicity of Dry Weather Discharge to Sea Urchin Fertilization 2000 to 2013.

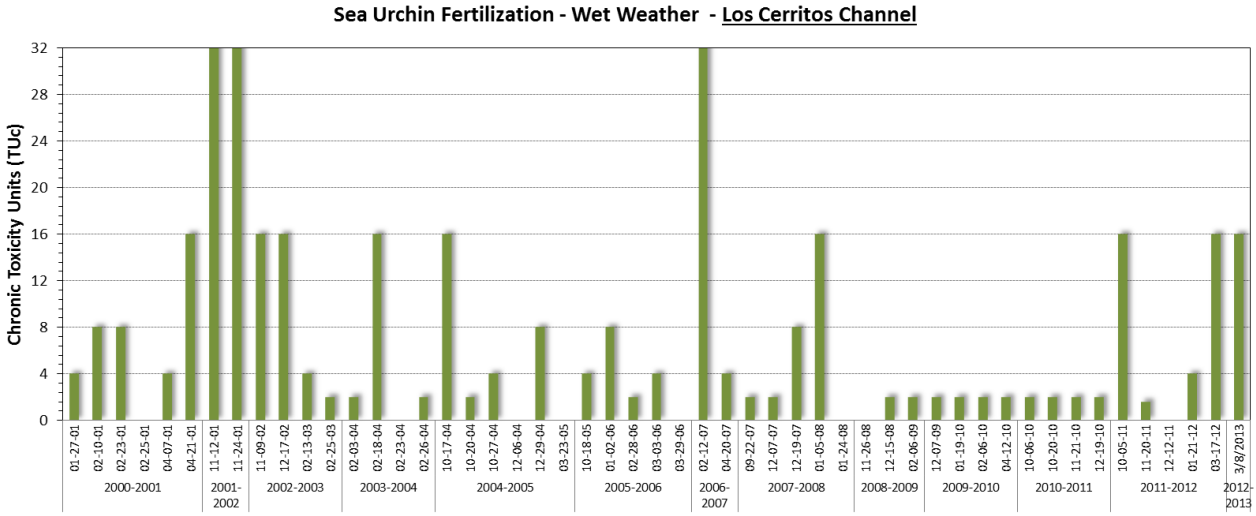


Figure 2-5. Chronic Toxicity of Stormwater Discharge to Sea Urchin Fertilization 2000 to 2013.

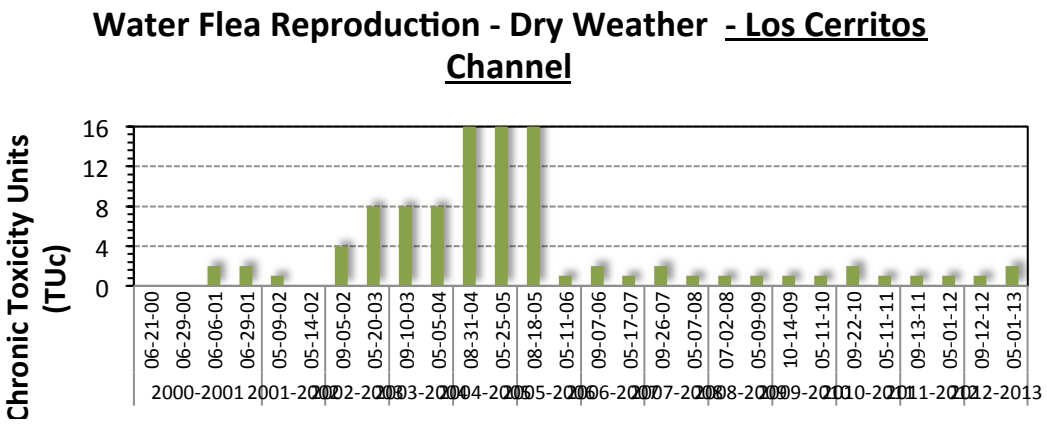


Figure 2-6. Chronic Toxicity of Dry Weather Discharge to Water Flea Reproduction 2000 to 2013.

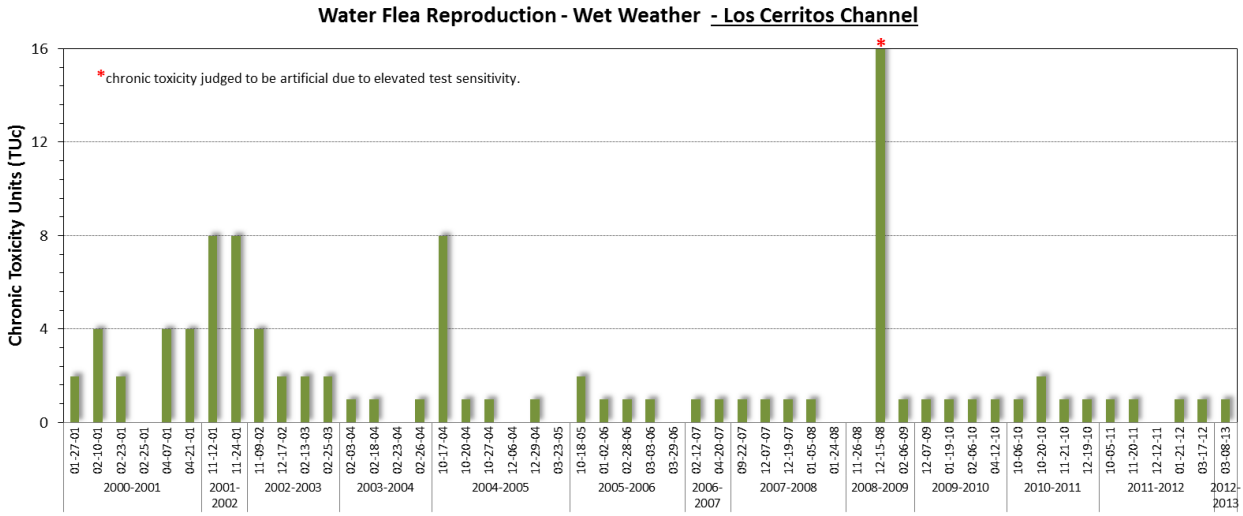


Figure 2-7. Chronic Toxicity of Stormwater Discharge to Water Flea Reproduction 2000 to 2013

Table 2-1. Summary of TSS, metals, bacteria and selected organophosphate pesticides measured in stormwater runoff at the Los Cerritos Channel Mass Emission

Date	TSS (mg/L)	Diss Cd (µg/L)	Total Cd (µg/L)	Diss Cu (µg/L)	Total Cu (µg/L)	Diss Pb (µg/L)	Total Pb (µg/L)	Diss Zn (µg/L)	Total Zn (µg/L)	Enterococcus MPN/100mL	Fecal Coliform MPN/100mL	Total Coliform MPN/100mL	Chlorpyrifos	Diazinon	Malathion
1/27/2001	260	0.25U	1.7	11	29	1.1	59	42	250		5000	110000	0.5U	0.5U	0.5U
2/10/2001	260	0.25U	0.81	11	30	0.5U	34	75	290		8000	50000	0.5U	0.5U	0.5U
2/23/2001	210	0.25U	1.3	12	30	1.1	52	51	290		30000	170000	0.5U	0.5U	0.5U
4/7/2001	350	0.21J	3.3	3.6	44	0.5	44	66	960		28000	90000	0.5U	0.5U	0.5U
4/21/2001	170	0.55	1.8	12	30	1.4	35	150	420		50000	300000	0.025U	0.21	0.27J
11/13/2001	1700	0.125U	5.5	7.4	90	3.1	370	48	1500	13210	50000	160000	0.025U	0.005U	0.5U
11/25/2001	200	0.125U	1.6	7.9	36	1.7	43	78	770	7520	50000	160000	0.28	0.41	0.5U
11/10/2002	110	0.36	0.59	19	27	7.6	16	160	180	1178	11000	80000	0.025U	0.2	0.5U
12/17/2002	450	0.125U	2.9	8.1	91	1.4	120	60	680	6670	90000	160000	0.025U	0.11	0.5U
2/13/2003	220	0.125U	1.0	5.0	46	0.79	31	35	250	144	3000	50000	0.025U	0.12	0.5U
2/25/2003	130	0.125U	0.61	5.6	20	0.97	22	63	160	4400	11000	160000		0.13	
2/3/2004	314	0.16	2.6	7.2	62	0.82	93	55	590	24400	13000	24000	0.025U	0.071	0.5U
2/18/2004	166	0.19	2.0	12	58	1.0	59	71	490	93000	130000	130000	0.025U	0.025U	0.5U
2/23/2004	48	0.12	0.62	5.0	17	0.48	19	52	210	12800	8000	30000	0.025U	0.025U	0.5U
2/26/2004	80	0.099J	0.66	4.4	27	0.61	20	37	180	9650	3000	13000	0.025U	0.025U	0.5U
3/3/2004	110														
10/17/2004	940	0.125U	8.3	12	240	3.3	210	130	2600				0.06	0.66	0.93
10/20/2004	130	0.12J	1.2	5.7	27	0.65	26	32	240	94000	70000	900000	0.55	0.05U	0.18
10/27/2004	170	0.125U	0.8	3.5	22	0.4J	28	11	180	35000	9000	90000	0.025U	0.025U	0.2
12/6/2004	69														
12/30/2004	350	0.057	1.2	3.9	39	0.32J	55	9.8	360	39000	22000	240000	0.025U	0.2	0.084
12/31/2004	210														

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

2.5

Date	TSS (mg/L)	Diss Cd (µg/L)	Total Cd (µg/L)	Diss Cu (µg/L)	Total Cu (µg/L)	Diss Pb (µg/L)	Total Pb (µg/L)	Diss Zn (µg/L)	Total Zn (µg/L)	Enterococcus MPN/100mL	Fecal Coliform MPN/100mL	Total Coliform MPN/100mL	Chlorpyrifos	Diazinon	Malathion
1/8/2005	130														
1/10/2005	86														
1/11/2005	220														
1/28/2005	148														
2/12/2005	150														
10/18/2005	370	0.22	1.4	12	46	1.7	38	120		158000	1600000	1600000	0.005U	0.005U	0.299
1/2/2006	73	0.12J	0.6	5.7	21	0.66	13	49	180	9590	13000	90000	0.01U	0.01U	0.19
2/19/2006	320														
2/28/2006	75	0.12J	0.5	6.9	22	0.92	13	53	170	15500	30000	160000	0.005	0.005U	0.0389
3/3/2006	410	0.059J	1.5	4.8	63	0.5U	61	20	500	7900	24000	50000	0.001U	0.002U	0.003
3/29/2006	96														
4/5/2006	63														
4/15/2006	97														
10/14/2006	504														
2/11/2007	190	0.071J	1.1	10	57	0.86	28	78	450	109	300	2800	0.001U	0.002U	0.003
2/19/2007	100														
4/21/2007	280	0.12U	1.7	12	78	1.5	93	91	630	9950	8000	50000	0.001U	0.0232	0.165
9/22/2007	680	0.067	3.4	17	160	3	90	130	1300	1200	2400	11000	0.001U	0.002U	0.5126
12/8/2007	64	0.12U	0.3	11	22	0.92	8.3	74	150	13000	1536	3820	0.001U	0.027	0.1696
12/19/2007	100	0.081	0.47	9.1	23	0.76	14	49	180	21000	17000	160000	0.001U	0.002U	0.086
1/6/2008	80	0.074	0.17	6.8	10	0.44	3.0	42	76	8100	1400	90000	0.001U	0.002U	0.003
1/24/2008	230														
1/27/2008	120														

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Date	TSS (mg/L)	Diss Cd (µg/L)	Total Cd (µg/L)	Diss Cu (µg/L)	Total Cu (µg/L)	Diss Pb (µg/L)	Total Pb (µg/L)	Diss Zn (µg/L)	Total Zn (µg/L)	Enterococcus MPN/100mL	Fecal Coliform MPN/100mL	Total Coliform MPN/100mL	Chlorpyrifos	Diazinon	Malathion
2/4/2008	43														
2/23/2008	17.3														
12/15/2008	150	0.077	0.45	7.4	26	0.34	13	26	160	25000	50000	90000	0.001U	0.002U	0.2866
2/6/2009	190	0.078	0.71	8.1	33	1.1	21	46	230	18000	3000	30000	0.001U	0.002U	0.1617
2/14/2009	226														
10/14/2009	170	0.067	0.89	15	58	1.8	33	85	400	35000	1600000	1600000	0.001U	0.002U	0.1431
12/8/2009	170	0.071	0.69	9.3	42	0.76	20	61	290	4700	5000	22000	0.001U	0.002U	0.1452
1/19/2010	170	0.043	0.54	4.9	32	0.37	71	20	210	18000	24000	160000	0.00U1	0.002U	0.1013
1/27/2010	116.5														
2/6/2010	270	0.083	0.25	3.1	12	0.2J	10	9.3	99	5400	8000	24000	0.001U	0.0216	0.003
3/7/2010	61.3														
4/12/2010	150	0.051	0.54	6.3	23	0.45	19	34	180				0.001U	0.002U	0.1919
10/6/2010	1100	0.048	2.2	13	150	2.0	63	30	960				0.001065	0.00213	0.211
10/20/2010	540	0.062	1.9	12	100	1.6	66	42	690	72000	30000	500000	0.00125	0.0025	0.325
10/30/2010	200														
11/21/2010	140	0.069	0.62	11	42	0.77	20	45	270	6600	3000	24000	0.011	0.0042	0.03
12/19/2010	52	0.049	0.20	4.5	12	0.35	5.5	28	85	6900	16000	50000	0.0016	0.0016	0.05
1/30/2011	108														
2/16/2011	99														
2/26/2011	66														
3/20/2011	46														
10/5/2011	260	0.18	1.4	13	78	1.6	37	64	560	14000	140000	1600000	0.005U	0.01U	0.025U

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Date	TSS (mg/L)	Diss Cd (µg/L)	Total Cd (µg/L)	Diss Cu (µg/L)	Total Cu (µg/L)	Diss Pb (µg/L)	Total Pb (µg/L)	Diss Zn (µg/L)	Total Zn (µg/L)	Enterococcus MPN/100mL	Fecal Coliform MPN/100mL	Total Coliform MPN/100mL	Chlorpyrifos	Diazinon	Malathion
11/12/2011	68														
11/21/2011	160	0.064	0.68	7.1	39	0.57	26	37	290	5500	220000	220000	0.001U	0.0014	0.025U
1/21/2012	53	0.12U	0.35	7.4	19	0.39	9.3	44	130	4100	3300	35000	0.0014	0.00075U	0.03
3/17/2012	370	0.1U	0.78	8.6	58	0.63	43	41	390	9200	160000	160000	0.0051	0.00075U	0.025U
3/26/2012	120														
3/8/2013	410	0.05J	0.87	6.0	51	0.25	46	33	390	7700	54000	54000	0.0047	0.0015U	0.05U

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Table 2-2. Summary of TSS, metals, bacteria and selected organophosphate pesticides measured in dry weather runoff at the Los Cerritos Channel Mass Emission Site.

Date	TSS (mg/L)	Diss Cd (µg/L)	Total Cd (µg/L)	Diss Cu (µg/L)	Total Cu (µg/L)	Diss Pb (µg/L)	Total Pb (µg/L)	Diss Zn (µg/L)	Total Zn (µg/L)	Enterococcus MPN/100mL	Fecal Coliform MPN/100mL	Total Coliform MPN/100mL	Chlorpyrifos (µg/L)	Diazinon (µg/L)	Malathion (µg/L)
6/5/2001	14	0.2	1.1	14	19	2.4	3.1	13	23		13000	160000	0.05U	0.22	0.1U
8/16/2001	58	0.5	0.57	16	17	3.2	3.5	39	43		2300	30000	0.05U	0.096	0.1U
5/9/2002	2	0.25	0.36	16	22	0.5	0.78	9.3	17	910	1100	3000	0.05U	0.32	1U
9/5/2002	18	0.25	0.25	6.7	10	0.58	1.2	9	12	3300	8000	24000	0.05U	0.01U	1U
5/20/2003	4	0.43	0.44	14	16	1.2	1.3	19	13	20300	30000	160000	0.05U	0.05U	1U
9/10/2003	56	0.25	0.27	3.4	15	0.57	6.5	17	92	600	1100	24000	0.05U	0.064	1U
5/5/2004	128	0.23	0.85	7.7	26	0.6	17	8.8	190	3200	4000	110000	0.05U	0.05U	1U
8/31/2004	41	0.25	0.29	9.8	16	0.71	6.8	8.2	33	3100	5000	16000	0.05U	0.71	1U
5/25/2005	11	0.31	0.42	8.4	11	0.7	1.2	14	22	1440	80	2400	0.05U	0.01U	1U
8/18/2005	44	0.2	0.26	12	17	0.6	2.8	43	40	4200	3000	50000	0.01U	0.01U	0.01U
5/11/2006	72	0.23	0.32	15	22	1.1	3.6	19	68	57600	2100	30000	0.002U	0.004U	0.006U
9/7/2006	38	0.046	0.096	7.5	14	0.74	1.5	6.7	22	2400	5000	26000	0.002U	0.004U	0.006U
5/17/2007	20	0.25	0.29	12	19	0.8	1.8	13	24	9900	16000	24000	0.002U	0.004U	0.006U
9/26/2007	2.2	0.26	0.29	27	29	0.78	1.1	17	21	600	240	2400	0.002U	0.004U	0.006U
5/7/2008	11	0.16	0.18	11	12	0.64	0.94	8.3	12	940	1100	3000	0.002U	0.0085	0.006U
7/2/2008	69	0.083	0.21	5.7	13	0.54	3.1	7.2	33	210	2200	16000	0.002U	0.004U	0.006U
5/7/2009	6.8	0.16	0.2	13	14	1.1	1.4	13	16	910	2400	5000	0.002U	0.004U	0.006U
10/13/2009	13	0.054	0.16	9.2	13	0.51	1.5	15	33	220	230	300	0.002U	0.004U	0.006U
5/12/2010	13	0.2	0.24	17	21	0.94	1.7	11	21	1700	90	1300	0.002U	0.004U	0.006U
9/23/2010	6.6	0.17	0.19	6.6	8.4	0.84	0.99	6.3	9.5	60	80	300	0.002U	0.004U	0.006U
5/11/2011	6.4	0.35	0.46	21	25	2	3.9	21	29	10	1300	79000	0.002U	0.0015U	0.05U
9/14/2011	10	0.34	0.47	13	18	0.34	1.3	5.7	15	280	2300	1700	0.002U	0.0015U	0.05U
5/2/2012	8.4	0.3	0.31	18	20	0.73	1.1	12	16	210	18	18	0.005U	0.0025	0.05U

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Date	TSS (mg/L)	Diss Cd (µg/L)	Total Cd (µg/L)	Diss Cu (µg/L)	Total Cu (µg/L)	Diss Pb (µg/L)	Total Pb (µg/L)	Diss Zn (µg/L)	Total Zn (µg/L)	Enterococcus MPN/100mL	Fecal Coliform MPN/100mL	Total Coliform MPN/100mL	Chlorpyrifos (µg/L)	Diazinon (µg/L)	Malathion (µg/L)
9/13/2012	11	0.086	0.12	15	19	0.55	0.94	7.5	14	7700	230	230	0.00036U	0.0015U	0.05U
5/1/2013	7.5	0.18	0.2	9.4	11	0.93	1	13	14	860	170	1700	0.002U	0.0015U	0.05U

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Table 2-3. Available Freshwater Benchmarks and Guidelines Used to Evaluate Quality of Wet and Dry Season Discharges from the Mass Emission Sites.

	Long Beach	LA Basin Plan	California Toxics Rule		California Fish and Game	
	2013	Acute	Chronic	Acute	Chronic	Acute
Analyte Group	ML[4]	Max. Level	CCC [2]	CMC [2]	CCC	CMC
Bacteria (MPN/100 ml) –Freshwater						
E. coli		235				
Conventionals (mg/L unless noted)						
pH (pH Units)	0.1	[6.5 - 8.5]				
MBAS	0.025	0.5				
Nitrate (as N)	0.1	10				
Nitrite (as N)	0.1	1				
Total Ammonia (as N)	0.1	- [1]				
Dissolved Metals (µg/L)						
Arsenic	0.5		150	340		
Cadmium[3]	0.2		2.2	4.3		
Copper	0.5		5.0	7.0		
Lead[3]	0.2		1.2	30		
Nickel	0.5		29	260		
Silver	0.2			3.4		
Zinc	1		66	65		
Total Metals (µg/L)						
Aluminum	25	1000				
Cadmium	0.25	5				
Chromium	0.5	50				
Nickel	0.5	100				
Selenium	1	50	5	20		

1. The one-hour average ammonia-N criterion applicable to storm events is pH dependent. The 30-day ammonia-N criterion applicable to dry weather is both temperature and pH dependent.

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

2. CTR freshwater dissolved metals are hardness dependent. The values listed here are computed for a hardness of 50 mg/L which is consistent with typical hardness values associated with stormwater runoff.
3. CTR freshwater dissolved cadmium and lead coefficients for conversion of total recoverable to dissolved criteria are also hardness dependent. Cadmium benchmarks are based on a hardness of 100 mg/L.
4. The detection limits (also MLs) used during the 2012-13 City of Long Beach MS4 Monitoring Program are provided to provide a reference point for the ability to interpret water quality measurements relative to available water quality criteria.

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Table 2-3. Available Freshwater Benchmarks and Guidelines Used to Evaluate Quality of Wet and Dry Season Discharges from the Mass Emission Sites (continued).

	Long Beach	LA Basin Plan	California Toxics Rule		California Fish and Game		UC Davis	
	2013	Acute	Chronic	Acute	Chronic	Acute	Chronic	Acute
Analyte Group	ML	Max. Level	CCC *	CMC *	CCC	CMC	CCC	CMC
Aroclors (µg/L)								
Aroclor 1016	0.02	0.5						
Aroclor 1221	0.02	0.5						
Aroclor 1232	0.02	0.5						
Aroclor 1242	0.02	0.5						
Aroclor 1248	0.02	0.5						
Aroclor 1254	0.02	0.5						
Aroclor 1260	0.02	0.5						
Chlorinated Pesticides (µg/L)								
4,4'-DDT	0.005		0.001	1.1				
Aldrin	0.005			3				
Dieldrin	0.005		0.056	0.24				
Endrin	0.005	2	0.036	0.086				
gamma-BHC (Lindane)	0.005			0.95				
Endosulfan I	0.005		0.056	0.22				
Endosulfan II	0.005		0.056	0.22				
Heptachlor	0.005	0.01	0.0038					
Heptachlor epoxide	0.005	0.01	0.0038					
Total Chlordane	0.005	0.1	0.0043	2.4				
Methoxychlor	0.005	40						
Mirex	0.005						0.001	
Toxaphene	0.05	2	0.0002					
Organophosphates (µg/L)								
Chlorpyrifos	0.002				0.014	0.02	0.0056	0.011
Diazinon	0.004				0.05	0.08	0.17	0.82
Malathion	0.006				0.1	0.43	0.028	0.17
Atrazine	0.01	3						
Simazine	0.01	4						
Pyrethroids (ng/L)								

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Bifenthrin	1.5	3			0.6	4
Cyfluthrin	1.5	2			0.05	0.3
Cypermethrin	1.5				0.2	1
L-Cyhalothrin	1.5				0.5	1
Permethrin	15				2	10
Total Deltamethrin/Tralomethrin	3					
Total Esfenvalerate/Fenvalerate	1.5					

Table 2-4. Saltwater Benchmarks and Guidelines Used to Evaluate Quality of Wet and Dry Season Discharges from the Mass Emission Sites.

	Long Beach	California Ocean Plan			California Toxics Rule		California Fish and Game		UC Davis	
Analyte Group	2013 ML	Instantaneous Single Sample	Daily Maximum	30-day Average	Chronic CCC	Acute CMC	Chronic CCC	Acute CMC	Chronic CCC	Acute CMC
Bacteria (MPN/100 ml)										
Enterococcus	10	104								
Fecal Coliform	20	400								
Total Coliform	20	10000								
Ratio of Fecal to Total Coliform		FC/TC≥0.1 & TC>1000								
Conventionals (mg/L unless noted)										
pH (pH Units)	0.1		[6.0 - 9.0]							
Total Ammonia (as N)	0.1		2.4							
Dissolved Metals (µg/L)										
Arsenic	0.5				36	69				
Cadmium	0.2				9.3	42				
Copper	0.5				3.1	4.8				
Lead	0.2				8.1	210				
Nickel	0.5				8.2	74				
Selenium	1				71	290				
Silver	0.2				-	1.9				
Zinc	1				81	90				
Total Metals (µg/L)										
Arsenic	0.5	80	32							
Cadmium	0.2	10	4							
Copper	0.5	30	12							
Lead	0.2	20	8							

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Nickel	0.5	50	20			
Selenium	1	150	60			
Silver	0.2	7	2.8			
Zinc	1	200	80			
Aroclors (µg/L)						
Total Aroclors			0.000019			

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Table 2-4. Saltwater Benchmarks and Guidelines Used to Evaluate Quality of Wet and Dry Season Discharges from the Mass Emission Sites. (continued)

	Long Beach	California Ocean Plan			California Toxics Rule		California Fish and Game		UC Davis	
	2001-2011	Instantaneous	Daily	30-day	Chronic	Acute	Chronic	Acute	Chronic	Acute
Analyte Group	**ML**	**Single Sample**	**Maximum**	**Average**	**CCC**	**CMC**	**CCC**	**CMC**	**CCC**	**CMC**
Chlorinated Pesticides (µg/L)										
4,4'-DDT	0.005				0.001	0.13				
Aldrin	0.005			0.000022		1.3				
Dieldrin	0.005			0.00004		0.71				
Endrin	0.005		0.004			0.037				
gamma-BHC (Lindane)	0.005					0.16				
Endosulfan I	0.005		0.018			0.034				
Endosulfan II	0.005		0.018			0.034				
Heptachlor	0.005			0.00005		0.053				
Heptachlor epoxide	0.005			0.00002		0.053				
Total Chlordane	0.005				0.004	0.09				
Methoxychlor	0.005									
Mirex	0.005									0.001
Toxaphene	0.05			0.00021		0.21				
Organophosphates (µg/L)										
Chlorpyrifos	0.002						0.009	0.02	0.0056	0.011
Malathion	0.006						0.1	0.34	0.028	0.17
Pyrethroids (ng/L)										
Bifenthrin	1.5								0.6	4
Cyfluthrin	1.5								0.05	0.3
Cypermethrin	1.5								0.2	1
L-Cyhalothrin	1.5								0.5	1
Permethrin	15								2	10
Total Deltamethrin/Tralomethrin	3									
Total Esfenvalerate/Fenvalerate	1.5									

Notes to Table 2-3 and 2-4:

General

Minimum Level (ML) is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Criteria continuous concentration (CCC) equals the highest concentration of pollutant to which aquatic life can be exposed for an extended period of time without deleterious effects.

Criteria maximum concentration (CMC) equals the highest concentration of pollutant to which aquatic life can be exposed for a short period of time with deleterious effects.

California Toxics Rule

U=analyte not detected at the associated detection limit.

J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

CTR freshwater dissolved metals are hardness dependent. The values listed here are computed for a hardness of 50 mg/L.
CTR freshwater dissolved cadmium and lead conversion coefficients for changes from total to dissolved bases are also hardness dependent.
CTR freshwater and saltwater dissolved metal criteria are "CCC" except for silver which are "CMC".
CTR freshwater and saltwater organics are "CCC" except for aldrin and gamma-BHC which are "CMC".

Ocean Plan and LA Basin Plan

Bacteria are instantaneous or single sample criteria.
LA Basin Plan contains Title 22 Drinking Water standards
Ammonia listed is Acute 1-hour average objective for waters not designated COLD and/or MIGR and is pH dependent. The value listed is for a pH of 7.5. Chronic criteria are applied to Dry Weather results and are pH and temperature dependent

California Fish and Game

All values are "CMC" criteria. CMCs are considered acute criteria.

U=analyte not detected at the associated detection limit.
J=value is considered an estimate. This is most commonly encountered when the analyte is measured at a concentration exceeding the detection limit but below the reporting limit.

Table 2-5. Comparison of the use of Toxicity Units and the TST procedure for triggering Phase 1 TIE tests.

Station	Date	NOEC[a]	Median Response[b]	TU_a[c]	TU_c[d]	TST[e]	% effect at IWC[f]
Los Cerritos	9/23/10	50	>100	<1.0	2.0	Fail	30.7
Los Cerritos	10/6/10	100	>100	<1.0	1.0	Pass	
Los Cerritos	10/20/10	50	>100	<1.0	2.0	Fail	49.4
Los Cerritos	11/21/10	100	>100	<1.0	1.0	Pass	
Los Cerritos	12/19/10	100	>100	<1.0	1.0	Fail	19.1
Los Cerritos	5/11/11	100	>100	<1.0	1.0	Pass	
Los Cerritos	9/14/11	100	>100	<1.0	1.0	Pass	
Los Cerritos	10/6/11	100	>100	<1.0	1.0	Pass	
Los Cerritos	11/20/11	100	>100	<1.0	1.0	Pass	
Los Cerritos	1/21/12	100	>100	<1.0	1.0	Pass	
Los Cerritos	3/17/12	100	>100	<1.0	1.0	Pass	
Los Cerritos	5/2/12	100	>100	<1.0	1.0	Pass	
Los Cerritos	9/13/12	100	>100	<1.0	1.0	Pass	
Los Cerritos	3/8/13	100	>100	<1.0	1.0	Pass	
Los Cerritos	5/1/13	50	86.5	1.2	2.0	Fail	65.7

Test results indicating where a TIE would have been performed using the TST method (TST failure and >50% effect) but was not indicated with the NOEC approach are highlighted in blue. The TST indicated that the test failed and the %effect was greater than 50%. Test results showing failure of the TST that would not have triggered at TIE based upon the NOEC approach are highlighted in red.

[a] No Observed Effect Concentration: the highest concentration with a test response not significantly different from the control.
[b] Concentration causing 50% inhibition in water flea reproduction (IC_{50}).
[c] Acute toxicity units = $100/IC_{50}$.
[d] Chronic toxicity units = 100/NOEC.
[e] Test of Significant Toxicity.
[f] IWC = Instream Waste Concentration (100% receiving water)

Table 2-6. TMDL Load Limitations and Measured Loads at the Los Cerritos Monitoring Site during Storm Events.

		TMDL Load Limits (ug/L)		
		Total Copper	Total Lead	Total Zinc
		9.8	55.8	95.6

		TMDL Load Limits (kilograms/day)			Total Measured Loads (kilograms/day)			Exceedance Factors (TMDL Load Limit/Measured Load)		
Season	**Total Flow (cf)**	Total Copper	Total Lead	Total Zinc	Total Copper	Total Lead	Total Zinc	Total Copper	Total Lead	Total Zinc
2011-2012	2.07E+08	2.0	11.6	19.8	16.2	7.7	116	8.0	0.7	5.9
	2.99E+08	2.9	16.7	28.6	11.6	7.8	86	4.0	0.5	3.0
	2.36E+08	2.3	13.2	22.6	4.5	2.2	31	1.9	0.2	1.4
	1.8E+08	1.8	10.1	17.2	10.4	7.7	70	5.9	0.8	4.1
2012-2013	2.60E+08	2.6	14.5	24.9	13.3	12.0	102	5.2	0.8	4.1

2.2 Waterbody – Pollutant Classification

Part VI.C.5.a of Order No. R4-2012-0175 requires Permittees to "identify the water quality priorities within each WMA that will be addressed by the Watershed Management Program. At a minimum, these priorities shall include achieving water quality-based effluent limitations and/or receiving water limitations established pursuant to TMDLs, as set forth in Part VI.E and attachments L through R of this Order." The Permit also specifies that each WMP shall include an evaluation of existing water quality conditions, including characterization of stormwater and non-stormwater discharges from the MS4 and receiving water quality.

The permit further requires Permittees to designate three categories of priority pollutants to be addressed by the WMP. Two of these categories are clearly defined. Category 1 (Highest Priority) is to include waterbody-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and attachments L through R of the order. Category 1 pollutants are discussed in Section 2.2.1 of this plan. Category 2 (High Priority) pollutants are those for which water quality data indicate a water quality-impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment. Category 2 pollutants are discussed in Section 2.2.2 of this plan.

The third category is not as clearly defined as the first two categories. Category 3 (Medium Priority) is defined to include 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 Order and for which MS4 discharges may be causing or contributing

to exceedances. This definition is too broad for a watershed with only a few scattered exceedances for some constituents. This plan proposes a screening process based on three criteria to separate medium priority pollutants from those we consider to be low priority at this time. Category 3 pollutants are discussed in Section 2.2.3 of this plan.

2.2.1 Identification of Category 1 (Highest Priority) Pollutants

Section VI.C.5.a.ii(1) of the Order defines highest priority pollutants as:

> Waterbody-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and attachments L through R of this Order.

Category 1 Pollutants from two sets of TMDLs apply directly and indirectly to the Los Cerritos Channel Watershed. The Los Cerritos Channel Metals TMDLs, established by USEPA in March 2010 created waste load allocations for copper, lead, and zinc in the Los Cerritos Channel Freshwater Watershed. The compliance point for these TMDLs is the City of Long Beach monitoring station at Stearns Street upstream of the terminus of the concrete lined flood control channel. The USEPA-established TMDLs do not have implementation plans or schedules. However, the Los Angeles Regional Water Board adopted a Basin Plan Amendment on June 6, 2013. This BPA contains an implementation schedule with both interim and final compliance dates. The final compliance date is September 30, 2026. Interim milestone compliance dates occur on September 30, 2017, September 30, 2020, and September 30, 2023. Only the September 30, 2017 milestone date occurs within the term of Order No R4-2012-0175. (See Table 2-9.)

The set of TMDLs that apply indirectly to the Los Cerritos Channel Watershed are contained in the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL. A draft monitoring plan for this TMDL has been prepared and monitoring commenced in September 2014. Three monitoring locations have been established in San Pedro Bay. The results of the monitoring at these sites will guide future monitoring at the mouth of the Los Cerritos Channel, and forensic monitoring within the watershed. Future implementation of control measures within the watershed could also be influenced by the results of the San Pedro Bay monitoring. The monitoring database also includes occasional, isolated exceedances that could have resulted from field or laboratory errors. (See Table 2-10.)

2.2.2 Identification of Category 2 (High Priority) Pollutants

Section VI.C.5.9.ii(2) of the Order defines high priority pollutants as:

> 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 Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment.

Five pollutants are considered Category 2 (High Priority) pollutants for the Los Cerritos Channel. These are ammonia, bis(2-ethylhexyl)phthalate (DEHP), coliform bacteria, trash, and pH. They were added to the 303(d) list in 2002, 2006, and 2010. Ammonia has been proposed for delisting, but it is not clear when this might happen. (See Table 2-11.)

For one other metal, aluminum, although there have been many exceedances of water quality standards during the past 10 years, these exceedances are based on secondary drinking water standards because State Board Resolution No. 88-63 (Sources of Drinking Water) and Regional Board Resolution No. 89-03 (Incorporation of Sources of Drinking Water Policy into the Water Quality Control Plans (Basin Plans) resulted in all surface and ground waters being considered suitable, or potentially suitable, for municipal water supply. The aluminum in Los Cerritos Channel stormwater is naturally occurring in the suspended sediment and the water used for municipal water supplies would be filtered to remove the sediment. (See Table 2-13) In addition, the Channel is designated in the Basin Plan with a potential MUN beneficial use with an asterisk, meaning that the use may be considered for an exemption at a later date. Therefore, aluminum is considered a low priority pollutant at this time.

2.2.3 Identification of Category 3 (Medium Priority) Pollutants

Section VI.C.5.a.ii(3) of the Order defines medium priority pollutants as:

> "Pollutants for which there are insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in this Order and for which MS4 discharges may be causing or contributing to the exceedance."

This is a very broad definition for a watershed with 13 years of water quality monitoring data, including exceedances in the past for constituents that are no longer sold in metropolitan areas in California (e.g., diazinon and chlorpyrifos), as well as other constituents that have long since been banned for sale in the United States. Some of these constituents left significant, long-lasting residue in the environment (particularly in marine sediments and fish tissue) and are generally referred to as legacy pollutants. Several of these legacy pollutants, including chlordane, DDT, PAHs, and PCBs, are being addressed through the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL. (See Table 2-10.)

In order to account for the diversity of data in the database and focus its efforts on priority pollutants, the Watershed Group decided to employ three criteria to define Category 3 Medium Priority Pollutants. First, in order to be consistent with the current/baseline pollutant loading to be used in the Reasonable Assurance Analysis for the Watershed Management Program, only the last 10 years of monitoring data have been used in determining Category 3 priority pollutants. Second, the number of exceedances for both dry weather and wet weather has been compared to Tables 3.1 and 3.2 of the State's Listing Policy to determine the percentage of the minimum number of measured exceedances

needed to place a water segment on the Section 303(d) List for toxicants and for conventional pollutants. A mid-range of 50% was selected as the cut-off point for considering a pollutant a candidate for designation as a Category 3 Priority Pollutant, and to be conservative, wet and dry weather exceedances are considered separately. Lastly, in order to avoid giving priority to a pollutant based on an exceedance that could have been the result of a field or laboratory error, only pollutants with two exceedances in the last five years have been placed on the initial Category 3 Medium Priority Pollutant List. This process will be revisited as part of the Adaptive Management Process.

The data used to determine which pollutants are included in Category 3 Priority Pollutants is presented in Tables 2-7 and 2-8. One table presents wet-weather monitoring data and the other includes dry-weather monitoring data. Both tables include data for the 2003-2004 rain year through the 2012-2013 rain year. They are both based on regulatory standards for freshwater Non-Regulatory Standards discussed later in this section.

Table 2-7 presents the wet-weather monitoring data analyzed to help determine which pollutants were classified as Category 3 Medium Priority Pollutants. As shown in the table, enterococcus, fecal coliform, total coliform, aluminum, total chlordane, dissolved copper, dissolved zinc, and chlorpyrifos all have 100% or more of the required number of measured exceedances during wet-weather to be candidates for inclusion on the Category 3 list. All but chlorpyrifos have two or more exceedances during the last five years. In addition, MBAS, cadmium, chromium, Simazine, and dissolved silver have 50% of the exceedances required for listing. However, of this group only MBAS has two exceedances in the last five years.

As shown in Table 2-8, enterococcus, fecal coliform, total coliform, pH, and dissolved copper all have 100% or more of the required number of measured exceedances during dry weather to be candidates for inclusion on the Category 3 List. In addition, the single 2003-2004 exceedance for aluminum is 50% of the number of exceedances needed for listing of a toxicant per Table 3.1 of the Listing Policy. However, copper is already a Category 1 pollutant, coliform bacteria and pH are Category 2 pollutants, and the exceedances for enterococcus were based on saltwater standards – not freshwater standards. This was done to monitor enterococcus since the Los Cerritos Channel discharges into a saline estuary.

The resulting Category 3 list is shown in Table 2-12. This table shows the pollutants, the seasons of exceedances, the standards of exceedance, the percentage of required exceedances for listing per the State Listing Policy, proposed final wet-weather target dates, and notes that describe the exceedances. The pollutants on this table are the priority pollutants for which there is insufficient data to indicate water quality impairments.

2.2.4 Identification of Low Priority Pollutants

After review of pollutants for which there is insufficient data to indicate water quality impairment in the receiving water according to the State's Listing Policy in relation to the three criteria used to identify Category 3 Pollutants, the Watershed Group has identified six pollutants as low priority

pollutants at this time. These pollutants are shown in Table 2-13 that is structured in the same manner as Table 2-12. Three of these pollutants are metals that each showed one wet-weather exceedance in either 2003-04 or 2004-05. The other pollutants are two pesticides that have been banned for sale in urban areas. These are chlorpyrifos and diazinon, which both theoretically quality for 303(d) listing per the State's listing policy, but the last exceedances for both were in 2004-05. In addition, as noted above, aluminum has been included Table 2-13 and not being addressed at this time because it may be considered for an exemption in the Basin Plan at a later date.

2.2.5 Emerging Constituents of Concern

Over 84,000 industrial chemicals are currently being produced and at least 610 of these compounds have been identified as being both persistent and bioaccumulative. Many of these compounds have the potential to be transported into aquatic and marine habitats by way of stormwater discharges. Recent studies in San Francisco Bay and throughout California have identified a number of different compounds or groups of compounds as possible concerns. These include pyrethroid pesticides, Fipronil and its degradates, perfluorooctane sulfonate (PFOs), nonylphenols, and various flame retardants (chlorinated phosphates and PBDEs. Early identification and actions have already been effective at reducing accumulation of some of these compounds in sediments and tissues. The Watershed group is currently investigating potential presence of pyrethroids and Fipronil in stormwater. The Group will continue to review the literature concerning other constituents of concern and potentially modify the monitoring program or recommend further regional work under the Stormwater Monitoring Coalition effort as part of the adaptive management process.

2.3 Source Assessment

Pursuant to Part VI.C.5.iii of Order No. R4-2012-0175, this section includes a summary of known and suspected stormwater and non-stormwater pollutant sources. For Category 1 pollutants, emphasis has been given to the source assessment in the applicable TMDLs. For category 2 and 3 pollutants, emphasis has been given to source assessments in related TMDLs elsewhere in the Region and professional judgment based on interpretation of various sources, including those listed in Part VI.C.5.iii(1) of the Order.

2.3.1 Sources of Metals

The source assessment section of the Los Cerritos Channel Metals TMDLs provides a thorough overview of the potential sources of copper, lead, and zinc within the watershed. The TMDL states, "Individual sources of metals in stormwater include automobile brake pads, vehicle wear, building materials, pesticides, erosion of paint and deposition of air emissions from fuel combustion and industrial facilities." Air deposition is not the true source of many pollutants, but it is the secondary source for many pollutants, including copper, lead, and zinc. The Metals TMDLs estimated that indirect deposition of copper within the watershed is 531 kg/year, while indirect deposition of lead is 398

kg/year, and indirect deposition of zinc is 2,655 kg/year. The principal true source of copper is brake pads that are estimated to contribute 50-60% or more of the copper in urban runoff. The true sources of lead are many, but USEPA has estimated that half of the lead in urban area atmospheric deposition of lead is from avgas, the fuel used for piston engine aircraft. There are also many sources of zinc. However, two sources appear to be dominant: tires and galvanized metal. Zinc is used in the vulcanization of rubber and deposited directly and indirectly through atmospheric deposition.

A SCCWRP stormwater study conducted between 2001 and 2005 found that industrial land use sites contributed substantially higher fluxes and event mean concentrations (EMCs) of copper and zinc than other land use categories. Industrial sites typically have more than 70% impervious cover as well as on-site sources of metals, which may explain the higher loadings of copper and zinc from this land use. In addition, industrial sites, along with agricultural land uses, were found to contribute substantially higher fluxes of TSS than other land uses.

Industrial sites within the LCC Freshwater Watershed with stormwater permits include sites for trucking and warehousing, transportation equipment, fabricated metal products, petroleum and coal products, rubber and miscellaneous plastics products, oil and gas extraction, and other miscellaneous industries. There is a potential for metals loadings from each of these industries, particularly transportation and manufacturing facilities. Redevelopment of former industrial sites has a higher potential to discharge sediment containing metals.

2.3.2 Sources of Legacy Organics

The source assessment section of the staff report for the *Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants Total Maximum Daily Loads (Harbor Toxics TMDL)* provides an excellent assessment of the potential sources of legacy organics from the area tributary to the harbors and San Pedro Bay, including the Los Cerritos Channel Watershed portion of the Nearshore Area defined in the TMDLs. The source assessment identifies the potential sources of organochlorine pesticides, PCBs, sediment toxicity, PAHs, and metals. However, this WMP relies on the watershed-specific information in the Los Cerritos Channel Metals TMDL for its assessment of the potential sources of metals. The source assessment in the Harbor Toxics TMDL indicates that PAHs that are currently generated or deposited in the watersheds are then washed off and discharged into receiving waters. It generally views PCBs, DDT, dieldrin, toxaphene, and chlordane as legacy pollutants that remain ubiquitous within the environment, bound to fine-grained particles. However, the Watershed Group also considers PAHs to be partially a legacy pollutant because of their long history of release and binding to fine-grained particles. Like zinc from galvanized metal products, PAHs are ubiquitous within the urban environment. Some are naturally occurring, but most are anthropogenic and come from the release of petroleum products and combustion of organic matter. They are distributed across the Watershed by atmospheric deposition.

A major indirect source of these pollutants in the Los Cerritos Channel is the fine-grained sediment that becomes dislodged and transported through the storm drains and contributes significantly to the

TSS loads within the Channel. Some of this sediment is from construction sites and some is from streets, highways, and other impervious surfaces. However, much of it is from exposed soil in industrial facility sites, transmission line rights-of-way, freeway rights-of-way, hillside slopes, and vacant lots.

2.3.3 Sources of Category 2 Pollutants

Bis(2-ethylhexyl)phthalate (DEHP) and trash share sources, since DEHP is a plasticizer that most likely enters the receiving waters through the presence of plastic bottles and other plastic materials in trash. The State Water Board's December 2014 Proposed Final Draft Staff Report for the Proposed Draft Amendments to the Statewide Water Quality Control Plans notes that trash is related to the direct and indirect activities of Watershed inhabitants. The draft report lists five primary sources or transport mechanisms for trash to reach State waters:

1) Littering by the public on or adjacent to waterways

2) Storm events draining watersheds and carrying trash originating from littering, inadequate waste handling or illegal dumping via storm drain system to receiving waters

3) Wind-blown trash, also originating from littering, inadequate waste handling, or illegal dumping

4) Illegal dumping into or adjacent to waterbodies, and

5) Direct disposal (overboard disposal and/or dumping) of trash into waterbodies from vessels involved in commercial, military, fishing, or recreational activities.

The proposed amendments to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries recognizes the following land use categories as priority land uses for addressing trash: high density residential, industrial, commercial, mixed urban, and public transportation stations.

Coliform bacteria have many natural and anthropogenic sources. Pet waste, improper cleaning of restaurant floor mats, inclusion of food and food waste in trash, leaking wastewater tanks on motor homes, and homeless encampments are among the anthropogenic sources. Among the natural sources are wildlife and bird excrement and regrowth in enclosed pipes, behind trash nets, and under algal mats during low flow conditions. The sources of pH are associated with natural processes during dry weather with shallow water flowing over concrete surfaces in the presence of sunlight.

Ammonia in surface water can originate from many sources. Within the Los Cerritos Channel Watershed, the principal sources are probably land-applied manure and bio-solids, airborne ammonia, sediment discharges, wildlife feces, decay of aquatic organisms, and organic materials in the water.

2.3.4 Sources of Category 3 Pollutants

MBAS is a surfactant, and its sources within the Watershed are likely associated with the discharge of detergents and other cleaning products. Outdoor car washing and illicit discharges by cleaning services may be significant sources.

The sources of enterococcus within the Watershed are similar to the sources of coliform bacteria. However, a few species of enterococcus are associated with plants rather than fecal material. Enterococcus is used in the marine environment because it tends to correlate with viruses.

2.4 Priority and Sequencing of Addressing Water Quality Issues

The initial priority and sequencing of addressing water quality issues in the Los Cerritos Channel Watershed are related largely to four factors: 1) Interim TMDL milestone dates, 2) final TMDL compliance dates, 3) wet-weather compliance target dates for Category 2 and 3 pollutants, and 4) availability of money. The first priority is to address Category 1 pollutants with initial sequencing focused on copper, lead, and zinc, which are included in both the Los Cerritos Channel Metals TMDLs and the Harbor Toxics TMDL. By addressing the 2017, 2020, and 2023 interim milestones for copper, lead, and zinc in the metals TMDLs, and the final compliance date of September 30, 2026, the Watershed Group will also be addressing the metals in the Harbor Toxics TMDL. In addition, to the extent that TSS reduction and runoff reduction are employed to address metals, the legacy organics in the Harbor Toxics TMDL will also be addressed.

The second priority is to address methylene blue active substances (MBAS). Even though MBAS is a Category 3 pollutant, the Watershed Group proposes to address it early in order to eliminate the need to add it to the 303(d) List. The exceedances have generally been low, and it may be able to be handled through the inspection and education processes because it is a surfactant found in detergents used in commercial/industrial facility maintenance and in outdoor car washes.

The third priority for addressing water quality issues within the watershed is to address trash and Bis(2-ethylhexyl) phthalate through the installation of full capture systems in catch basins in high priority land use areas. DEHP will be addressed because it is a plasticizer and its presence in the receiving waters appears to be associated with the presence of plastic trash in the waters.

The fourth priority is to address pH and bacteria in dry-weather by reducing dry-weather discharges and reducing the nutrient discharges throughout the watershed. The pH issue is a natural dry-weather condition associated with algal growth in open concrete-lined channels with low flows of water exposed to bright sunlight. If the dry-weather flows can be eliminated through water conservation, infiltration, and capture and use, the cycle will be interrupted and the diurnal spikes in the pH will be eliminated. Furthermore, the elimination of dry-weather flows will reduce the transport of bacteria and possibly eliminate the algal substrate that facilitates bacteria growth within the open channels.

The fifth priority will be to address wet-weather bacteria. Fully addressing bacteria will be a complicated and expensive process that requires more research and possibly regulatory changes. Stormwater capture and infiltration or use is one method that will be used to address wet-weather bacteria control. Restaurant inspections, public education regarding cleaning up after pets, and biological treatment of runoff will also be employed. However, the Permittees within the Watershed are not confident that available tools will allow them to meet current regulatory standards. Therefore, the Watershed Group will investigate other possible control measures.

The Watershed Group believes that it can come into compliance with dry-weather bacteria standards within 10 years by greatly reducing or eliminating dry-weather discharges in the Los Cerritos Channel. This will eliminate bacteria problems for approximately 90% of the year. Milestones for achieving dry-weather standards are found in Section 6.

The Watershed Group does not currently understand how to meet bacteria standards during wet weather and will be requesting a high flow suspension for the recreational beneficial use for the Los Cerritos Channel during the next triennial review cycle, which we understand will be initiated soon. At the conclusion of that process, the Group should be able to provide interim milestones for meeting wet-weather standards as part of the adaptive management process.

The Watershed Group does not plan to address ammonia at this time because it has been proposed for delisting. The 13 years of data collected by the City of Long Beach at the mouth of Los Cerritos Channel and several special studies demonstrate that there are no measured wet-weather exceedances of wet-weather standards, and the few recent dry-weather chronic exceedances have been due to natural pH cycling in the greatly reduced dry-weather flows. Data in Attachment C, the "Review of Los Cerritos Channel Watershed Ammonia and pH Data – Implications of 303(d) Delisting" show that flows to the channels from outfalls during dry-weather are well within Basin Plan pH standards and that the diurnal cycles in pH are not the result of waste discharges. These data support the delisting of both ammonia and pH for the Los Cerritos Channel.

Table 2-7. Los Cerritos Channel Wet-Weather Exceedances 2003-4 through 2012-13 Rain Years

Constituent	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	Total Exceed-ances	Data Points	%*
BASIN PLAN CRITERIA													
Microbiology													
Enterococcus	4	3	4	3	4	2	4	3	4	1	32	32	>100
Fecal Coliform	4	3	4	2	4	2	4	3	4	1	31	32	>100
Total Coliform	4	3	4	2	3	2	4	3	4	1	30	32	>100
Conventionals													
MBAS	0	1	0	0	0	0	0	1	1	0	3	34	50
Nitrate (as N)	0	0	0	0	0	0	0	0	0	0	0	33	0
Nitrite (as N)	0	0	0	0	0	0	0	0	0	0	0	33	0
pH	0	0	0	1	0	0	0	0	0	0	1	41	20
Total Metals													
Aluminum	3	4	4	2	2	2	4	4	4	1	30	34	>100
Arsenic	0	0	0	0	0	0	0	0	0	0	0	34	0
Cadmium	0	1	0	0	0	0	0	0	0	0	1	34	50
Chromium	0	1	0	0	0	0	0	0	0	0	1	34	50
Nickel	0	0	0	0	0	0	0	0	0	0	0	34	0
Selenium	0	0	0	0	0	0	0	0	0	0	0	34	0
Aroclors													
Aroclor 1016	0	0	0	0	0	0	0	0	0	0	0	34	0
Aroclor 1221	0	0	0	0	0	0	0	0	0	0	0	34	0
Aroclor 1232	0	0	0	0	0	0	0	0	0	0	0	34	0
Aroclor 1242	0	0	0	0	0	0	0	0	0	0	0	34	0
Aroclor 1248	0	0	0	0	0	0	0	0	0	0	0	34	0
Aroclor 1254			0	0	0	0	0	0	0	0	0	26	0
Aroclor 1260	0	0	0	0	0	0	0	0	0	0	0	34	0
Chlorinated Pesticides													
Endrin	0	0	0	0	0	0	0	0	0	0	0	34	0
gamma-BHC (Lindane)	0	0	0	0	0	0	0	0	0	0	0	34	0
Heptachlor	0	0	0	0	0	0	0	0	0	0	0	34	0
Heptachlor epoxide	0	0	0	0	0	0	0	0	0	0	0	34	0
Methoxychlor	0	0	0	0	0	0	0	0	0	0	0	34	0
Total Chlordane	0	0	0	0	1	0	1	0	0	0	2	34	100
Toxaphene	0	0	0	0	0	0	0	0	0	0	0	34	0
Triazine													
Atrazine	0	0	0	0	0	0	0	0			0	27	0
Simazine	1	0	0	0	0	0	0	0			1	27	50

Constituent	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	Total Exceed-ances	Data Points	%*
CTR FRESH CMC													
Dissolved Metals													
Arsenic	0	0	0	0	0	0	0	0	0	0	0	34	0
Cadmium	0	0	0	0	0	0	0	0	0	0	0	34	0
Copper	4	2	4	2	3	2	5	4	4	1	31	34	>100
Lead	0	0	0	0	0	0	0	0	0	0	0	34	0
Nickel	0	0	0	0	0	0	0	0	0	0	0	34	0
Silver	0	0	0	0	0	0	1	0	0	0	1	34	50
Zinc	4	2	3	2	2	1	3	2	4	1	24	34	>100
Total Metals													
Selenium	0	0	0	0	0	0	0	0	0	0	0	34	0
Chlorinated Pesticides													
4,4'-DDT	0	0	0	0	0	0	0	0	0	0	0	34	0
Aldrin	0	0	0	0	0	0	0	0	0	0	0	34	0
Dieldrin	0	0	0	0	0	0	0	0	0	0	0	34	0
Endosulfan I	0	0	0	0	0	0	0	0	0	0	0	34	0
Endosulfan II	0	0	0	0	0	0	0	0	0	0	0	34	0
Endrin	0	0	0	0	0	0	0	0	0	0	0	34	0
gamma-BHC (Lindane)	0	0	0	0	0	0	0	0	0	0	0	34	0
Heptachlor	0	0	0	0	0	0	0	0	0	0	0	34	0
Heptachlor epoxide	0	0	0	0	0	0	0	0	0	0	0	34	0
Toxaphene	0	0	0	0	0	0	0	0	0	0	0	34	0
CDFG FRESH CMC													
Organophosphates													
Chlorpyrifos	0	2	0	0	0	0	0	0	0	0	2	34	>100

* Percentage of required exceedances for listing per the State Listing Policy

Table 2-8. Los Cerritos Channel Dry-Weather Exceedances 2003-04 through 2012-13 Rain Years

Constituent	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	Total Exceed-ances	Data Points	%*
BASIN PLAN													
Microbiology													
Enterococcus	2	2	2	2	2	2	2	0	2	2	18	20	>100
Fecal Coliform	2	1	2	2	1	2	0	1	1	0	12	20	>100
Total Coliform	2	1	2	2	0	1	0	1	0	0	9	20	>100
Conventionals													
MBAS	0	0	1	0	0	0	0	0	0	0	1	20	20
Nitrate (as N)	0	0	0	0	0	0	0	0	0	0	0	20	0
Nitrite (as N)	0	0	0	0	0	0	0	0	0	0	0	20	0
pH	1	2	3	4	3	2	2	1	2	1	21	20	>100
Total Metals													
Aluminum	1	0	0	0	0	0	0	0	0	0	1	20	50
Arsenic	0	0	0	0	0	0	0	0	0	0	0	20	0
Cadmium	0	0	0	0	0	0	0	0	0	0	0	20	0
Chromium	0	0	0	0	0	0	0	0	0	0	0	20	0
Nickel	0	0	0	0	0	0	0	0	0	0	0	20	0
Selenium	0	0	0	0	0	0	0	0	0	0	0	20	0
Aroclors													
Aroclor 1016	0	0	0	0	0	0	0	0	0	0	0	20	0
Aroclor 1221	0	0	0	0	0	0	0	0	0	0	0	20	0
Aroclor 1232	0	0	0	0	0	0	0	0	0	0	0	20	0
Aroclor 1242	0	0	0	0	0	0	0	0	0	0	0	20	0
Aroclor 1248	0	0	0	0	0	0	0	0	0	0	0	20	0
Aroclor 1254			0	0	0	0	0	0	0	0	0	20	0
Aroclor 1260	0	0	0	0	0	0	0	0	0	0	0	20	0
Chlorinated Pesticides													
Endrin	0	0	0	0	0	0	0	0	0	0	0	20	0
gamma-BHC (Lindane)	0	0	0	0	0	0	0	0	0	0	0	20	0
Heptachlor	0	0	0	0	0	0	0	0	0	0	0	20	0
Heptachlor epoxide	0	0	0	0	0	0	0	0	0	0	0	20	0
Methoxychlor	0	0	0	0	0	0	0	0	0	0	0	19	0
Total Chlordane	0	0	0	0	0	0	0	0	0	0	0	20	0
Toxaphene	0	0	0	0	0	0	0	0	0	0	0	20	0
Triazine													
Atrazine	0	0	0	0	0	0	0	0			0	15	0
Simazine	0	0	0	0	0	0	0	0			0	15	0

Constituent	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	Total Exceed-ances	Data Points	%*
CTR FRESH CCC													
Dissolved Metals													
Arsenic	0	0	0	0	0	0	0	0	0	0	0	20	0
Cadmium	0	0	0	0	0	0	0	0	0	0	0	20	0
Copper	0	0	1	0	1	1	1	1	2	1	8	20	>100
Lead	0	0	0	0	0	0	0	0	0	0	0	20	0
Nickel	0	0	0	0	0	0	0	0	0	0	0	20	0
Zinc	0	0	0	0	0	0	0	0	0	0	0	20	0
Total Metals													
Selenium	0	0	0	0	0	0	0	0	0	0	0	20	0
Chlorinated Pesticides													
4,4'-DDT	0	0	0	0	0	0	0	0	0	0	0	20	0
Aldrin	0	0	0	0	0	0	0	0	0	0	0	20	0
Dieldrin	0	0	0	0	0	0	0	0	0	0	0	20	0
Endosulfan I	0	0	0	0	0	0	0	0	0	0	0	20	0
Endosulfan II	0	0	0	0	0	0	0	0	0	0	0	20	0
Endrin	0	0	0	0	0	0	0	0	0	0	0	20	0
Heptachlor epoxide	0	0	0	0	0	0	0	0	0	0	0	20	0
Toxaphene	0	0	0	0	0	0	0	0	0	0	0	20	0
1.1.1.1.1.1 C FG FRESH CCC													
Organophosphates													
Chlorpyrifos	0	0	0	0	0	0	0	0	0	0	0	20	0
Diazinon	1	1	0	0	0	0	0	0	0	0	2	20	100

*Percentage of required exceedances for listing per the State Policy

Table 2-9. Los Cerritos Channel Watershed Priority Pollutants – Category 1 (Highest Priority)[1]

Los Cerritos Channel Metals TMDLs

Pollutant	Listing Date	TMDL	Final Wet-Weather Compliance Target Dates	Notes
Copper (Dry weather and wet weather)	2002	EPA-established TMDL March 17, 2010	September 30, 2026	74.7% reduction required by Metals TMDL.
Lead (Wet weather)	2002	EPA-established TMDL March 17, 2010	September 30, 2026	No further reduction required by Metals TMDL.
Zinc (Wet weather)	2002	EPA-established TMDL March 17, 2010	September 30, 2026	69.2% reduction required by Metals TMDL.

[1] Category 1 (Highest Priority): Water body-pollutant combinations for which quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R of this Order. (Order No. R4-2012-0175, p. 59)

Table 2-10. Los Cerritos Channel Watershed Priority Pollutants – Category 1 (Highest Priority)[1]

Greater Harbor Toxics TMDLs[2]

Pollutant	Listing Date	TMDL	Final Wet-Weather Compliance Target Dates	Notes[3]
Copper	1998	TMDL effective March 23, 2012	March 23, 2032	Addressed by LCC Metals TMDLs
Lead	1998	TMDL effective March 23, 2012	March 23, 2032	Addressed by LCC Metals TMDLs
Zinc	1998	TMDL effective March 23, 2012	March 23, 2032	Addressed by LCC Metals TMDLs
DDT (Fish tissue)	1996	TMDL effective March 23, 2012	March 23, 2032	Entire nearshore watershed is 0.7% of DDT loading to Greater Harbor waters. LCC Reduction required unknown.
PCBs (Fish tissue)	1996	TMDL effective March 23, 2012	March 23, 2032	Entire nearshore watershed is 0.2% of PCBs loading to Greater Harbor waters. LCC Reduction required unknown.
Chlordane (Fish tissue)	2006	TMDL effective March 23, 2012	March 23, 2032	Chlordane is primarily a legacy pollutant. A bed sediment concentration of 0.5 µg/kg dry sediment has been assigned to Eastern San Pedro Bay. LCC reduction required unknown.
PAHs (Sediment)	1998	TMDL effective March 23, 2012	March 23, 2032	Entire nearshore watershed is 5.8% of total PAHs loading to Greater Harbor waters. LCC Reduction required unknown.
Toxicity (Sediment)	1996	TMDL effective March 23, 2012	March 23, 2032	Entire nearshore watershed is 1.9% of sediment loading to the Greater Harbor Waters in wet conditions and 0.1% in dry conditions. LCC reduction required unknown.

[1]Category 1 (Highest Priority): Water body-pollutant combinations for which quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R of this Order. (Order No. R4-2012-0175, p. 59)
[2] Based on 303(d) listings for Los Angeles Harbor.
[3] Source of notes (other than those for metals) is table in linkage analysis section of Attachment A to Resolution No. R11-008.

Table 2-11. Los Cerritos Channel Watershed Priority Pollutants – Category 2 (High Priority)[1]

Pollutant[2]	Listing Date	State-Proposed TMDL Date	Estimated Final Wet-Weather Compliance Target Dates	Applicable Receiving Water Limitations	Notes
Ammonia	2002	2015	NA	0.1 mg/L	Proposed for de-listing
Bis(2) (DEHP)	2006	2019	2025	5.9 mg/L	Related to plastic trash
Coliform Bacteria	2002	2019	2040	235 MPN/100ml	Now only *E. Coli*
Trash	2006	2019	2025	Narrative standard related to nuisance or adversely affecting beneficial uses	Compliance by installation of full-capture devices in priority land use areas
pH	2010	2021	NA	[6.5 – 8.5][3]	Natural dry-weather condition

[1] 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 Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment. (Order No. R4-2012-0175, p. 59)

[2] The Channel is also listed as impaired for chlordane in sediment. However, chlordane is considered a Category 1 pollutant since it is included in the Greater Harbor Toxics TMDLs.

[3] In addition, ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge.

Table 2-12. Los Cerritos Channel Water Body–Pollutant Classification Category 3 (Medium Priority)[1]

Pollutant	Season of Exceedances	Standard of Exceedance	Percentage of Required Exceedance for Listing	Final Wet-Weather Compliance Target Dates	Applicable Receiving Water Limitations	Notes
MBAS	Dry weather and wet weather	Basin Plan	44% (54)[2]	2025	0.5 mg/L	Exceedances: 1 dry-weather in 10 years; none in the last 5 years. 3 wet-weather 10 years; 2 in the last 5 years The limit is 0.5 mg/L and the exceedances were generally low (0.57, 0.58, 0.60, and 0.88 mg/L).
Enter-ococcus[3]	Dry weather and wet weather	Basin Plan	>100% (52)[2]	2040	104 MPN/100 ml	Exceedances: 18 dry-weather in 10 years; 8 in the last 5 years. 32 wet-weather in 10 years; 14 in the last 5 years

[1] 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 this Order and for which MS4 discharges may be causing or contributing to the exceedance. Priority among pollutants that have exceeded standards during the last 10 years is for those for which exceedances have been greater than 50% of the number required for listing for either wet weather or dry weather and have exceeded standards are least twice in the last five years.

[2] Number of samples.

[3] Exceedances based on saline water standard. Included because channel discharges to saline estuary.

Table 2-13. Los Cerritos Channel Low Priority Pollutants Not Being Addressed at this Time

Pollutant	Season of Exceedances	Standard of Exceedance	Percentage of Required Exceedance for Listing	Final Wet-Weather Compliance Target Dates	Notes
Aluminum[1]	NA	NA	NA	NA	Exceedances: 1 dry-weather in 10 years; none in the last 5 years. 30 wet-weather in 10 years; 15 in the last 5 years Exceedances based on potential MUN beneficial use and secondary drinking water standard
Cadmium	Wet weather	Basin Plan	50% (54)[2]	NA	One wet weather exceedance in 2004-05
Chlorpyrifos[3]	Wet weather	CFW[4] FRESH CCC	100%(50)[2]	NA	Two wet-weather exceedances in 2004-05. No longer sold in area.
Chromium	Wet weather	Basin Plan	50% (54)[2]	NA	One wet-weather exceedance in 2004-05
Diazinon[3]	Dry weather and Wet weather	CFW[4] FRESH CCC	100%(50)[2]	NA	One wet-weather exceedance in 2003-04 and one dry-weather exceedance in 2004-05. No longer sold in area.
Dissolved Silver	Wet weather	CFW[4] FRESH CMC	50% (34)[2]	NA	One wet-weather exceedance in 2003-04

[1] The Channel is designated in the Basin Plan with a potential MUN beneficial use with an asterisk, meaning that the use may be considered for an exemption at a later date. Therefore, aluminum is considered a low priority pollutant at this time.
[2] Number of samples

[3] Theoretically chlorpyrifos and diazinon would qualify for listing under the State's listing policy, but the last exceedances were in 2004-05, and the products are no longer sold for urban use. Therefore, the Watershed Group considers these low priority pollutants.

[4] California Department of Fish and Wildlife, formerly California Department of Fish and Game

3.0 Water Quality Improvement Strategy

3.1 Overall Multi-Pronged Strategy

The Los Cerritos Channel Watershed Group (Watershed Group) has considered how best to develop a watershed management program to implement the requirements of Part VI.C.1.a of Order No. R4-2012-0175 and Part VI.C.1.a of Order no. R4-2014-0024 on a watershed scale through each Permittee's stormwater management program and through customized strategies, control measures, and best management practices (BMPs).

The Watershed Group has revisited strategies, control measures, and BMPs that it has discussed during the last five years and has concluded that addressing water quality impairments within the Los Cerritos Channel receiving waters should be based on a multi-faceted strategy initially focused on source control, runoff reduction, and total suspended solids (TSS) reduction. If pollutants are not generated or released, they will not be available for transport to the receiving waters. In addition, if soils can be stabilized, sediment controlled, and dry-weather runoff and initial flushes of stormwater runoff eliminated or greatly reduced, the major transportation mechanisms will be eliminated or greatly reduced, and many fewer pollutants will reach the receiving waters.

The Los Cerritos Channel Watershed Group plans to implement a water quality improvement hierarchy based on true source control, runoff reduction, and TSS reduction. Moving up the pyramid, treatment controls will constitute the smallest component of the overall program, as source control, reduction, LID and green streets, operational source control, capture and infiltration, and capture and use are all more effective methods for improving water quality.

3.2 Source Control Strategy

Members of the Watershed Group are interested in both "true source control" (pollution prevention) and "operational source control." The Watershed Group has been particularly focused on true source control because major sources of copper, lead, and zinc are released into the atmosphere, which results in widespread deposition on impervious surfaces such as streets, highways, parking lots, and rooftops. In addition, these metals are discharged directly onto streets, highways, parking lots, and driveways from motor vehicle components such as brakes, wheel weights, and tires.

Each of the cities within the watershed contributed either directly or indirectly to the effort by the California Stormwater Quality Association (CASQA) and Sustainable Conservation to develop

and negotiate the legislative proposal that ultimately became SB 346, which was adopted by the legislature in 2010 and signed by the Governor on September 25, 2010 as Chapter 307 of the Statutes of 2010. The passage of SB 346 is a milestone that will significantly reduce the level of copper in metropolitan area waters throughout the state since vehicle brake pads constitute the single largest source of copper in metropolitan environments (See Figure 3-2.) SB 346 requires incremental reduction in the amount of copper in vehicle brake pads with key milestone dates of January 1, 2021, when most brake pads sold in California will be required to contain less than 5% copper by weight and January 1, 2025, when most brake pads will be required to contain less than 0.5% copper by weight. (See Figure 3-3.) Indications from the major brake pad friction materials manufacturers are that they are planning, where feasible, to go straight to a "zero" copper pad where no copper is intentionally added to the pad. They will do this in order to reduce the multi-million dollar costs that would result from two friction materials reformulations within a few years.

Figure 3-1. Water Quality Improvement Hierarchy

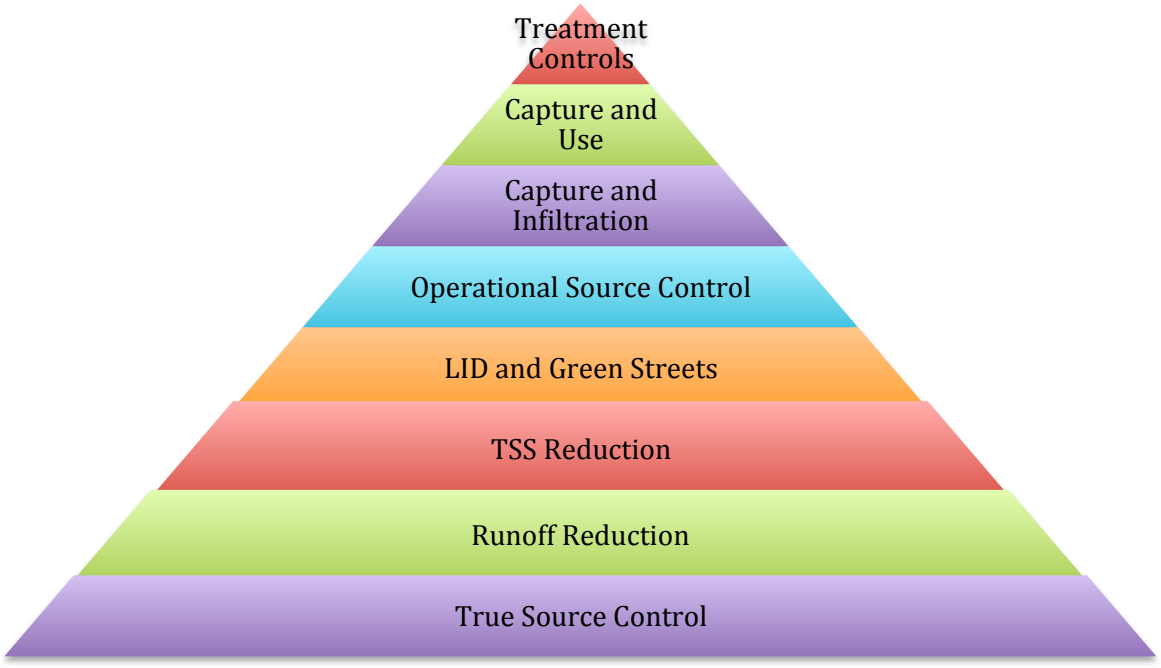
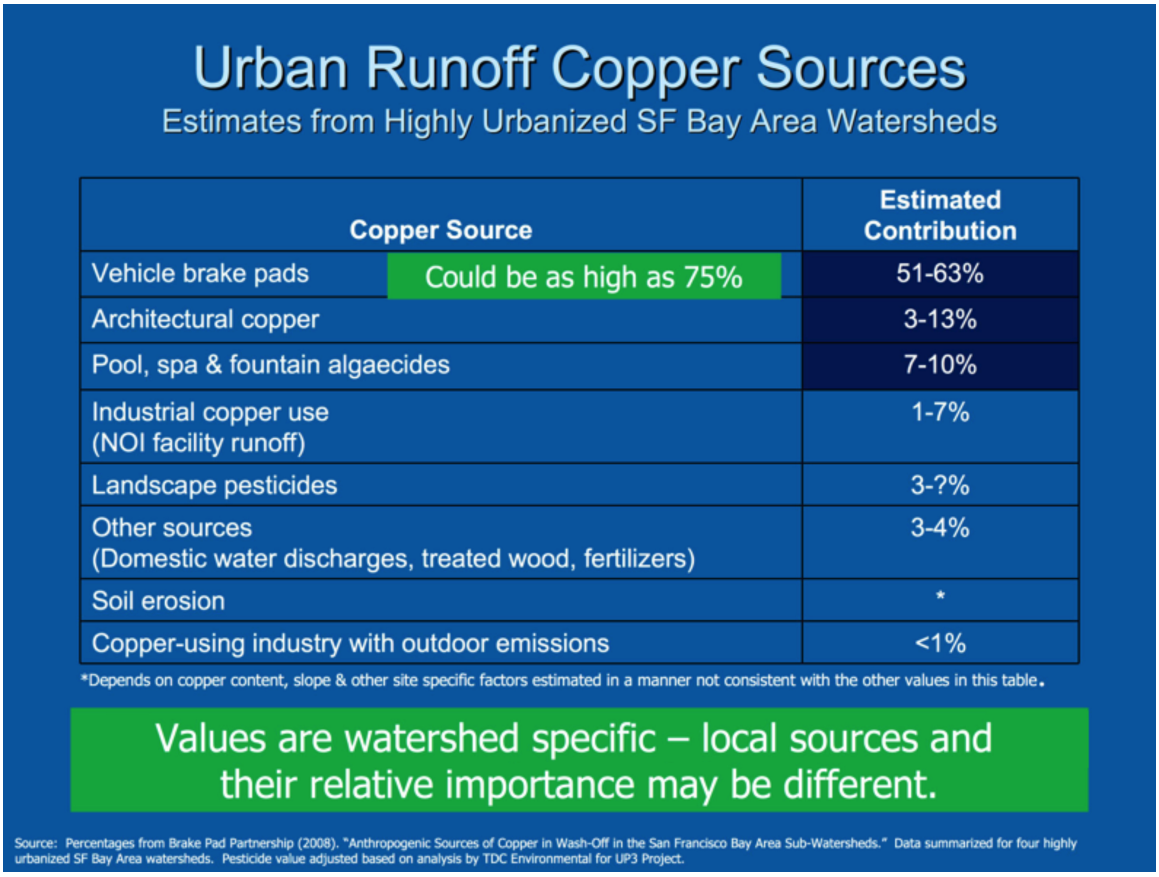
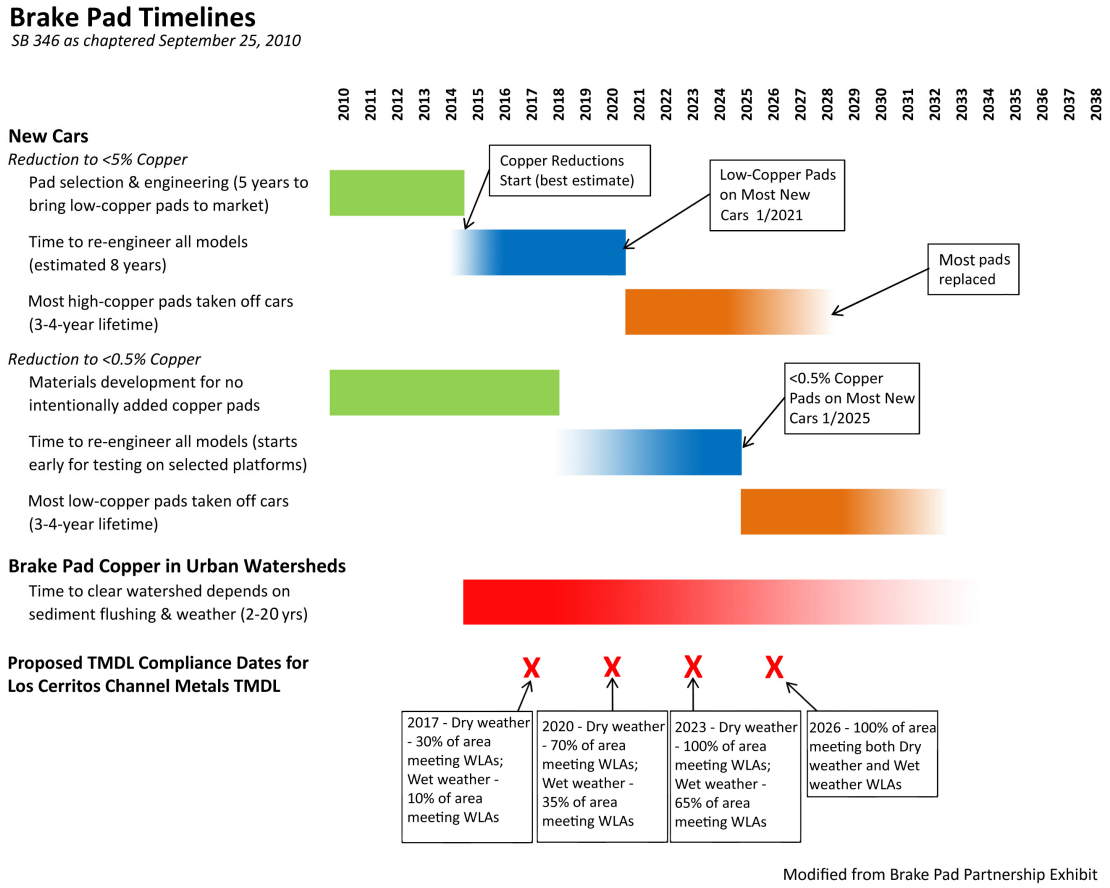


Figure 3-2



Source: Percentages from Brake Pad Partnership (2008). "Anthropogenic Sources of Copper in Wash-off in the San Francisco Bay Area Sub-Watersheds." Data summarized for four highly urbanized SF Bay Area Watersheds. Pesticide value adjusted based on analysis by TDC Environmental for UP3 Project.

Figure 3-3



Modified from Brake Pad Partnership Exhibit

To improve its understanding of the potential impacts of SB 346, the Watershed Group commissioned a study, "Estimate of Urban Runoff Copper Reduction in Los Angeles County from the Brake Pad Copper Reductions Mandated by SB 346." (See Attachment D.) This estimate relied on available information, which was largely developed through a lengthy collaboration among brake pad manufacturers, government agencies, and environmental groups in the Brake Pad Partnership. The estimate examined three scenarios: a one-step reduction in copper, a two-step reduction in copper, and an aftermarket exemption for 0.5% copper. Scenario one showed a 60% reduction in urban runoff copper reduction from brake pads alone by 2024 and a 61% reduction by 2028. Scenario two showed a 45% reduction by 2024 and a 60% reduction by 2028. Scenario three showed a 39% reduction by 2024 and a 49% reduction by 2028. A CASQA subcommittee is proposing to update these estimates in 2015 by incorporating new baseline copper concentrations data for new vehicles from Washington State, brake pad industry guidance on various assumptions used in the estimate, and the fraction of all brake pad formulations certified as containing less than 0.5% copper. All brake pads sold in California after January 1, 2014 are to be certified and marked with edge codes indicating this compliance level. As of November 7, 2014, 4,679 brake pads have been certified by NSF International, the

organization that certifies the measurement of copper in brake friction materials. The edge codes will provide information on copper content and the requirement that on and after January 1, 2014 any motor vehicle brake friction materials sold in California must contain no more than 0.1 percent by weight of the following materials: cadmium and its compounds, chromium (VI) salts, lead and its compounds, mercury and its compounds, and asbestiform fibers. There is a limited exception for depletion of inventories, but that exception ends December 31, 2023. The copper reduction study and an accompanying spreadsheet of calculations were reviewed with staff of the Los Angeles Regional Water Board in connection with the development and adoption of an Amendment to the Water Quality Control Plan for the Los Angeles Region to Incorporate Implementation Plans for the Total Maximum Daily Loads for Metals in the Los Cerritos Channel and for Metals and Selenium in the San Gabriel River and Impaired Tributaries.

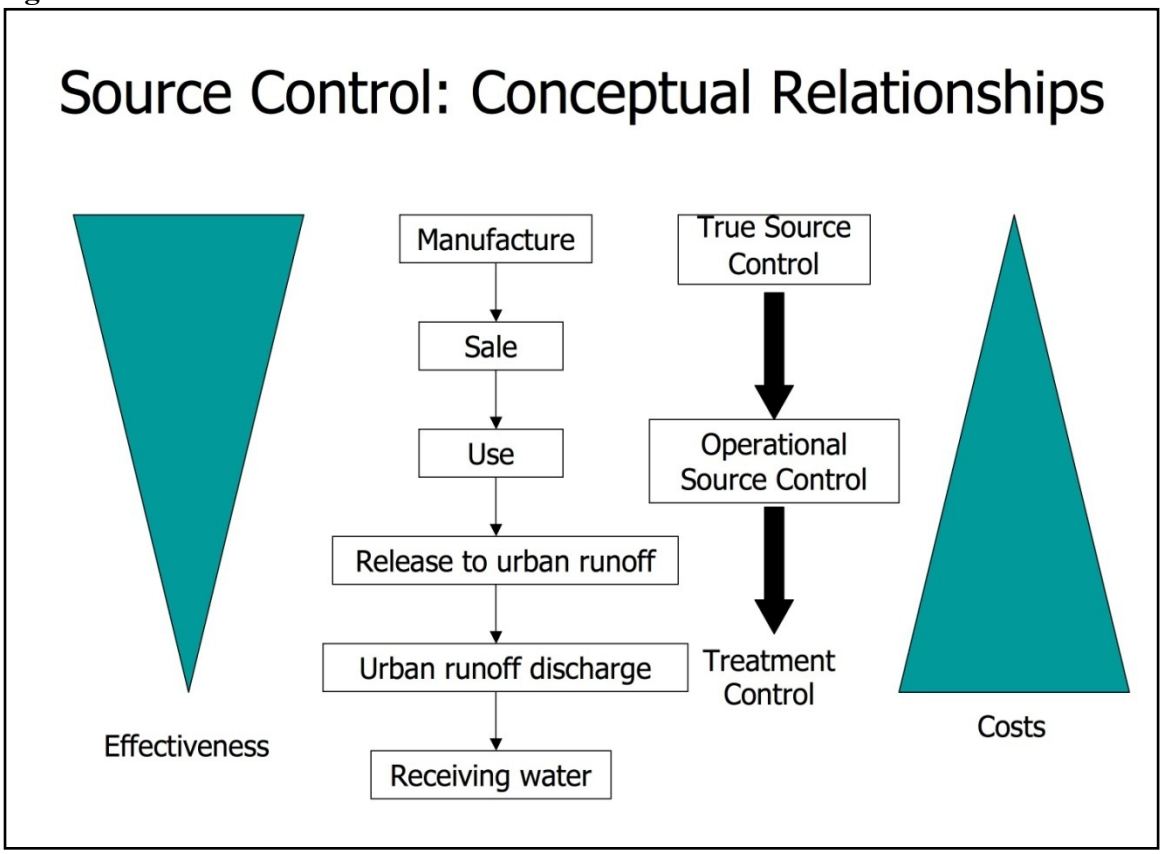
The results of the study are reflected in the Reasonable Assurance Analysis (RAA) performed to demonstrate that the activities and control measures identified in the Watershed Management Program will ensure that Permittee MS4 discharges will achieve applicable water quality-based effluent limitations for copper.

The Watershed Group has concluded that the most cost-effective and long-lasting way to solve water pollution problems is to develop state-wide or regional control measures that will encourage or require, if necessary, product substitution or material substitution at the manufacturing stage. This can be a complex and time-consuming process, but the payoff in water quality improvement can be tremendous.

The members of the Watershed Group are now looking forward to working with the California Stormwater Quality Association to address a major source of zinc – tires. The Department of Toxic Substances Control (DTSC) adopted new Safer Consumer Product Regulations that became effective October 1, 2013. These regulations contain a process for identifying and prioritizing Chemicals of Concern in Priority Products containing these constituents, as well as a process for eliminating or reducing the adverse impacts of Chemicals of Concern in Priority Products. It will apply to most consumer products placed into the stream of commerce in California. It specifically applies to adverse environmental impacts, including adverse water quality impacts, and it contains a petition process for identification and prioritization of chemicals and projects. CASQA, supported by Los Angeles River Watershed permittees, has started the process of conducting research and building a file of critical information to support the designation of zinc in tires as a future priority product/constituent combination. The initial product of this effort is a zinc literature survey that discusses major and minor sources of zinc as documented in scientific literature from around the world.

The cost and effectiveness relationships between true source control, operational source control, and treatment control are shown in Figure 3-4, prepared for CASQA.

Figure 3-4



Source: California Stormwater Quality Association (CASQA)

Because the requirements for inclusion on the initial priority product list are quite restrictive, the regulations cannot be used to control zinc in tires until after January 1, 2016. However, the Watershed Group and others will be able to utilize the next two years to work with CASQA and others to develop a well-supported petition to support the addition of zinc in tires as a product-chemical combination on the Priority Products List.

Operational source control involves such measures as street sweeping and working with public and private entities to reduce or eliminate the discharge of pollutants. The Permittees within the watershed will use their Public Outreach Programs and Public Agency Activities Programs to promote and monitor operational source control measures addressing priority pollutants within the Watershed.

The Industrial General Permit, readopted on April 1, 2014, will help control zinc associated with industrial processes. However, it does not regulate outdoor sources of zinc such as galvanized chain link fences and roofs that are common at industrial facilities, but not directly associated with industrial processes.

Permittees will also address outdoor sources of zinc and other metals partially through the following runoff reduction strategy. Capturing and infiltrating and/or using runoff will interrupt the transport of these metals to receiving waters.

3.3. Runoff Reduction Strategy

In conjunction with true source control (prevention of pollutants at the source) and operational source control, the Watershed Group will implement a runoff reduction strategy that initially will focus on reduction of dry-weather runoff that will result in substantial water quality improvements during dry-weather days (approximately 330 days per year on average). This will be accomplished through a combination of water conservation and improvements in landscape irrigation efficiency to eliminate or greatly reduce overspray and runoff that provides a transport mechanism to carry pollutants to the storm drain system and hence to the receiving waters of the Los Cerritos Channel. Strategic location of green street elements will also help reduce dry-weather runoff.

The Watershed Group will give both short-term and long-term emphasis to dry-weather runoff reduction in order to reduce or eliminate runoff as a mechanism to transport metals from industrial facilities, roads, parking lots, and driveways to the Los Cerritos Channel receiving waters. Water conservation measures will be emphasized in order to reduce the potential for dry-weather runoff. The Watershed Group has already realized reductions in runoff due to the application of water conservation measures. Water conservation and improved irrigation practices will be supplemented by: a) the diversion of dry-weather discharges to facilities designed to store and infiltrate water, and b) a reduction in directly connected imperious surfaces over time.

Reducing runoff during wet weather is a challenging and costly undertaking. The Watershed is essentially built-out and will be primarily dependent on redevelopment to create opportunities for wet-weather runoff reduction. However, the member agencies will endeavor to incorporate green infrastructure into redevelopment projects, implement green streets, retrofit LID components at key locations, capture and use or infiltrate stormwater, and reduce directly connected impervious areas to the extent reasonably feasible. Wet weather runoff reduction is a long-term measure that will be addressed in later phases of the implementation plan as grant funds become available. After source control and runoff reduction, members of the Watershed Group will look to sediment control, direct infiltration, capture and infiltration, capture and use, and treatment controls. (See Figure 3-1, the Water Quality Improvement Hierarchy that is central to the Water Quality Improvement Strategy of the Los Cerritos Channel Freshwater Watershed.)

Areas tributary to well-maintained BMPs designed to capture and infiltrate or capture and use the runoff from an 85th percentile, 24-hour storm should be deemed to be in compliance with

the assumptions and requirements of the WLAs for Watershed Management Programs as well as for Enhanced Watershed Programs.

The members of the Watershed Group propose to collaborate with water purveyors and their planning departments to use local water conservation requirements and implementation of AB 1881, the Water Conservation in Landscaping Act, to reduce both dry-weather and wet-weather runoff. AB 1881 was approved in the fall of 2006 with a requirement that the Department of Water Resources (DWR) update the model local water efficient landscape ordinance adopted by the Department in the early 1990s pursuant to Chapter 1145 of the Statutes of 1990. The updated model ordinance was promulgated by the Department on September 10, 2009. The Act required that not later than January 1, 2010, local agencies either adopt the updated model ordinance or another water efficient landscape ordinance at least as effective in conserving water as the updated model ordinance. By January 31, 2010, each local agency was required to notify the DWR whether it had adopted its own water efficient landscape ordinance or the updated model ordinance.

AB 1881 encourages the capture and retention of stormwater onsite to improve water use efficiency and water quality. It includes a requirement for a landscape water budget that establishes the maximum amount of water to be applied through an irrigation system. The model ordinance applies to new construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet, as well as developer-installed new construction and rehabilitated landscapes in single family and multi-family projects requiring a building or landscape permit, plan check, or design review. Since the watershed cities are largely built-out, the requirements will generally be limited to public projects and redevelopment projects, but every reduction in landscape irrigation should assist in reducing metal loads.

The majority of cities in the Watershed Group have already adopted water conservation ordinances that require the immediate conservation of water, usually as a progressive scale based on drought levels. These cities have also adopted landscape irrigation efficiency ordinances.

In addition, the Caltrans Stormwater Management Plan (SWMP) specifies requirements for the implementation of BMPs for State transportation projects (Caltrans 2003). Whenever a Caltrans project results in stormwater runoff to receiving waters or a storm drain system owned by another permittee, Caltrans is required to consider approved treatment systems (referred to as Category III BMPs) and, where feasible, to install them. Approved treatment systems vary, but Caltrans maximizes the use of biofilters or bioswales to reduce runoff and pollutant loads. Other approved treatment systems include infiltration basins, detention basins, traction sand traps, and dry weather flow diversions. Continued implementation of these requirements will provide

water quality benefits over the long term. It may be possible to further increase the use of structural BMPs to maximize infiltration onsite.

Reductions in dry-weather flows in recent years demonstrate that voluntary and mandatory reductions in irrigation have already had a significant impact. The average dry-weather runoff between 2001 and 2009, as measured at Stearns Street, was 2.35 cfs. It is now less than 0.5 cfs. This means that there has been a 78% reduction from the average flows between 2001 and 2009. The RAA modeled an average 2003 dry-weather flow of 4.65 cfs and an average 2008 dry-weather flow of 2.20 cfs, and the existing measured dry-weather flow is 89% lower than the modeled 2003 dry-weather flows and 77% lower than the modeled 2008 dry-weather flows. This indicates that current dry-weather pollutant loads are significantly less than the modeled 2003 and 2008 daily pollutant loads. Continued restrictions on irrigation, replacement of turf, and installation of more efficient irrigation equipment in response to runoff restrictions will result in further reductions in irrigation and runoff.

3.4 Total Suspended Solids Reduction Strategy

After reviewing the "Wet-Weather Modeling Analysis" subsection of the Linkage Analysis in the Los Cerritos Channel Total Maximum Daily Loads for Metals, the Watershed Group concluded that beyond the Minimum Control Measures, runoff reduction, and implementation of SB 346, initial implementation of its multi-pronged strategy should focus on TSS reduction. This conclusion is based on statements in the TMDLs document. The wet-weather Modeling Analysis discussion in the TMDLs stated that "To assess the link between the sources of sediment, metals, and the impaired waters, a modeling system was utilized that simulates land-use based sources of sediment and associated metals loads and the hydrologic and hydraulic processes that affect delivery." It went on to say that "Loading processes for metals (copper, lead, and zinc) for each land use were represented through their association with sediment." These statements about the modeling process describe the bases for the metals TMDLs and indicate that initial WMP measures implemented in the watershed should focus on TSS reductions. Reducing TSS in the receiving waters should result in a significant reduction of metals and legacy organics in the receiving waters since both groups of pollutants adhere to sediment. The greater the reduction in TSS, the greater the reduction in metals and legacy organics. Initial emphasis on TSS reduction should reduce the volume of water that ultimately needs to be captured and infiltrated or used to achieve standards for the Category 1 pollutants being addressed by the WMP – namely metals and legacy organics. This would make implementation of the WMP more cost-efficient.

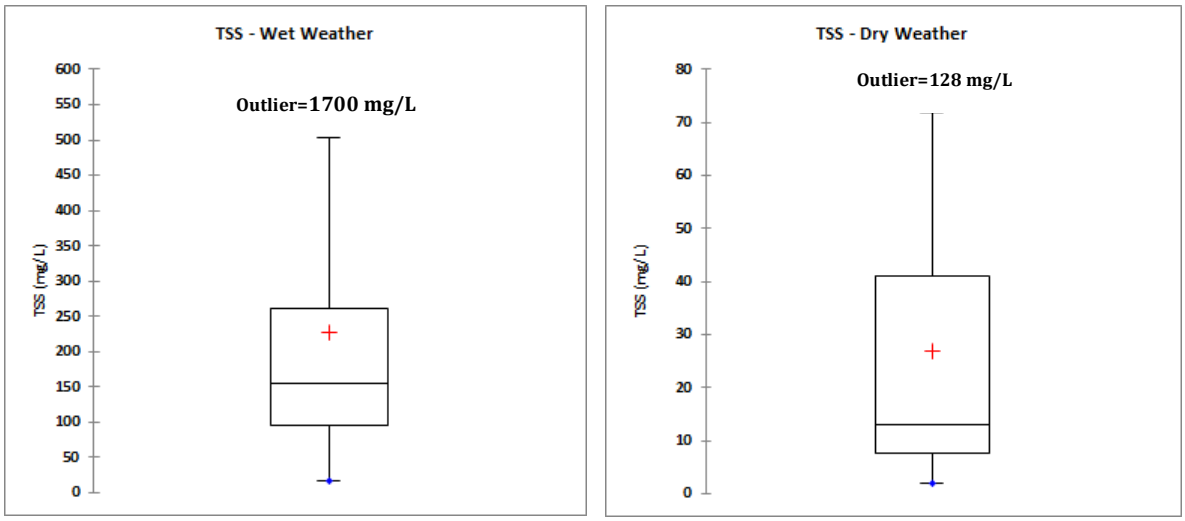
Table 3-1 below, and the accompanying box plots on the following page, provide a summary of TSS concentrations at the Stearns Street monitoring site over a 13-year period, based on 74 wet-weather observations and 25 dry-weather observations.

Table 3-1. Summary statistics of TSS (mg/L) measured at the Los Cerritos Channel Stearns Street mass emission and TMDL monitoring site.

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

Although the Reasonable Assurance Analysis is assuming only a 5% reduction in TSS through implementation of the TSS Reduction Strategy, the Watershed Group is actually targeting a reduction in the wet-weather mean concentration of TSS at Stearns Street from 227 mg/l to 150 mg/l. This target seems reasonable in light of TSS concentrations in other developed watersheds. It would be a 34% reduction in the mean concentration of TSS. Since the wet-weather mean sediment load is greatly influenced by the larger loads associated with large storms, to significantly reduce the TSS load in the channel, the Watershed Group will need to adequately address sediment concentrations resulting from larger storms. Implementation of this strategy will be assessed through the adaptive management process.

Table 3-2. Box Plots of Wet and Dry Weather TSS Concentrations at the Los Cerritos Channel Stearns Street Mass Emissions and TMDL Monitoring Site



Dark center line is the median (50th percentile), the red plus sign is the arithmetic average, the upper end of the box is the third quartile or Q3 (75th percentile), the lower end of the box is the first quartile or Q2 (25th percentile), the upper whisker is (Q3 + 1.5*(Q3-Q1)), the lower whisker is (Q1-1.5* (Q3-Q1).

The TSS Load Reduction Strategy is targeted at accelerating reductions of Category 1 pollutants addressed by the Los Cerritos Channel Metals TMDLs and the Greater Harbor Toxics TMDLs. It will also help to address bacteria loading within the watershed. The final compliance date for the Los Cerritos Channel TMDLs is September 30, 2026, and the final compliance date for the Greater Harbor Toxics TMDLs is March 23, 2032. The Watershed Group believes that TSS reduction, combined with true source control (discussed in Section 3.2), low impact development, green streets, and implementation of minimum control measures will constitute a strong and effective initial implementation of the WMP. The combination of these measures will facilitate compliance with interim milestones while providing time for funding measures to be put in place to pay for the design, construction, and operation of stormwater capture and low flow diversion facilities and to develop working relationships with water and wastewater agencies.

The core of this program is the Group's soil stabilization/sediment control strategy, described in Section 3.5 of the WMP. Two key components of this strategy are implementation of enhanced erosion and sediment control at construction sites, in accordance with each city's Development Construction Program (see Section 4.3.2), and stabilization of exposed soil not associated with construction sites. As noted above, the Group recognizes that the total sediment load in the Channel is closely associated with infrequent larger storms. For this reason, the Group's soil stabilization/sediment control program will emphasize soil stabilization and, for the larger sources of exposed sediment in each jurisdiction, supplemental sediment control measures. The

Group intends to reduce the sediment load from the watershed, as measured at the Stearns Street monitoring station, by at least 20% by 2020. The Watershed Group considers this is a reasonable target given the magnitude of exposed dirt in the watershed. Such a reduction would result in significant reductions in the loads of metals, legacy organics, and bacteria.

In preparation for addressing exposed soil not associated with construction sites, various member cities have conducted initial assessments of exposed soil within these jurisdictions. The assessments indicated that the City of Signal Hill has the highest percentage of exposed dirt in the Watershed due to a number of factors, including slopes and the impacts of current and historic oil production. Therefore, the initial focus for TSS reduction will be on sub-basin 4 (See Figure 1-4 and Attachment B), which includes portions of Signal Hill and Long Beach. An initial analysis of exposed dirt not associated with construction in the portion of Signal Hill in the Los Cerritos Channel Watershed indicates that it totals approximately 3.06 million square feet (70.3 acres), or 13.2% of the city area within the Watershed. This is a much higher proportion of exposed dirt than in any other city in the Watershed. In addition, Signal Hill has greater local relief than the other cities within the Watershed and hence a higher probability of significant erosion and discharge of sediment than other portions of the Watershed. Furthermore, sub-basin 4 was modeled as being the number one source of zinc in the Watershed during development of the Metals TMDLs by USEPA.

The City of Signal Hill has agreed to develop a model vacant lot ordinance designed to reduce the discharge of sediment from the City. Development of the ordinance will consider elements of a vacant lot landscaping ordinance adopted by the City of Whittier and Signal Hill's own ordinances dealing with Storage Yards and Outdoor Storage Areas and with Trucking Yard Performance Standards. The Whittier Ordinance defines different types of vacant lots and specifies landscaping, irrigation, and maintenance requirements for lots. Lots smaller than one-half acre must be fully landscaped with draught tolerant or xeroscape material that requires no or little water after the first three years of growth. For lots one-half acre or larger, a minimum five-foot wide landscaped planter is required adjacent to public rights-of-way, except alleys, using the same landscaping materials used in the smaller lots. Perimeter barrier fences are also required behind the planters. The model ordinance will specifically focus on erosion and sediment control. It will also likely utilize the compliance plan approach used in the Signal Hill ordinances as a tool to build consensus on how best to reduce erosion and the discharge of sediment. The Signal Hill ordinances include a procedure for City review of properties for compliance with provisions of the ordinances. The City then prepares compliance plans for non-compliant properties and allows property owners to prepare alternative compliance plans for City approval.

The initial assessments conducted have indicated that two of the other potential major sources of exposed soil within portions of the watershed are beyond the direct control of the cities. These are Caltrans rights-of-way and transmission line rights-of-way. Caltrans rights-of-way are

found in Sub-basins 1, 2, 4, 8, 9, and 10. Transmission line rights-of-way are found in sub-basins 1, 2, 8, 9, and 10. Since Caltrans is a participant in the Watershed Group, the cities will work with Caltrans to ensure that its rights-of-way are stabilized in a timely manner. However, since the public and private utilities whose rights-of-way must be stabilized are not members of the Watershed Group, negotiations with the utilities on how best to keep sediment from their rights-of-way out of the storm drain system will be necessary. This process has already begun with meetings held with representatives of Southern California Edison.

3.4.1 Soil Stabilization/Sediment Control

The Watershed Group plans a major, multi-faceted program to control sediment to implement its TSS Reduction Strategy and because metals (Category 1 Priority Pollutants) are ubiquitous within the area due to atmospheric deposition. These metals adhere to sediment and are transported to receiving waters by rainfall and urban runoff. The approaches to sediment control proposed for use in the watershed include enhanced erosion and sediment control at construction sites, stabilization of exposed soil not associated with construction sites, enhanced street sweeping, and enhanced parking lot sweeping.

Since the area is built out, there is limited construction at any given time. However, enhanced erosion and sediment control at all construction sites involving disturbed soil of one-acre or more is mandated by the current State Construction General Permit that became effective on July 1, 2010. In addition, the Permittees will require an effective combination of erosion and sediment controls for construction sites of less than one acre, consistent with Part IV.D.8.d of Order No. R4-2012-0175. They also will employ erosion and sediment control on publicly owned areas with exposed soil, and will encourage and/or require private property owners to stabilize exposed soil on vacant lots and other privately owned sites. These practices will first be employed in the Phase I sub-watersheds (See Section 6).

Cities throughout the Watershed will consider the adoption of vacant lot ordinances that will contain landscaping as well as erosion control and sediment control, based on experience with a pilot ordinance proposed for adoption by the City of Signal Hill, to help with initial implementation of the TSS Reduction Strategy.

Caltrans will stabilize exposed soil within its rights-of-way in order to reduce the transport of metals in runoff from its facilities and to sequester legacy lead that can be transported by wind as well as water.

3.4.2 Enhanced Street Sweeping

Enhanced street sweeping will be especially important until the sources of metals in atmospheric deposition are controlled. Metals are deposited on streets, highways, and parking lots directly from cars and trucks and also across the Watershed by atmospheric deposition.

Much of the critical sediment for transporting metals to receiving waters is very fine and not picked up by traditional broom sweepers.

Street sweeping is getting renewed attention as an operational best management practice to reduce the discharge of sediment and metals. New vacuum sweepers and regenerative sweepers are quite effective at removing fine particles from streets and parking lots. The U.S. Navy is one of the agencies examining the use of high-efficiency sweepers to remove metals from its facilities. In May 2008, the Navy's Space and Naval Warfare Systems Command (SPAWAR) Systems Center in San Diego made a presentation entitled, "Metals Load Reduction in Storm Water Using High-Efficiency Sweepers" to a Joint Services Environmental Management Conference. The Navy observed that there are numerous widespread sources of metals, some of which are not easily controlled. The Navy is responsible for large areas with many discharge points. The Navy was concerned that stormwater metals concentrations, particularly copper and zinc, commonly exceed storm or process water discharge compliance requirements, since metals accumulate in sediments and receiving water impacts occur at low concentrations.

The Navy focused on street sweeping as a potentially effective BMP for reducing the adverse impact of metals on receiving waters because: 1) it can be applied to large areas, 2) particles on the ground are a source of stormwater copper and zinc, and 3) new sweeper technologies may be capable of removing significant amounts of particles, and, therefore, metals. The Navy's early tests showed that some particles swept off the ground were relatively high in copper and zinc and that these particles were a source of dissolved metals. The SPAWAR Systems Center concluded that high efficiency sweepers could remove significant amounts of metals before they become entrained in stormwater and that sweeping provides a potentially useful wide-area BMP.

The use of high-efficiency sweepers as an area-wide BMP for metals appears to be particularly applicable for the Los Cerritos Channel drainage area because indirect atmospheric deposition and direct deposition from motor vehicles are primary sources of metals in the Watershed.

As a result of the Navy's research and other recent research into the effectiveness of high-efficiency vacuum and regenerative sweepers, the Watershed Group has concluded that the timely use of well-maintained, high-efficiency sweepers could constitute a deemed compliant BMP for metals in the same way that the use of certified full-capture devices does for trash. Therefore, the Watershed Group proposes to implement an enhanced street and parking lot sweeping program within the upper portion of the Palo Verde Channel sub-basin and the upper portion of the Clark Channel sub-basin during the first phase of implementation of this plan.

In addition, Caltrans conducts roadway and roadside cleanup operations to provide safe highway conditions and to maintain a neat and clean appearance. Sweeping operations are scheduled at the discretion of the Maintenance Supervisor based on the accumulation of trash and debris. Depending on traffic, weather, and available resources, sweeping frequencies are based on collecting a minimum of 1/2 cubic yard and a maximum of 1 cubic yard of material per mile swept. Debris on the roadway that may constitute a traffic hazard is removed immediately upon discovery or notification. Caltrans uses mechanical broom sweepers that meet the specifications needed to sweep in the highly traveled freeway environment and to pick up the variety of materials found on a the freeway shoulder or median. Caltrans, in cooperation with the other Watershed Group members, will reevaluate its sweeping policy with the goal of improving the efficiency of metals removal.

3.5 Runoff Capture and Infiltrate or Use Strategy

The Los Cerritos Channel Watershed Group chose not to pursue an Enhanced Watershed Management Program, largely because of its knowledge of the depth to the drinking water aquifer and the widespread presence of clay lenses throughout the watershed. The combination of these factors will make implementation of a capture and infiltrate strategy challenging. Therefore, the Group has attempted to locate potential water capture facilities in locations where the captured stormwater can be treated, if necessary, and used for irrigation if infiltration is not feasible. These locations include local parks and golf courses where irrigation is needed (See Section 4.5.2 and Figure 4-1). The Group is also looking at utility right-of-way sites where captured water could be used for nursery or garden plot irrigation, as well as at school sites (See Section 4.5.2 and Figure 4-2). To date, thirteen water capture sites have been identified, primarily in upper and middle portions of the watershed (See Section 4.5 for the location of these sites). Implementation of projects at these sites will be phased in over time, as needed and as funding is available. The initial stormwater capture projects are planned for locations in Mayfair Park in the City of Lakewood, Caruthers Park in the City of Bellflower, and Skylinks Golf Course in the City of Long Beach. Projects at these sites will capture non-stormwater runoff and first flush stormwater discharges from the upper portions of sub-basins 4, 8, and 10, as defined in the Los Cerritos Channel TMDL for Metals in the Cities of Bellflower, Lakewood, Long Beach, and Signal Hill. The Mayfair Park project will also capture discharges from the middle portion of sub-basin 8 in the City of Lakewood. These locations will be particularly helpful in bringing the upper portions of these sub-basins into compliance with waste load allocations in the Metals TMDLs and reduce the loads of other priority pollutants with similar fate and transport characteristics. The next three sites will be in Heartwell Park and Skylinks Golf Course in the City of Long Beach. These sites will serve sub-basins 6, 7, and 10. In addition to the use of major stormwater capture facilities, the Permittees will accomplish additional stormwater capture and infiltration through implementation of LID ordinances and Green Streets policies. Implementation of projects through the use of these ordinances and policies will be scattered across the built-out watershed because they will be dependent on the initiation and completion

of redevelopment projects and road reconstruction projects. However, over a sustained period of time, they should contribute significantly to non-stormwater and stormwater infiltration and interruption of the runoff transport mechanisms.

3.6 Treatment Control Strategy

Except for vegetative treatment associated with LID, MS4 treatment control is generally viewed by the Watershed Group as a last resort to be used when true source control and operational source control, runoff reduction, and sediment control are not sufficient to comply with water quality-based effluent limits based on the assumptions and requirements of TMDLs applicable to the Watershed, or other applicable water quality objectives. This view is based on the conceptual relationships shown in Figure 3-4 in Section 3.2. Treatment control before discharge into receiving waters tends to be less effective and more costly than source control, especially true source control, which was why CASQA and Sustainable Conservation spent so much time and money getting SB 346 adopted and signed into law. Removing the very small particles of copper emitted by brake pads from stormwater discharges would have been very difficult, inconsistent, and extremely expensive. Similar relationships are associated with the treatment of other pollutants such as zinc, pesticides, and bacteria. In addition to the current measures to reduce copper in brake pads, the Watershed Group is acutely aware that the removal of lead from leaded gasoline and the banning of the sale of diazinon and chlorpyrifos in urban California have already had positive effects on water quality and reduced the costs of future treatment control. The Permittees are also keenly aware that some treatment control is likely to be necessary to achieve compliance in a timely manner.

The Cities will be complying with the proposed trash amendments to the Water Quality Control Plan for Inland Surface Water, Enclosed Bays, and Estuaries in California when the amendments are adopted by the State Water Resources Control Board and become effective. The strategy for compliance with the amendments will have to be developed after the draft Watershed Management Program has been submitted to the Regional Water Board because the proposed amendments have just been released for public comment and will not be adopted until later in 2015. The proposed amendments contain compliance options similar to those in the Los Angeles River Trash TMDL, but with the opportunity to focus on high trash generation areas.

The Permittees anticipate that much of the treatment control implemented in the Watershed will be associated with implementation of LID ordinances and Green Streets policies. They also anticipate that some treatment control may be necessary to achieve zinc waste load allocations. Although enhanced street sweeping should be sufficient to control direct and indirect deposition of zinc on arterials and residential streets, control of zinc from industrial sources may require the installation of targeted treatment controls since the capture and infiltration or capture and use of both non-stormwater and stormwater discharges will be a long-term and expensive process. In addition, Permittees are not certain how effective implementation of the

new Industrial General Permit will be with respect to the reduction of zinc in stormwater discharges. This uncertainty is magnified by the recognition that many zinc sources at industrial facilities are not related to industrial processes and therefore not regulated by the Industrial General Permit.

The need for installation of treatment control facilities will be continually re-evaluated through the adaptive management process required by Order Nos. R4-2012-0175 and R4-2014-0024 and explained in Section 10 of this plan. The Permittees are confident that a continuation of the implementation of SB 346, enhanced street sweeping, dry-weather runoff reduction, and TSS reduction will be sufficient to meet the September 30, 2017 and the September 30, 2020 milestones in the Los Cerritos Channel Total Maximum Daily Loads for Metals. However, compliance with the September 23, 2023 interim milestone and the September 30, 2026 final compliance date may require treatment controls if there is any delay in implementation of SB 346, or if stormwater Permittees are not successful in using the petition process in the Safer Consumer Products Regulations to control zinc in tires. In addition, if new regulations promulgated by the Department of Pesticides Regulation are not successful in reducing pyrethroids in stormwater discharges, effective treatment control measures may have to be developed and implemented.

3.7 Financial Strategy

This financial strategy is provided to meet the development and implementation requirements for this WMP in accordance with Order No. R4-2012-0175 and Order No. R4-2014-0024. The cost estimates provided herein are preliminary and based on the best science available to date. The estimates are also subject to revision as new information becomes available, including as the projects are refined over the implementation period.

Financing the implementation of the Water Quality Improvement Strategy for the Los Cerritos Channel Watershed is the greatest challenge confronting the agencies in the Watershed. In the absence of stormwater utility fees, the agencies have no dedicated revenue streams to pay for the stormwater capture BMPs anticipated if the agencies in the Watershed were to depend on stormwater capture and treatment controls to achieve compliance. Therefore, to be able to sufficiently reduce pollutant loads to meet water quality objectives, the Watershed is going to pursue a multi-pronged financial strategy to match the multi-pronged Water Quality Improvement Strategy. In addition, the Watershed is coordinating the proposed implementation schedule (see Section 6) with the financial strategy.

The Watershed Group has considered the recommendations in the City Managers' Stormwater Funding Options report in developing this financial strategy. The City Managers' report addresses options open to the agencies in Los Angeles County after the County Board of Supervisors chose not to move forward on a proposed stormwater fee that would have generated approximately $295 million annually. A critical component of the report is the

observation that moving forward with a stormwater fee vote would likely occur after June 2015, which means that the first funds might not be available until property tax payments are received in 2017. Therefore, the Watershed Group will strongly emphasize minimum control measures, source control, runoff reduction, and TSS reduction through the end of the current permit cycle. If a fee structure similar to the proposal presented to the Board of Supervisors in 2013 were adopted, the Los Cerritos Channel Watershed could expect annual revenues of approximately $2.7 million from a pro-rata distribution of the funds allocated to the Cities in the Watershed starting in 2017, plus a possible $3.4 million for the portion of the fee allocated to the Watershed Authority Groups (WAGs) if the Cities and the applicable WAGs allocated money to the watersheds on a proportional basis.

Assuming a total of approximately $6 million per year available from a funding source based on the proposed Clean Water, Clean Beaches funding initiative, the Watershed could expect approximately $60 million to be available over 10 years and $150 million over 25 years. However, these amounts would not be sufficient to pay for expensive stormwater capture and dry-weather low flow diversions to the sanitary sewer if the agencies had to depend on such projects to come into compliance with receiving water limitations and water quality-based effluent limitations specified in Order No. R4-2012-0175. Estimates provided by Tetra Tech and Paradigm Environmental in the Reasonable Assurance Analysis for this WMP indicate that the volume of water capture capacity within the Watershed could be 209 acre-feet (AF) in 2020 and 592 acre-feet in 2026. According to the RAA, the 209 AF capture value is equivalent to achieving a 35% load reduction by September 20, 2020. The 592 AF in water capture volume was modeled as capture/treatment volume required to achieve the final load reduction requirements of the Metals TMDLs in 2026. These estimates assume total dependence on water capture and that implementation of other measures does not significantly reduce pollutant discharges to the receiving waters.

For cost estimation purposes, this WMP initially assumes that the Watershed could ultimately require the capacity to capture and infiltrate or use 592 AF of water. This estimate is based on the Reasonable Assurance Analysis performed to demonstrate that the activities and control measures proposed in this WMP will achieve compliance with applicable compliance deadlines during the permit term. Based on cost estimates for constructing underground compact concrete stormwater capture facilities with a capacity of eight acre-feet, such a requirement could cost $332 million for construction of these facilities between now and September 30, 2026. This represents an average cost of $18,745 per acre, which is approximately $989 more than the estimated compliance cost of $17,756 per acre for the City of San Diego (under a different permit with fewer TMDLs) and $9,212 less than the estimated costs of $27,957 per acre for the City of Los Angeles (under the same permit). This estimate is a planning level cost estimate. No preliminary engineering has been completed. Costs could be reduced significantly by implementation of effective source control measures, TSS reduction measures, the implementation of green streets, and the implementation of low impact development.

Implementation of these alternative control measures will be continuously monitored, and future costs will be re-estimated during each adaptive management review.

As the City Manager Work Group notes in its Stormwater Funding Options report, "the Los Angeles region faces critical, very costly, and seriously underfunded stormwater and urban runoff water quality challenges." The latest MS4 permits, Order No. R4-2012-0175 and Order No. R4-2014-0024, have greatly magnified the cost challenges. The absence of a stable stormwater funding mechanism not tied to municipal General Funds is becoming even more critical. For that reason, the City Manager Committees of the California Contract Cities Association and the League of California Cities, Los Angeles County Division, formed a Work Group to review stormwater funding options after the County's proposed Clean Water, Clean Beaches funding initiative failed to move forward. The Work Group found that funding stormwater programs is so complex and dynamic, and the water quality improvement measures so costly, that Permittees cannot depend on a single funding option at this time. The City Managers' report includes a variety of recommendations, including: organizational recommendations; education and outreach program recommendations; recommendations for legislation; Clean Water, Clean Beaches recommendations; local funding options; and recommendations for the Regional Water Board.

Watershed Group members have been involved in development of the recommendations, and the Group proposes to consider the recommendations of the City Managers Work Group and to work with its recommendations to do what is necessary to develop long-term solutions to stormwater quality funding. In the meantime, the Watershed Group will focus on the local funding options presented in the report to secure the needed funding for initial implementation of the WMP.

During the early years of implementation, the Permittees anticipate having to depend largely on local fees such as commercial/industrial inspection fees, General Fund expenditures, and, potentially, Clean Water State Revolving Fund program financing agreements to fund implementation of the Water Quality Improvement Strategy. The Watershed Group will seek opportunities to leverage the limited funds available. It will do this by financially supporting efforts of others, such as the California Stormwater Quality Association (CASQA), to seek State approval of true source control measures such as implementation of the Safer Consumer Product Regulations adopted by the Department of Toxic Substances Control in 2013. The Watershed Group will also support programs to increase water conservation, reduce dry-weather discharges to the storm drain system, and reduce TSS during wet weather. Successfully accomplishing these efforts could reduce the money needed in the long term to capture and/or treat stormwater discharges to comply with TMDLs and meet water quality objectives.

In addition, although Caltrans District 7 has only been participating informally in the Watershed Group, the Group's consultants have been in communication with Caltrans Headquarters regarding implementation of Attachment IV of the Caltrans Permit and the future possibility of

working together on one or more projects through a Cooperative Implementation Agreement. There have also been discussions concerning the possible future Cooperative Implementation Grant Program that could be administered by the State Water Board. The Group will continue to closely coordinate with appropriate Caltrans District and Headquarters staff regarding the identification and implementation of watershed control measures to achieve water quality requirements as well as funding opportunities.

Concurrently, the Watershed Group proposes to work with the California Contract Cities, the Los Angeles County Division of the League of California Cities, and others to educate elected officials and voters about the water quality problems facing the region and the need to develop an equitable financing mechanism to fund the programs and facilities necessary to come into compliance with water quality regulations.

Legislative solutions will be necessary to clarify the application of Proposition 218 to fees for stormwater projects. AB 2403 has provided some assistance. It changed the definition of water in the Proposition 218 Omnibus Implementation Act of 1997 to make it possible to levee a fee to fund the capture and infiltration or capture and use of stormwater without the need for a vote of property owners as the general electorate. The Watershed Group will also support local and statewide efforts to amend Proposition 218 to have all stormwater fees treated in the same manner as water, sewage, and refuse fees. The Watershed Group, and/or its member agencies, will also seek grants to implement rainwater capture and reuse or capture and infiltrate projects on publicly owned property, including grants resulting from the passage of Proposition 1 on November 4, 2014. The Water Bond designated $200 million specifically for multi-benefit stormwater management projects, and funds for several other provisions could provide additional funds for stormwater quality projects.

In the long term, financing the Water Quality Improvement Strategy for the Los Cerritos Channel Watershed will require establishing dependable revenue streams for local water quality programs. Accomplishing this formidable task will require the cooperation of many entities, including business and environmental organizations and the Regional Water Board.

3.8 Uncertainties

There are many uncertainties associated with the implementation of this Watershed Management Program that could impact future program costs, availability of funding, and future risks. These uncertainties will be at least partially addressed through experience and implementation of the adaptive process discussed in Section 10. However, they will continue to exist throughout the life of the Program. The Watershed's communities have already made significant investments in stormwater quality programs. For example, the City of Signal Hill has seen its stormwater compliance budget grow by 260% during the last decade (from $250,000 in 2004 to $650,000 in 2014). By contrast, the City's general fund budget grew by 20% during this same time frame, with general inflation increasing by 31% during this ten-year period.

Permittees fear greatly increased costs in the future because of new permit requirements, and they are concerned that they do not know exactly what the costs will be or where they will get the money.

The majority of the Watershed's communities have relied on general fund revenues to finance their stormwater programs. These monies face competition from other critical municipal services, including public safety (police, sheriff, fire, paramedics), parks, and street maintenance programs. This is primarily due to the uncertainties created by Proposition 218. The State's Constitution was amended in 1996 to require votes by either property owners or the general electorate on many parcel based taxes and fees. The *Jarvis v. City of Salinas* case, heard in 1999 in the 6th Appellate Court, resulted in the ruling that stormwater fees must follow the election requirements found in Proposition 218. This has made the adoption of stormwater fees very difficult statewide. However, despite the challenges of implementing stormwater fees caused by Proposition 218, some Cities have been able to fund portions of their stormwater programs with new fees. For instance, in 2004, the City of Signal Hill relied upon the Proposition 218 protest hearing process to increase revenues for trash reduction programs in stormwater. This fee annually collects approximately $96,000, which is used to fund trash related implementation costs for the Signal Hill stormwater quality program. AB 2403 made adoption of some stormwater fees easier, but only for fees funding stormwater use projects.

Uncertainties Associated with Long-Term Costs

This Program places great emphasis on source control (pollution prevention), runoff reduction, and erosion and sediment control as cost-efficient means of reducing pollutant loads to come into compliance with TMDLs and other water quality standards. There is a substantial degree of uncertainty associated with these control measures because they are partially dependent on the adoption and implementation of State legislation and local ordinances. Adoption and implementation of these measures, in turn, are dependent upon understanding complex storm water quality issues and upon commitment to implementing measures and enforcing legislation and ordinances. There are also many uncertainties associated with the implementation of structural control measures such as green streets, low impact development, stormwater capture facilities, and treatment control facilities. The success and efficiencies of these projects will be impacted by factors such as the infiltration rates of soils, the presence of clay lenses, the existence of high water tables, and the presence of existing underground utilities. There could also be changes in water quality standards and other regulations that would impact long-term costs.

Uncertainties Associated with Available Funding

As noted in the draft *Stormwater Funding Options* report discussed above in Section 3.7, there are many uncertainties associated with future funding for stormwater quality programs in Los Angeles County and elsewhere in California, since they are functionally orphaned utilities.

Stormwater programs were not treated like water, sewer, and refuse utilities in Proposition 218 and therefore face much steeper hurdles in developing stable, sustainable revenue streams. The decision in the recent *Griffith v. Pajaro Valley Water Management Agency* case (as codified in AB 2403) provides some relief for projects directly associated with water supply and use, but the decision does nothing to assist funding of the majority of stormwater quality programs and projects. An amendment to Article XIIID of the California Constitution would be needed to fully treat funding of stormwater quality programs on par with water, sewer, and refuse utilities.

The decision by the Los Angeles Board of Supervisors in 2013 not to move forward with the proposed stormwater fee created more uncertainty for stormwater quality programs in Los Angeles County. Two of the reasons that the Board of Supervisors decided not to move forward with the proposed fee were that cities did not strongly support the fee and several groups, such as school districts, the business community, and others - including some cities - had concerns with the structure of the fee and the timing of the process. As noted above, the City Managers Committees of the California Contract Cities Association and the League of California Cities, Los Angeles County Division, responded to the decision by the Board of Supervisors by convening a meeting of stakeholders. The City Managers' group undertook development of the *Stormwater Funding Options* Report in light of the extraordinary costs expected to result from implementing the Watershed Management Programs and Enhanced Watershed Management Programs specified in the new Los Angeles Area Municipal Stormwater Permit. The *Stormwater Funding Options* Report presents a range of recommendations, but the outcome of these recommendations is not known at this time, adding to the uncertainties associated with future funding availability.

Another potential source of funding is grant funding. Over the last few years stormwater programs have received some project funds from grants funded by Proposition 40, 50, and 84. However, most of these grant funds have been spent or committed. The passage of Proposition 1 authorizes another $7.12 billion in general obligation funds for water quality supply, treatment, and storage projects. However, the total amount that will be available for stormwater projects is not known at this time. Neither is the rate at which funds will be made available known at this time. However, we do know that the Governor's proposed 2015-2016 State Budget only directly specifies that the State Water Board will receive $0.6 million for stormwater management, and the Department of Water Resources will receive $32.8 million for the Integrated Regional Water Management Program.

Uncertainties Associated with Future Risks

In addition to current uncertainties associated with costs and funding, there are multiple uncertainties associated with the possibility of missing compliance dates. The first TMDL standards compliance dates for the LCC Watershed will be the interim metals milestones of 2017, 2020, and 2023, and the final compliance date of September 30, 2026. The final non-TMDL water quality standard target compliance date is projected to be sometime in 2040. Thus,

there will be many deadlines that must be met despite limited resources. Member agencies will need to set priorities and seek funding in order to meet the various compliance deadlines.

4.0 Selection of Watershed Control Measures

4.1 Control Measure Objectives

As required by Part III.C.5 of Order No. R4-2012-0175, the specific objectives of the control measures in this WMP include:

(1) Prevention or elimination of non-stormwater discharges to the MS4 that are a source of pollutants from the MS4 to receiving waters;

(2) Implementation of pollutant controls necessary to achieve all applicable interim and final water quality-based effluent limitations and/or receiving water limitations pursuant to corresponding compliance schedules; and

(3) Ensuring that discharges from the MS4 do not cause or contribute to exceedances of receiving water limitations.

In addition, a general objective is the selection of control measures that will facilitate cost-effective implementation of the Water Quality Improvement Strategy specified in Section 3 of this WMP.

4.2 Existing and Planned Control Measures

4.2.1 Control Measures in Effect

The control measures currently in effect are primarily the various control measures programs specified in Order No. 01-182, including the following:

- Public Information and Participation Program,
- Industrial/Commercial Facilities Control Program,
- Development Planning Program,
- Development Construction Program,
- Public Agency Activities Program, and
- Illicit Connection and Illicit Discharge Elimination Program

In addition, as shown in Table 4-5, all seven Cities sweep residential, commercial, and industrial areas on at least a weekly basis.

4.2.2 Existing Planning for Control Measures

As noted in Section 3.2, the Cities in the Watershed have contributed to the planning for implementation of SB 346 to largely remove copper in brake pads by January 1, 2025, 21 months before

the final compliance date for the copper TMDL for the Los Cerritos Channel Freshwater Watershed established by USEPA.

The Watershed Group also worked with Regional Water Board staff on the development of a Basin Plan Amendment to add an implementation plan and an implementation schedule for the Los Cerritos Channel TMDL for Metals into the Water Quality Control Plan for the Los Angeles Region. This amendment was adopted by the Regional Water Board on June 6, 2013, and approved by the State Water Board on February 6, 2014.

In addition, the Watershed Group has been discussing the use of the Safer Consumer Product Regulations adopted by the Department of Toxic Substances Control to reduce the zinc content of automobile and truck tires after 2016. The Group has also been reviewing local sources of zinc in preparation for developing local control measures for zinc as part of the first adaptive management review process.

4.3 Minimum Control Measures

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

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

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

4.3.1 Los Angeles County Flood Control District Minimum Control Measures

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

4.3.2. Assessment of Minimum Control Measures (Cities Only)

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

4.3.2.1. Development Construction Program

4.3.2.1.1. Assessment

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

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

4.3.2.1.2. Determination

The Cities will implement the MCMs as defined in §VI.D.8 of the MS4 Permit. To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Attachment E.

4.3.2.2. Industrial/Commercial Facilities Program

4.3.2.2.1. Assessment

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

4.3.2.2.2 Determination

Sections VI.D.6.d and VI.D.6.e of the MS4 Permit will be replaced with the language in Table 4l 4, which is located below in subsection 4.3.4 *New Fourth Term Permit Minimum Control Measures (Cities Only)* and is identified as MCMl ICFl 3.

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

The Permittee Industrial/Commercial Facilities will include tracking of critical sources and educating industrial facility managers with the intent of ensuring that all industrial facilities are implementing BMPs as required.

4.3.2.3. Illicit Connection and Illicit Discharges Elimination Program

4.3.2.3.1. Assessment

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

4.3.2.3.1 Determination

The Cities will implement the MCMs as defined in §VI.D.10 of the MS4 Permit. To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Attachment E.

4.3.2.4 Planning and Land Development Program

4.3.2.4.1. Assessment

Following MS4 Permit §VI.C.5.b.iv.1.a, the Planning and Land Development Program was not assessed for potential modifications.

4.3.2.4.2. Determination

The Cities will implement the MCMs as defined in §VI.D.7 of the MS4 Permit. To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Attachment E.

4.3.2.5 Public Agency Activities Program

4.3.2.5.1 Assessment

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

4.3.2.5.2 Determination

The Cities will implement the MCMs as defined in §VI.D.9 of the MS4 Permit. To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Attachment E.

4.3.2.6 Public Information and Participation Program

4.3.2.6.1 Assessment

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

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

4.3.2.6.2 Determination

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

Table 4-1: Elements of the PIPP

Permit section	Clarification
§VI.D.5.c.(i) Public Participation	Each City will participate in a Countywide sponsored PIPP to provide a means for public reporting of clogged catch basin inlets and illicit discharges/dumping, faded or missing catch basin labels, and general stormwater and non-stormwater pollution prevention information.
§VI.D.5.d Residential Outreach Program	Each City will work in conjunction with a Countywide sponsored PIPP to implement the Residential Outreach Program. Elements of program that will not be administered or implemented by the County will be addressed

	individually by each City. Through the adaptive management process, PIPP participation may develop into a watershed group or individual effort, or some combination of these approaches.

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

4.3.2.7 Progressive Enforcement and Interagency Coordination

4.3.2.7.1 Assessment

Following MS4 Permit §VI.C.5.b.iv.1.a, the Progressive Enforcement and Interagency Coordination Program was not assessed for potential modifications.

4.3.2.7.2 Determination

The Cities will implement the MCMs as defined in §VI.D.2 of the MS4 Permit. To assist the Cities in the development and implementation of a jurisdictional program, a guidance document is included in Attachment E.

4.3.3 Third Term Permit Minimum Control Measures

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

4.3.4 New Fourth Term Permit Minimum Control Measures (Cities Only)

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

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

4.3.4.1 Structural Controls

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

LID and Hydromodification

MS4 Permit §VI.D.7

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

Trash Excluder Installation

MS4 Permit §VI.D.9.h.vii.(1)

In areas that are not subject to a trash TMDL, the Public Agency Activities Program includes a requirement to install excluders (or equivalent devices) on or in Priority A (see §VI.D.9.h.iii.(1))) area catch basins or outfalls to prevent the discharge of trash to the MS4. For LA MS4 Permittees, the deadline is no later than four years after the effective date of the Permit. This provision may be supplanted by the statewide trash amendments for the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, which propose the installation of full-capture devices in the high priority land use areas of industrial, commercial, high-density residential and public transportation stations. A proposed final staff report was released on December 31, 2014, but no hearing date has been scheduled.

4.3.4.2 Nonstructural Controls

Table 4-3 lists the new and enhanced nonstructural City MCMs as well as the new and enhanced NSWD measures. The BMP effectiveness from Table 4-3 is based on similar BMPs listed in Tetra Tech's CLRP for Chollas Creek Watershed in San Diego County, 2012. The correlation of BMP effectiveness with WQPs is based on Table 4-2. The pages following Table 4-3 describe each of the listed controls.

Table 4-2 Pollutant Category versus Water Quality Classification

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

Table 4-3: New Fourth Term MS4 Permit Nonstructural MCMs (Cities only) and NSWDs

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

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency							
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Bellflower	Cerritos	Downey	Flood Control	Lakewood	Long Beach	Paramount	Signal Hill
8	MCM-DC-3	Increased inspection frequencies	◈	◈	◈	◆	◈	✗	✗	✗	✗	✗	✗	✗	✗
9	MCM-TRA-1	Enhanced staff training program	◈	◈	◈	◆	◈	✗	✗	✗	✗	✗	✗	✗	✗
		Illicit Discharge Detection/Elimination													
10	MCM-ICID-1	Enhanced IC/ID enforcement and written procedures	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗
11	NSWD-1	Outfall screening and source investigations	◈	◈	◈	◈	◆	✗	✗	✗	✗	✗	✗	✗	✗
12	MCM-TRA-1	Enhanced staff/contractor training	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗
		Dry weather runoff reduction													
13	NSWD-1	Outfall screening and source investigations	◈	◈	◈	◈	◆	✗	✗	✗	✗	✗	✗	✗	✗
14	NSWD-2	Enhanced conditions for NSWDs, including irrigation reduction	◆	◆	◆	◆	◆	✗	✗	✗	✗	✗	✗	✗	✗
		Public Information and Participation													
15	MCM-PIP-1	Stormwater resources on City website	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency							
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Bellflower	Cerritos	Downey	Flood Control	Lakewood	Long Beach	Paramount	Signal Hill
		Public Agency Activities													
16	MCM-PAA-1	Enhanced BMP requirements for fixed facility/field activities	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗
17	MCM-PAA-2	Reprioritization of catch basins and clean-out frequencies	◆	◈	◈	◆	◇	✗	✗	✗	✗	✗	✗	✗	✗
18	MCM-PAA-3	Integrated Pest Management Program	◈	◈	◈	◇	◇	✗	✗	✗	✗	✗	✗	✗	✗
19	MCM-PAA-4	Enhanced measures to control infiltration from sanitary sewers	◇	◆	◆	◇	◇	✗	✗	✗	✗	✗	✗	✗	✗
20	MCM-PAA-5	Inspection and maintenance of Permittee owned treatment controls	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗
21	MCM-TRA-1	Enhanced inspector/staff training	◈	◈	◈	◈	◈	✗	✗	✗	✗	✗	✗	✗	✗

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

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

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

Enhanced Staff/Contractor Training Programs MCM-TRA-1

MS4 Permit §VI.D.7.d.iv.(b), §VI.D.8.l, §VI.D.9.k, §VI.D.10.f

Measures introduced:

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

These new and enhanced provisions will increase the overall effectiveness of the Jurisdictional Stormwater Management Programs (JSWMPs).

Amend Development Regulations to Facilitate LID Implementation MCM-PLD-1

MS4 Permit §VI.C.4.c.i, §VI.D.7.d.i

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

Post-Construction BMP Tracking, Inspections, and Enforcement MCM-PLD-2

MS4 Permit: §VI.D.7.d.iv

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

Increase in Facility Types Inspected and Number of Inspections Conducted MCM-IFC-1

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

Measures introduced:

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

facilities will likely qualify for the NEC, the type and number of facilities requiring inspection under the MS4 Permit will still increase.

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

Business Assistance Program and BMP Notification MCM-IFC-2

MS4 Permit: §VI.D.6.c

Measures introduced:

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

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

Prioritize Facilities/Inspections Based on Water Quality Priorities MCM-IFC-3 (TCM-ICF-1)

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

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

Table 4-4

Replaces §VI.D.6.d and §VI.D.6.e of the MS4 Permit

VI.D.6.d Prioritize Critical Industrial/Commercial Sources

VI.D.6.d.i Prioritization Method

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

Prioritization factors

Factor	Description
A	Status of exposure of materials and industrial/commercial activities to stormwater
B	Identification of whether the facility is tributary to a waterbody segment with impairments[1] for pollutants that are also generated by the facility
C	Other factors determined by the City, such as size of facility, presence of exposed soil or history of stormwater violations

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

1. Collect necessary information to evaluate factors

Factor	Initial method	Subsequent method
A	Satellite imagery	Results of stormwater inspection
B	Cross reference Table A-ICF-1 with tributary TMDL/ 303(d) pollutants	Cross reference inspection results with tributary TMDL/ 303(d) pollutants
C	Varies	

2. Evaluate factors

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

3. Prioritize facilities

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

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

* No pollutant generation/impairment matches.

** ≥ 1 pollutant generation/impairment matches.

Figure ICF-1: Industrial/Commercial Facility Prioritization Scheme

Step 3 in Figure ICF-1 may also be expressed by the relationships A·B + C ≥ 1 → High, 1 > A·B + C > 0 → Medium and A·B + C = 0 → Low. The purpose of multiplying A and B is to scale the impact of the presence of the pollutants at a facility (B) by the likelihood that they will be discharged to the MS4 (A). Factor C quantifies water quality concerns

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

Table 4-4

Replaces §VI.D.6.d and §VI.D.6.e of the MS4 Permit

that are independent of A or B and as such is incorporated through addition. The purpose of this numerical approach is to provide consistency to the prioritization process. It is intended solely as a guide. The City may also prioritize facilities based on a qualitative assessment of factors A, B and C as listed in Figure ICF-1.

VI.D.6.d.i.(1) Prioritization Condition

The following condition will be met during the prioritization process: ***The total number of low priority facilities is less than or equal to 3 times the number of high priority facilities***. This condition is applied to maintain a minimum inspection frequency as explained in Section VI.D.6.e.i.

VI.D.6.d.i.(2) Prioritization Frequency

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

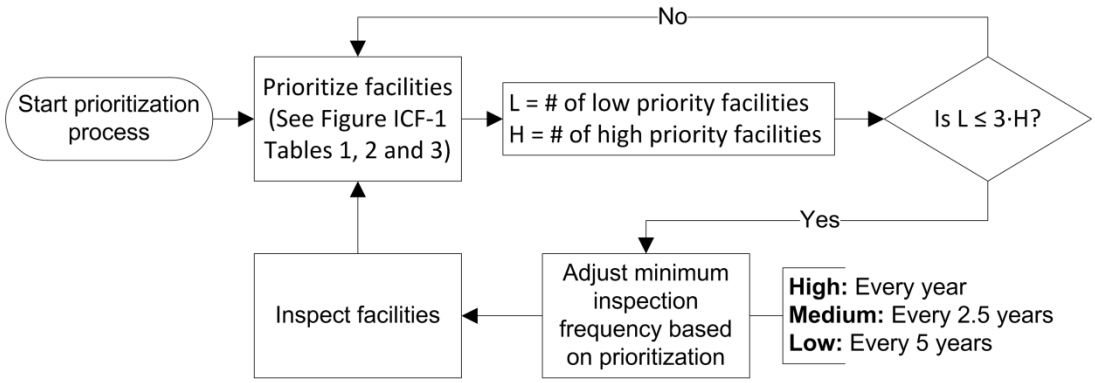


Figure ICF-2

VI.D.6.e Inspect Critical Industrial/Commercial Sources

VI.D.6.e.i Frequency of Industrial/Commercial Inspections

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

Each City will conduct the first compliance inspection for all industrial/commercial facilities within one year of the approval of the WMP. A minimum interval of 6 months between the first and the second mandatory compliance inspection is required.

VI.D.6.e.i.(1) Exclusions to the Frequency of Industrial Inspections

VI.D.6.e.i.(1).(a) Exclusion of Facilities Previously Inspected by the Regional Water Board

Each City will review the State Water Board's Stormwater Multiple Application and Report Tracking System (SMARTS) database at defined intervals to determine if an industrial facility has recently been inspected by the Regional Water Board. The first interval will occur approximately 2 years after the effective date of the Order. The

Table 4-4

Replaces §VI.D.6.d and §VI.D.6.e of the MS4 Permit
City does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24-month period. The second interval will occur approximately 4 years after the effective date of the Order. Likewise, the City does not need to inspect the facility if it is determined that the Regional Water Board conducted an inspection of the facility within the prior 24-month period. **VI.D.6.e.i.(1).(b) No Exposure Verification** As a component of the first mandatory inspection, each City will identify those facilities that have filed a No Exposure Certification with the State Water Board. Approximately 3 to 4 years after the effective date of the Order, each City will evaluate its inventory of industrial facilities and perform a second mandatory compliance inspection at a minimum of 25% of the facilities identified to have filed a No Exposure Certification. The purpose of this inspection is to verify the continuity of the no exposure status. **VI.D.6.e.ii Scope of Industrial/Commercial Inspections** **VI.D.6.e.ii.(1) Scope of Commercial Inspections** Each City will inspect all commercial facilities to confirm that stormwater and non-stormwater BMPs are being effectively implemented in compliance with municipal ordinances. At each facility, inspectors will verify that the operator is implementing effective source control BMPs for each corresponding activity. Each City will require implementation of additional BMPs where stormwater from the MS4 discharges to a significant ecological area (SEA), a waterbody subject to TMDL provisions in Part VI.E, or a CWA §303(d) listed impaired water body. Likewise, for those BMPs that are not adequately protective of water quality standards, a City may require additional site-specific controls. **VI.D.6.e.ii.(2) Scope of Industrial Inspections** Each City will confirm that each industrial facility: a) Has a current Waste Discharge Identification (WDID) number for coverage under the Industrial General Permit, and that a Stormwater Pollution Prevention Plan (SWPPP) is available on-site; or b) Has applied for, and has received a current No Exposure Certification for facilities subject to this requirement; c) Is effectively implementing BMPs in compliance with municipal ordinances. Facilities must implement the source control BMPs identified in Table 10, unless the pollutant generating activity does not occur. The Cities will require implementation of additional BMPs where stormwater from the MS4 discharges to a waterbody subject to TMDL Provisions in Part VI.E, or a CWA §303(d) listed impaired water body. Likewise, if the specified BMPs are not adequately protective of water quality standards, a City may require additional site-specific controls. For critical sources that discharge to MS4s that discharge to SEAs, each City will require operators to implement additional pollutant-specific controls to reduce pollutants in stormwater runoff that are causing or contributing to exceedances of water quality standards. d) Applicable industrial facilities identified as not having either a current WDID or No Exposure Certification will be notified that they must obtain coverage under the Industrial General Permit and will be referred to the Regional Water Board per the Progressive Enforcement Policy procedures identified in Part VI.D.2.

Enhanced Plan Review Program

MCM-DC-1

MS4 Permit: §VI.D.8.h, §VI.D.8.i

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

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

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

Enhanced Inspection Standards/BMP Requirements at Construction Sites MCM-DC-2

MS4 Permit: §VI.D.8.d, §VI.D.8.i, §VI.D.8.j

Measures introduced:

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

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

Increased Inspection Frequencies MCM-DC-3

MS4 Permit: §VI.D.8.j

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

Enhanced IC/ID Enforcement and Written Program Procedures MCM-ICID-1

MS4 Permit: §VI.D.2, §VI.D.10

Measures introduced:

- Develop and implement a Progressive Enforcement Policy that applies to the IC/ID Elimination, Development Construction, Planning and Land Development and Industrial/Commercial Facilities Programs. The Progressive Enforcement Policy is an augmentation of the policy listed

in the prior LA MS4 Permit, which was restricted to the Industrial/Commercial Facilities Program.

- Maintain written procedures for receiving complaints, conducting investigations and responding to spills.

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

Stormwater Resources on City Website MCM-PIP-1

MS4 Permit: §VI.D.5.d.i.(4)

Measures introduced:

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

Enhanced BMP Requirements for Fixed Facility/Field Activities MCM-PAA-1

MS4 Permit: §VI.D.9.e

Measures introduced:

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

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

Reprioritization of Catch Basins and Clean-Out Frequencies MCM-PAA-2

MS4 Permit: §VI.D.9.h.iii

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

- Determine priority areas and update the map of catch basins with GPS coordinates and priority.
- Include the rationale or data to support the priority designations.

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

Integrated Pest Management Program MCM-PAA-3

MS4 Permit: §VI.D.9.g

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

Enhanced Measures to Control Infiltration from Sanitary Sewers MCM-PAA-4

MS4 Permit: §VI.D.9.ix

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

Inspection and Maintenance of Permittee-Owned Treatment Controls MCM-PAA-5

MS4 Permit: §VI.D.9.x

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

4.4 Non-Stormwater Discharge Control Measures

4.4.1 Non-Structural Control Measures

Section 3.3 discusses the Watershed's overall runoff reduction strategy. The principal non-stormwater control measure being implemented in the Watershed is water conservation. Many of the municipal water conservation programs within the Watershed were stimulated by the approval of AB 1881, the Water Conservation in Landscaping Act, in 2006. The current drought has provided additional incentive to conserve water. The results of water conservation programs within the watershed are now seen in dry-weather monitoring at the Stearns Street monitoring site above the discharge point from the freshwater channel into the Estuary at Atherton Street in Long Beach. The average dry-weather flow at Stearns Street was estimated in the Metals TMDLs to be 2.35 cfs based on sampling during the 2001-2009 time frame. Current data indicates that average dry-weather flows are less than 0.5 cfs.

The second non-structural measure implemented within the Watershed is improved irrigation practices to reduce the amount of water used and the discharge of excess water to the storm drain system. Continued improvements by municipalities and education of residents and businesses should further reduce non-stormwater discharges.

In addition, the Industrial/Commercial Facilities Inspection Program and the Construction Site Inspection Program will be used to reduce non-stormwater discharges.

4.4.2 Structural Control Measures

Physically modifying irrigation systems to substitute sub-surface irrigation for surface irrigation and realigning spray leads to prevent overspray onto sidewalks and streets will be implemented over time at public facilities, as funding becomes available. In addition, residents and businesses will be encouraged to make similar improvements to further reduce non-stormwater discharges.

4.5 TMDL Control Measures

4.5.1 Non-Structural Control Measures

Since the only TMDLs currently applicable to the Los Cerritos Channel are the Metals TMDLs established by USEPA and the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL adopted by the Regional Water Board, the TMDL non-structural control measures implemented in and for the Watershed will relate to metals and legacy organics. As noted in Section 3, these measures will emphasize source control and TSS reduction. The two metals requiring reductions according to the Los Cerritos Channel Metals TMDLs are copper and zinc. There is also a TMDL for lead. However, after review and replication of a translator study, EPA concluded that no further lead reductions are required. The majority of copper reduction is anticipated to come from implementation of SB 346, which requires the reduction in most brake pads sold in California to 5% copper in 2021 and 0.5% in 2025.

Another significant source of copper is copper-based algaecides. These are used frequently to treat swimming pools. If the phase-out of copper in brake pads does not bring the Watershed into compliance with copper waste load allocations, Permittees will use outreach programs to encourage residents to stop using copper-based algaecides. Also, additional local non-structural controls such as regulating copper roofs, cooper roof gutters, and downspouts may be needed. However, this may not be necessary because many of the friction material manufacturers are moving directly to no copper added brake pads by 2021. This possibility was analyzed as scenario one in the “Estimate of Urban Runoff Copper Reduction in Los Angeles County from Brake Pad Copper Reduction Mandated by SB 346.” In addition, the California Stormwater Quality Association recently released a Technical Memo entitled, “Brake Pad Copper Reduction – Metrics for Tracking Progress.” This memo describes recent progress in removal of copper from brake pads, and describes metrics that will be used to track future reductions. (See Attachment D.)

Reduction of zinc discharges to the receiving waters is also likely to involve non-structural measures. As discussed in Section 3 and above in Section 4.2.2, the Watershed Group is planning to work with others to use the Department of Toxic Substances Control’s Safer Consumer Product Regulations to reduce the zinc in tires, one of the greatest sources of zinc in the metropolitan area. The Permittees may also find it necessary to adopt ordinances to regulate local sources of zinc, including the widespread outdoor use of galvanized metal, another major source of zinc.

In addition, the Watershed Group is monitoring the research related to the potential of reducing lead in aviation gasoline, or Avgas, that is used in piston engine aircraft, primarily general aviation aircraft.

USEPA has estimated that approximately 50% of lead in metropolitan atmospheric deposition comes from Avgas. A reduction of lead in Avgas could result in a further reduction of lead in the Los Cerritos Channel Watershed because the City of Long Beach is home to many general aviation aircraft.

Implementation of the TSS reduction strategy discussed in Section 3.0 will involve both non-structural and structural measures. The non-structural measures are likely to be ordinances that require landscaping, erosion control, and sediment control on vacant lots and other significant sources of exposed dirt. There will also likely be agreements developed between Cities and electrical utilities regarding erosion and sediment control in transmission line rights-of-way.

The proposed enhanced sweeping will use a combination of regenerative and vacuum sweepers. Major arterials, major intersections, median curbs, commercial, and industrial areas will be swept more frequently in the month preceding the rainy season. In addition, owners of private parking lots will initially be encouraged to enhance their sweeping programs. Ultimately, parking lot sweeping ordinances may be necessary to ensure that parking lots are swept sufficiently well to remove the fine metal particles resulting from atmospheric deposition and direct deposition from tire wear and braking, as well as other fine sediment particles. The need for future ordinances will be considered during the initial adaptive management process. Several Watershed Group members have already begun using regenerative and vacuum sweepers that are better able to capture fine particles (See Table 4-**5**, Street Sweeping Survey Table below.) The City of Long Beach continues to use broom sweepers, but has begun considering possible modifications to its street sweeping program. However, recent elections resulted in a new mayor and several new members of the City Council, and concluding the street sweeping review has been delayed. Any changes to the Long Beach street sweeping program will be addressed through the adaptive management process.

The RAA has assumed that non-structural control measures will result in a 10% pollutant reduction. The Watershed Group believes this is a conservative assumption. Implementation of SB 346 is projected to reduce copper pollution by over 60%. In addition, the Group has already seen a tremendous reduction in dry-weather runoff due primarily to non-structural control measures such as irrigation reduction requirements. Also, implementation of the TSS reduction strategy is expected to reduce TSS discharges to the Los Cerritos Channel by 20% by 2020. This will greatly reduce the sediment transport mechanism for metals, legacy organics, and bacteria, and thereby reduce pollutant loads. The Group also expects future reductions in zinc through the application of the Safer Consumer Product Regulations for tires and a reduction in zinc discharges through the coating of exposed zinc surfaces over time. Enhancement of street sweeping practices, such as median sweeping, intersection sweeping, and frequency of sweeping certain areas, are expected to further reduce copper, zinc, sediment, and trash. In addition, the plastic bag bans currently being implemented are anticipated to reduce plastics in the receiving waters. Industrial inspections will also reduce a number of pollutants.

As recognized by a footnote to Table K-7 and other tables in Attachment K of the Permit, the Participating Agencies have entered into an Amended Consent Decree with the United States and the State of California, including the Regional Board. The footnote specifically states: “The requirements of this Order to implement the obligations of [the Dominguez Channel and Greater Los Angeles and Long

Beach Harbor Waters Toxic Pollutants TMDL] do not apply to a Permittee to the extent that it is determined that the Permittee has been released from that obligation pursuant to the Amended Consent Decree entered in *United States v. Montrose Chemical Corp.*, Case No. 90-3122 AAH (JRx)." The submission of this WMP and its associated CIMP and any action or implementation taken pursuant to it shall not constitute a waiver of any such release of obligations established by that Amended Consent Decree.

Table 4-5: Los Cerritos Channel Street Sweeping Survey

City	Type of Sweeper	Frequency			Ordinance that restricts parking on a sweeping day	Does your city utilize any special procedures for sweeping major intersections? If yes, please describe those procedures.	Does your city have a program for municipal parking lot sweeping? If it does, please list the frequency/schedule	Does your city have requirements for private parking lots?
		Residential	Commercial	Industrial				
Bellflower	Vacuum	Weekly	Weekly	Weekly	Yes	Regular sweeping at intersections	Parking lots are swept once per week	No
Cerritos	Regenerative	Weekly	Weekly	Weekly	Yes	No	Yes. All City lots are swept once per week	No
Downey	Regenerative	Weekly	2x per week	Weekly	Yes	No	Yes – weekly in early morning	No
Lakewood	Regenerative	Weekly	Weekly	Weekly	Yes	Major intersections swept early morning before traffic	Yes-weekly	No
Long Beach	Broom Sweepers	Weekly	Weekly	Weekly	Yes	No	---	---
Paramount	Regenerative	Weekly	Weekly	Weekly	Yes	Major intersections are swept twice weekly	City owned lots of Parks and City facilities are swept once per week	No
Signal Hill	Regenerative	Weekly	Weekly	Weekly	Yes	All major intersections are swept	Upon request	Yes (see Municipal Code 12.16.060)

4.5.2 Structural Control Measures

The initial structural measures to control TMDL pollutants are anticipated to be low flow diversions and water capture measures, including green streets, LID, and stormwater capture and infiltrate or use facilities that will also capture non-stormwater discharges. As noted in Section 3.5, the implementation of green streets and LID projects will generally be dependent on the initiation and completion of redevelopment projects and road construction projects in the largely built-out Watershed.

Permittees within the Watershed are currently looking for opportunities to construct green streets. One approach has been the incorporation of green street elements into proposed regional corridor projects. One example is the proposed Lakewood Boulevard Corridor Capacity Enhancement Project. The City of Lakewood is proposing a complete streets project on Lakewood Boulevard from Del Amo Boulevard at the southern City limits to the northern City limits just north of Ashworth Street. The City of Lakewood portion of the project is approximately 1.5 miles in length. This is the first phase of a regional corridor that may eventually extend from Long Beach through Bellflower and Downey to Pico Rivera. The primary focus of the project is to increase the capacity of Lakewood Boulevard through multimodal methods including enhancing transit capacity, and adding bike lanes and pedestrian walkways, as well as increasing intersection capacity through additional turn lanes and strengthening pavement to accommodate for the additional transit and automobile traffic. The Lakewood Public Works Department is working with its consultants to develop Lakewood Boulevard into a green complete street.

As part of the complete streets project, Lakewood Boulevard will include, to the "maximum extent practicable," infiltration stormwater treatment Best Management Practices (BMPs) in compliance with the Los Angeles County MS4 Permit and City of Lakewood Low Impact Development (LID) Ordinance and Green Streets Policy.

The project is in the conceptual stage, and it is being planned to provide approximately 200,000 square feet of stormwater treatment. Methods of treatment are anticipated to consist primarily of vegetated bio-swales, bio-infiltration basins, and infiltration trenches, with curb cuts to allow water to flow into the facilities. A meandering median swale to allow bio-infiltration as well as parkway bio-swales will be included throughout much of the project length. Other stormwater treatment BMPs, where feasible, may include rain gardens, porous pavement, and other LID treatment methods.

In addition to providing stormwater treatment BMPs, the project proposes to replace the existing irrigated turf with drought adaptive trees and shrubs to minimize water use. This planting will reduce irrigation, maintenance, and plant waste, which also provides the added benefits of reducing the project area's "carbon footprint." The irrigation system would be modified for low volume use and future recycled water when available.

The Gateway COG TAC, which guides the use of Gateway COG Measure R regional funds, has approved $2.6 million for preliminary design, environmental clearance, and final design. The TAC's approval will go to the METRO Board for final approval in May.

Completion of major water capture and use projects, with infiltration when feasible, will be dependent on available funding. The Watershed Group has identified 13 first order (Highest Priority) sites for such projects in public parks and golf courses, plus eight second order sites in utility easements. These sites are listed in Tables 4-5 and 4-6 and shown in Figures 4-1 and 4-2. As noted in Section 3.5, the Watershed Group has identified the first six sites to be addressed and will be pursuing funding to complete initial designs for three of these sites in preparation for seeking grant funding. Assuming an average capacity of eight acre-feet (AF), the Watershed Group anticipated that the first 13 water capture and use projects could have a total stormwater capture capacity of 104 AF and the second eight could add another 64 AF of stormwater capture, if they can be constructed underground within the transmission line rights-of-way. The need for additional centralized water capture will be evaluated through the adaptive management process.

These first and second order major BMP sites are proposed to handle 168 acre-feet of the 204.5 acre-feet of potential regional BMP volume shown in Table 9-5 of the RAA. The Watershed Group has identified sufficient potential additional BMP sites at schools in the Watershed. However, these sites have not been included in the WMP at this time because negotiations with school districts have only just begun. The Group has also identified potential sites involving private property, but these sites may not be necessary. Further additional Regional BMP sites will be evaluated through the adaptive management process. In addition, the Group expects the regional capture volume to be reduced through implementation of source control measures.

The need for additional sites will be influenced by the effectiveness of non-structural control measures such as implementation of SB 346, the runoff reduction program, the TSS reduction program, and the implementation of green streets and other LID projects. If additional major underground water capture facilities are needed, they also will be located under parks, golf courses, utility easements, and schools to the extent feasible. Each adaptive management process cycle will provide additional specific information on the number, type, and location of structural and non-structural BMPs. Additional information on the anticipated timing of BMPs is found in Section 6.

Table 4-6: Potential Los Cerritos Channel Watershed First Order Major BMP Sites

(Public Park and Golf Courses)

No.	Name	Latitude	Longitude	WMMS Sub-watershed	Sub-basin
1	Potential Progress Park BMP Site (Paramount)	33.892402°	-118.150910°	5523	SB 9
2	Potential Bike Trail @ Clark Ave BMP Site (Bellflower)	33.890138°	-118.133766°	5518	SB 8
3	Potential Sims Park BMP Site (Bellflower)	33.883770°	-118.133772°	5517	SB 8
4	Potential Mayfair Park BMP Site (Lakewood)	33.857028°	-118.132101°	5517	SB 10
5	Potential Caruthers Park BMP Site (Bellflower)	33.878452°	-118.111056°	5507	SB 10
6	Potential Heartwell Park Palo Verde Channel BMP Site (Long Beach)	33.830487°	-118.108951°	5505	SB 10
7	Potential Long Beach Junior Golf Course BMP Site (Long Beach)	33.830422°	-118.104780°	5505	SB 10
8	Potential Heartwell Park Clark Channel BMP Site (Long Beach)	33.830761°	-118.129573°	5514	SB 7
9	Potential Pan American Park BMP Site (Long Beach)	33.842283°	-118.131496°	5514	SB 7
10	Potential Skylinks Wardlow Channel BMP Site (Long Beach)	33.822990°	-118.135062°	5515	SB 6
11	Potential Wardlow Park BMP Site (Long Beach)	33.821295°	-118.129327°	5511	SB 5

12	Potential Skylinks LCC BMP Site (Long Beach)	33.812905°	-118.138772°	5509	SB 4
13	Potential Reservoir Park BMP Site (Signal Hill)	33.818430°	-118.174593°	5510	SB 4

Table 4-7: Potential Los Cerritos Channel Watershed Second Order Major BMP Sites

(Transmission Rights-of-Way)

No.	Name	Latitude	Longitude	WMMS Sub-watershed	Sub-basin
1	Potential Transmission R-O-W BMP Site [East of Downey Avenue in Paramount]	33.899399°	-118.152599°	5524	SB 9
2	Potential Transmission R-O-W BMP Site [Dunbar/Mayne in Bellflower]	33.886455°	-118.147181°	5519	SB 8/9
3	Potential Transmission R-O-W BMP Site [South of Paramount on Downey Ave. in Bellflower]	33.879384°	-118.151030°	5523	SB 9
4	Potential Transmission R-O-W BMP Site [East of Clark Ave. in Lakewood]	33.868742°	-118.133477°	5517	SB 8
5	Potential Transmission R-O-W BMP Site [East of Lakewood Blvd. in Lakewood]	33.868338°	-118.141666°	5517	SB 8
6	Potential Transmission R-O-W BMP Site [West of Community Gardens in Lakewood]	33.854136°	-118.113120°	5507	SB 10
7	Potential Transmission R-O-W BMP Site [Candlewood East of Woodruff in Lakewood]	33.852845°	-118.114556°	5506	SB 10
8	Potential Transmission R-O-W [West of Palo Verde Channel in Lakewood]	33.849443°	-118.109604°	5506	SB 10

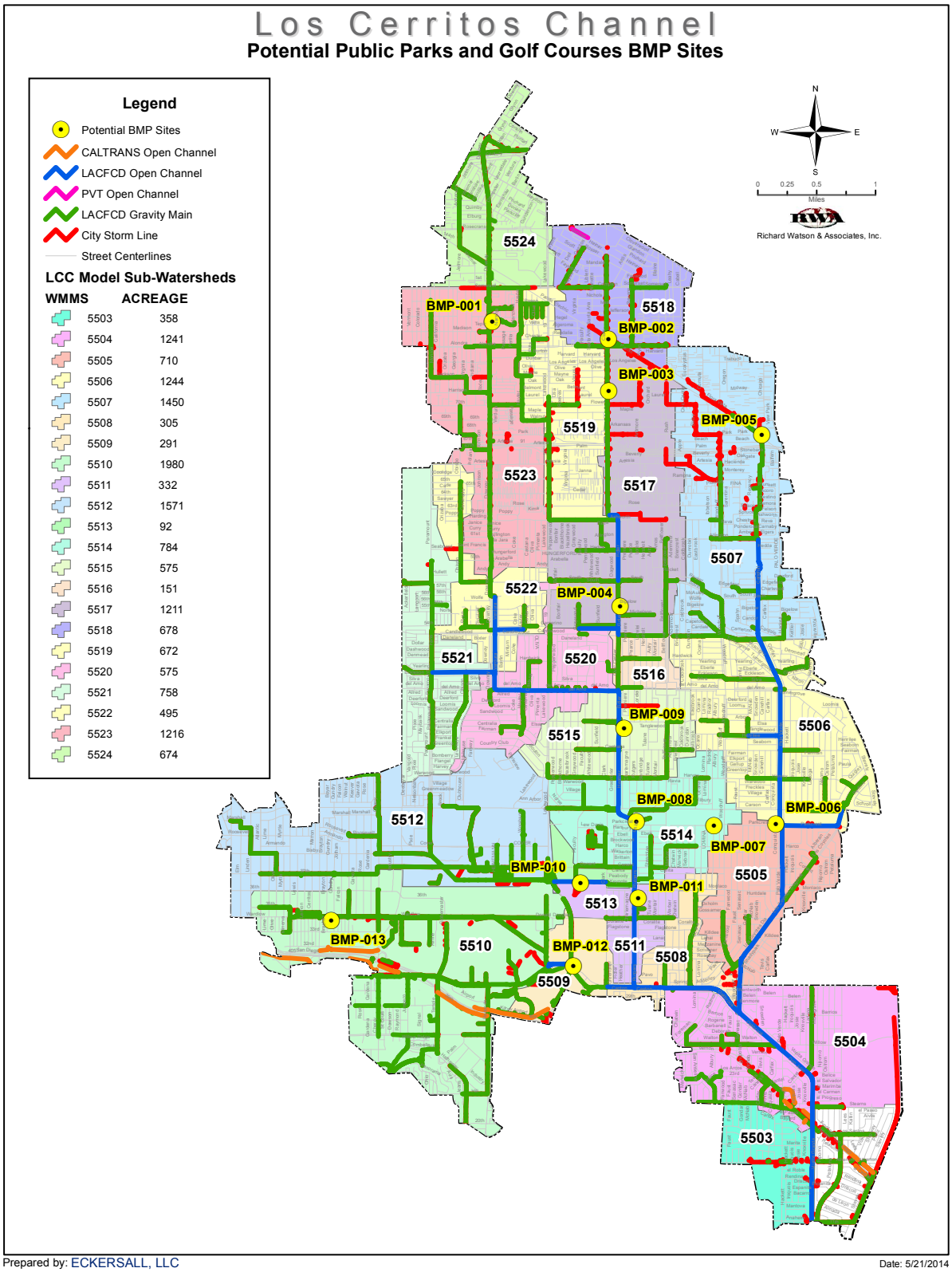


Figure 4-1: LCC Potential Public Parks and Golf Course BMP Sites

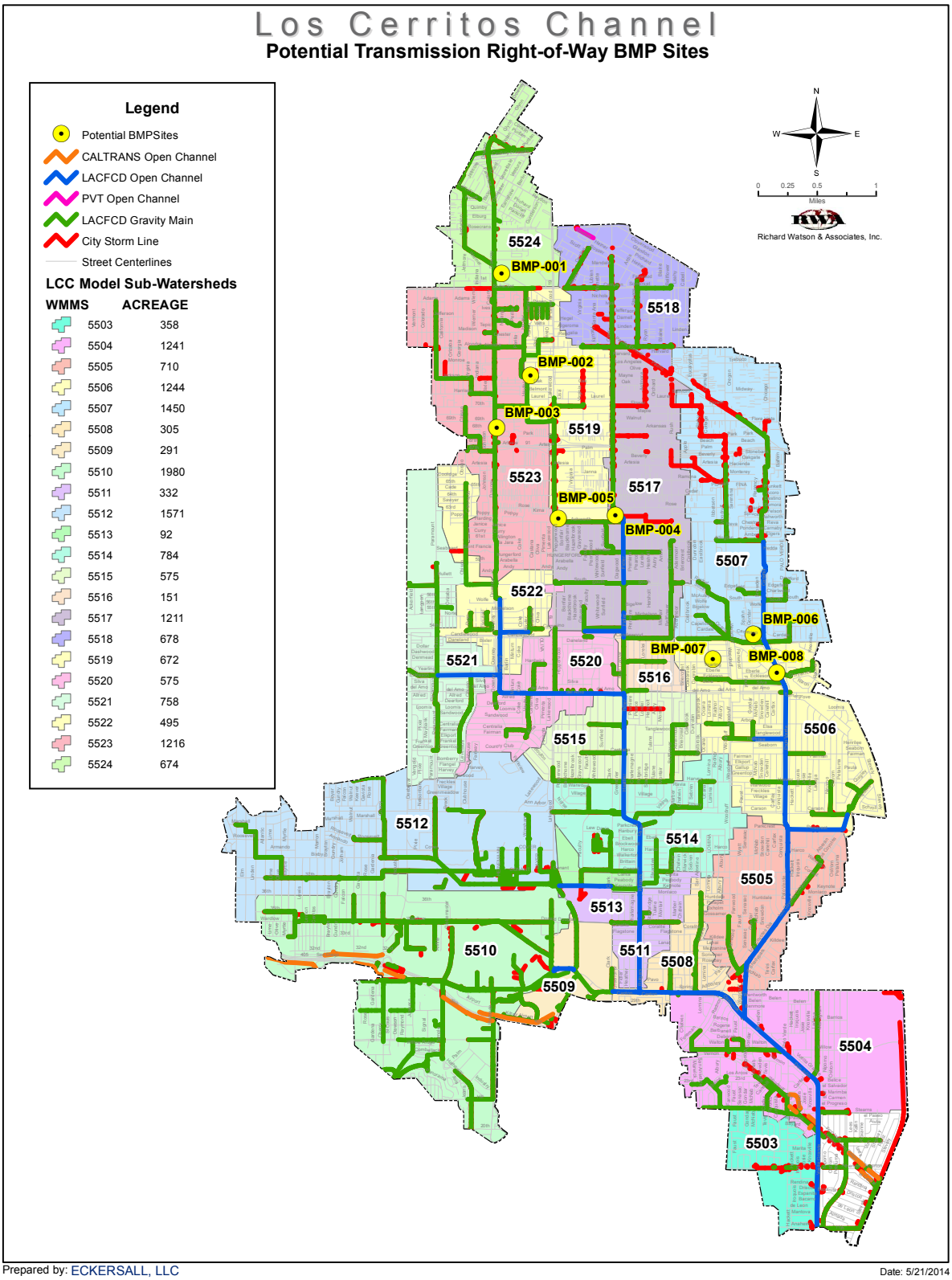


Figure 4-2: LCC Potential Transmission ROW BMP Sites

4.6 Non-TMDL Impaired Waters Control Measures

4.6.1 Non-Structural Control Measures

The non-structural control measures implemented to address non-TMDL impaired waters will focus on implementation of minimum control measures, particularly commercial/industrial inspections, construction inspections, business outreach, and residential outreach. In addition, the Watershed Group will monitor and support, where appropriate, extended producer responsibility and packaging reductions proposed by the California Product Stewardship Council. Future bacteria control measures will be evaluated through the adaptive management process.

4.6.2 Structural Control Measures

The primary structural measures to control trash will be installation of full capture devices in priority land use areas pursuant to the State Water Board trash amendments when they are adopted. The Watershed Group proposes to work with the Regional Water Board regarding the requirements in Order Part VI.D.9.h.vii(1) related to installation of trash excluders in light of the proposed trash amendments. Future bacteria control measures will be enacted through the adaptive management process.

4.7 Control Measures for Non-Impairment Pollutants

4.7.1 Non-Structural Control Measures

The non-structural control measures to be implemented to control non-impairment pollutants consist primarily of TSS reduction and the full range of minimum control measures, especially the inspection and outreach measures. The Watershed Group will also emphasize true source control and operational source control to reduce the release of potential pollutants. The Group will also monitor and support, when appropriate, extended producer responsibility, including take-back measures that will reduce the probability of pollutant releases.

4.7.2 Structural Control Measures

The Watershed Group is not proposing any special structural control measures to address non-impairment pollutants. Rather, it will depend on LID, green streets, stormwater capture, and other structural measures implemented to address TMDL and non-TMDL requirements to also help control non-impairment pollutants indicated by monitoring results.

4.8 Control Measures To Be Implemented at the Watershed and Sub-Watershed Levels

4.8.1 Non-Structural Control Measures

The non-structural control measures being implemented at the Watershed and sub-watershed scales involve the development of model ordinances, support for true source control and operational source

control measures, coordination of business outreach and residential outreach, and preliminary design of proto-type water-capture facilities.

4.8.2 Structural Control Measures

Structural measures to be implemented at the Watershed and sub-watershed scales will likely include water capture devices. These will likely be sub-watershed projects developed pursuant to specific MOUs between the benefitting agencies. If a regional or sub-regional stormwater fee is established, construction of Watershed and/or subwatershed projects will become much more feasible. However, Memoranda of Understanding would be required to determine the allocation of benefits and agreement on funding.

4.9 Control Measures To Be Implemented at the Jurisdictional Level

4.9.1 Non-Structural Control Measures

Individual jurisdictions within the Watershed will be responsible for implementation of minimum control measures. They will also be responsible for model ordinances and adopting appropriate targeted implementation ordinances, such as ordinances to implement the TSS Reduction Strategy. In addition, they will be asked to support source control measures such as extended producer responsibility, when appropriate, and to comment on proposed legislation and/or regulations.

4.9.2 Structural Control Measures

Individual jurisdictions will be responsible for installation and maintenance of green streets and LID measures. They may also construct water capture and water treatment facilities when grants are available or sustainable stormwater fee measures have been implemented.

4.10 Overview of Implementation Responsibilities

The Watershed Management Program has been designed to emphasize multi-jurisdictional watershed cooperation to the extent feasible. Individual jurisdictions are responsible for implementation of minimum control measures and enhanced street sweeping, as well as the implementation of green street policies and LID ordinances. Jurisdictions discharging to planned major water capture facilities will be responsible for design and construction of the water capture facilities pursuant to agreements to be developed prior to initiating design and construction. Jurisdictional responsibilities for design of the initial major water capture facilities are shown in Tables 6-5, 6-7, 6-9, and 6-11, and jurisdictional responsibilities by sub-basin are shown in Table 6-12.

The LACFCD will work with the Watershed group in its efforts to address source controls; assess, develop, and pursue funding for structural BMPs, and promote the use of water reuse and infiltration. As regional project scopes are further refined, the LACFCD will contribute to the WMP projects on a case-by-case basis, agreed upon with the Watershed Group.

5.0 Compliance with Receiving Water Limitations

This section explains how the Watershed Group believes it will come into compliance with receiving water limitations. Additional information on how compliance can be achieved through stormwater capture is contained in the Reasonable Assurance Analysis (RAA) prepared for the Lower Los Angeles River, the Los Cerritos Channel, and the Lower San Gabriel River Watersheds. This RAA is described in Section 8 and found in Attachment A.

5.1 Compliance with Receiving Water Limitations Addressed by a TMDL

5.1.1 Copper

The Los Cerritos Channel TMDL for copper contains interim compliance dates of September 30, 2017, September 30, 2020, and September 30, 2023, as well as a final compliance date of September 30, 2026, for both dry weather and wet weather. Current monitoring indicates that the Watershed has already achieved compliance with water quality standards for copper during dry weather, most likely due to the recent large reduction in average dry-weather flows from 2.35 cfs to less than 0.5 cfs at Stearns Street.

The wet-weather compliance date for 2017 requires that 10% of the total drainage area served by the storm drain system effectively meets the wet-weather WLAs. The RAA prepared by Tetra Tech with the assistance of Paradigm Environmental indicates that the Watershed will meet the 2017 interim milestone through implementation of non-structural control measures, including the targeted total suspended solids (TSS) reduction program. The Watershed Group will demonstrate this reduction either by a 10% reduction in loadings as measured at the Stearns Street monitoring site or by monitoring results demonstrating that a sub-basin containing 10% or more of the drainage area served by the storm drain system meets the wet weather WLAs for copper. For September 30, 2020, during the next 5-year permit cycle, the requirement is that 35% of the total drainage area served by the storm drain system effectively meet the wet-weather WLAs. The Watershed Group expects this to be met by the cumulative impacts of implementation of SB 346, implementation of the TSS reduction strategy, implementation of green streets policies and LID ordinances, and implementation of stormwater capture and infiltrate and/or use projects, enhanced street-sweeping, and continued implementation of minimum control measures. These same measures will result in compliance with the 2023 interim milestone and the 2026 final compliance requirements.

5.2 Compliance with Receiving Water Limitations Not Otherwise Addressed by a TMDL

5.2.1 Impairment Pollutants in the Same Class as Those Addressed in a TMDL

Although coliform bacteria and enterococcus are weakly associated with sediment, the Watershed Group has concluded that none of the Category 2 or Category 3 pollutants are in the same class as those pollutants addressed by a TMDL.

5.2.2 Impairment Pollutants Not in the Same Class as Those Addressed in a TMDL

This WMP addresses five impairment pollutants not in the same class as those addressed in a TMDL. These are the Category 2 pollutants ammonia, bis(2-ethylhexyl)phthalate (DEHP), coliform bacteria, trash, and pH. Ammonia is proposed for delisting, and the Watershed Group does not propose to address it at this time. (See Section 2 for more details.)

Bis(2-ethylhexyl)phthalate is a plasticizer associated with plastic trash so it will be addressed with trash. The Watershed Group proposes to address trash through the process outlined in the State Water Board's proposed trash amendments to the California Ocean Plan and the Inland Surface Waters, Enclosed Bays, and Estuaries Plan. Once the State Water Board adopts these amendments, this WMP will be amended through the adaptive management process to specify in more detail how the Watershed will meet trash and DEHP water quality standards.

The Proposed *Final Staff Report for the Amendments to the Water Quality Control Plan for the Ocean Waters of California to Control Trash* and *Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California* will apply to all surface waters of the State and specify a time schedule of 10 years from the first implementing permit, but no later than 15 years from the effective date of the Trash Amendments. Because trash will be addressed in accordance with the Trash Amendments, the Watershed Group believes that its proposed 10-year schedule to meet trash and DEHP water quality standards is as soon as the standards can realistically be met.

The 303(d) list includes coliform bacteria (now *E. coli*), which will be partially addressed by runoff reduction and stormwater capture. It will also be addressed by ongoing implementation of several of the minimum control measures. In order to address coliform bacteria (*E. coli*) as soon as possible, the Watershed Group plans to first address dry-weather bacteria. The Group plans to do this through further reductions in dry-weather flows through implementation of LID ordinances and green streets policies and through dry-weather diversion to sanitary sewers or to infiltration or bioretention facilities. Further reductions in dry-weather flows (now averaging less than 0.5 cfs at Stearns Street) will reduce dry-weather bacteria exceedances and possibly

eliminate them in 10 years. This is as soon as realistically possible to eliminate dry weather flows. Eliminating bacteria exceedance during dry weather would bring the channel into compliance with *E.* coli standards for approximately 90% of the year. The Watershed Group proposes to address bacteria more directly during the second and third adaptive management reviews after members have had a chance to review the effectiveness of runoff reduction and ongoing implementation of minimum control measures on *E. coli* counts in the receiving waters. The Group will then evaluate the potential need for alternative measures. The only way the Permittees currently know to reduce wet-weather bacteria exceedances is to obtain a high-flow suspension and to capture stormwater. Twenty to twenty-five years will be needed to design, fund, and build enough capacity to significantly reduce wet-weather bacteria exceedances. Therefore, the Watershed Group believes that 2040 is as soon as wet-weather bacteria standards can be realistically met.

The Permittees do not propose addressing ammonia and pH in the watershed through control measures. Rather, as noted in Section 2, they believe there is sufficient documentation to delist them. The last impairment is a condition – not a pollutant. It is a pH exceedance associated with shallow water flowing over a concrete surface and sunshine. It is a natural dry-weather condition. The Watershed Group proposes to work with Regional Water Board staff on a way to delist pH since it is a natural condition – not a pollutant. The LCC Watershed Group will monitor ammonia and pH as part of its Coordinated Integrated Monitoring Program, and will re-evaluate ammonia as part of the adaptive management evaluation, the first of which will be conducted no later than April 28, 2017, with follow-up evaluations every two years thereafter.

5.2.3 Non-Impairment Pollutants

The only Category 3 pollutants included in this WMP are MBAS and enterococcus. Enterococcus is not a freshwater problem. It is included in the WMP because the principal monitoring site for the Watershed (Stearns Street) is located just upstream of the saline Los Cerritos Channel Estuary. It will be addressed in the same manner as *E. coli* is addressed.

The Watershed Group believes that it may be able to come into compliance with MBAS standards sooner because of the limited number of exceedances and the low level of the exceedances (see Table 2-12). The member cities will use the inspection process to educate maintenance organizations and individuals about not letting detergents and other cleaning products enter the storm drain. The Group is going to target eliminating MBAS exceedances by 2020. The Group believes that it should be possible to change the behavior of the target audience in five years. If the data do not demonstrate success by the time of the second adaptive management review, the Group will implement other measures. Table 2-12 continues to show a final wet weather compliance date of 2025 in case education and inspection measures are not sufficient to achieve compliance with water quality standards.

5.3 Total Suspended Solids Reduction Quantification

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

$$\boldsymbol{A = RKLS}$$

where

$\boldsymbol{A}$ = Spatially and temporally averaged soil loss per unit area per unit time. The result is expressed in the units elected for $\boldsymbol{K}$ and $\boldsymbol{R}$.

$\boldsymbol{R}$= Rainfall-runoff erosivity factor (per unit time, generally one year),

$\boldsymbol{K}$= Soil erodibility factor (mass per unit area – an area density – generally tons per acre),

$\boldsymbol{L}$= Slope length factor and

$\boldsymbol{S}$= Slope steepness factor.

Using local values of $\boldsymbol{R}$, $\boldsymbol{K}$ and $\boldsymbol{LS}$ obtained through maps available on the State Water Resources Control Board's website for the Construction General Permit[1],

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

giving

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

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

During the cooperative preparation of the Lower San Gabriel River, Lower Los Angeles River and Los Cerritos Channel WMPs, several participating agencies provided estimates of exposed soil within their jurisdiction that were not related to construction activities. The City of Bellflower field-verified these estimates, which totaled approximately 18 acres or about 0.5% of the City. Following the calculated value for $\boldsymbol{A}$, this equates to approximately 100 tons of soil loss per year.The City of Signal Hill determined that 70.3 acres of the 531 acres within the city that drain

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

to the Los Cerritos Channel consists of undeveloped vacant land (13%)—however this is an anomalous circumstance specific to the City. Applying the 70.3 acres to Signal Hill and extrapolating the 0.5% to the remaining area of the Los Cerritos Channel Watershed (17,179 acres), the soil loss tonnage is

$$\boldsymbol{M_{TSS} = fWA = (0.005 \cdot 17,179\ acres + 70.3\ acres)\left(5.76\ \frac{tons}{acre\ year}\right)}$$

$$\boldsymbol{M_{TSS} \approx 156\ \text{acres}\left(5.76\ \frac{tons}{acre\ year}\right)}$$

$$\boldsymbol{M_{TSS} \approx 900\ \frac{tons}{acre\ year}}$$

where

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

Historical monitoring results from the watershed suggest that approximately 1.8 grams of zinc adheres to every kilogram of TSS, so that the zinc discharge $\boldsymbol{M_{Zn}}$ associated with $\boldsymbol{M_{TSS}}$ is

$$\boldsymbol{M_{Zn} \approx \left(\frac{1.8}{1000}\right) M_{TSS}}$$
$$\boldsymbol{M_{Zn} \approx \left(\frac{1.8}{1000}\right)\left(900\ \frac{tons}{year}\right)\left(\frac{2000\ lbs}{1\ ton}\right)}$$
$$\boldsymbol{M_{Zn} \approx 3,200\ \frac{lbs}{year}\ or\ 1,450\ \frac{kg}{year}.}$$

The RAA predicts an annual zinc loading of 2,607 kg for the average storm year. Assuming that within the term of the MS4 Permits the TSS Reduction Strategy approaches an effectiveness goal of 10% (145 kg/year), this would equate to a load reduction of **5.5%**. Equivalently, an effectiveness of 20% corresponds to a load reduction of **11%** and an effectiveness of 30% corresponds to a reduction of **16.5%**. Reductions of this magnitude provide support for the 10% load reduction assumed for non-modeled controls. Further development of the TSS Reduction program is anticipated to meaningfully aid in the achievement of targeted load reductions.

5.4 Addressing Limiting Pollutants Drives Other Pollutant Reduction

The identification of limiting pollutants – *E. coli* in dry weather and zinc in wet weather – in sub-sections 5.3.1 and 5.3.2 of the Reasonable Assurance Analysis (RAA) was intended to identify the most challenging pollutants so that the Permittees could develop control measures to address these pollutants that would also address other pollutants. These control measures will especially

address the category 2 and 3 pollutants – with the exception of ammonia and pH that are proposed for delisting (see Section 2).

All Category 2 and Category 3 pollutants will be addressed through the program described above to greatly reduce or eliminate dry-weather discharges in the channel system as soon as possible, perhaps within 10 years. Each reduction in dry-weather discharges will reduce the transport mechanism that carries trash, bacteria, and MBAS downstream. Furthermore, as the dry-weather discharges approach zero, the algal mat will be reduced and the diurnal cycling of pH reduced or eliminated. This, in turn, will reduce or eliminate ammonia exceedances.

The LID, green streets, and water capture facilities constructed to address zinc, the wet weather limiting pollutant, will also address other pollutants. LID and green street facilities will reduce the transport mechanism and capture trash and MBAS, as well as bacteria. The regional and sub-regional water capture facilities will involve pre-treatment that will capture trash and other suspended materials. The facilities will also capture dissolved material that will be filtered as the water infiltrates or be removed if the water is treated for surface irrigation.

In addition, trash and Bis(2-ethylhexyl) phthalate (DEHP), a plasticizer associated with and addressed with trash, are partially addressed through street sweeping, which, in addition to keeping sediment out of the storm drain system, also helps keep trash out of the storm drain system. Further, as explained above, DEHP and trash will also be addressed by implementation of the Proposed Trash Amendments that will apply to the Los Cerritos Channel and its tributaries. The Watershed Group believes that through this approach of activities and control measures it will achieve applicable receiving water limitations for Category 2 and Category 3 pollutants.

6.0 Implementation Schedules

Formal implementation of the Los Cerritos Channel WMP will begin upon approval of the final program plan pursuant to Table 9 of Order No. R4-2012-0175. For planning purposes, the Watershed Group is projecting final plan approval by March or April of 2015. The schedule provides for commencing monitoring on July 1, 2015 as starting monitoring part way through a complete monitoring year or missing the first storms of the year would not be productive. The implementation schedule is strongly influenced by TMDL final wet-weather compliance dates and target dates for Category 2 and Category 3 pollutants, the Watershed Group's Water Quality Improvement Strategy, and the need to establish a stable and sustainable stormwater funding source in Los Angeles County to pay for the expensive stormwater capture and stormwater treatment facilities anticipated to be necessary to meet water quality standards in a timely manner.

At this time it is not possible to identify all projects and schedule their implementation. For instance, although the RAA identifies areas for green street construction and assumes a 30% conversion of road length in suitable areas, it will take time to identify and schedule construction of individual green streets projects. The watershed cities are currently working with the Gateway Council of Governments (Gateway COG) to identify future arterial and intersection projects in the COG's Strategic Transportation Plan with potential for installation of green street measures. Even though not all projects can be specified and scheduled at this time, the Permittees, consistent with the Water Quality Improvement Hierarchy shown in Figure 3-1 and the overall Water Quality Improvement Strategy discussed in Section 3, will construct the necessary mix of water capture facilities, green streets, LID projects, and treatment controls in the various sub-basins to supplement the true source control, runoff reduction, and TSS reduction measures to ensure compliance with permit requirements per applicable compliance schedules. The mix of measures will be periodically adjusted through the adaptive management process.

Furthermore, the LACFCD will work with the Watershed Group in its efforts to address source controls; assess, develop, and pursue funding for structural BMPs, and promote the use of water reuse and infiltration. As regional project scopes are further refined, the LACFCD will contribute to the WMP projects on a case-by-case basis, agreed upon with the Watershed Group.

The overall implementation schedule for the Los Cerritos Channel Watershed Management Program is based, in part, on the implementation schedule in the Los Cerritos Channel Metals TMDLs and the Greater Harbor Toxics TMDLs. For other pollutants, the implementation schedules are based on the schedules for TMDLs in other watersheds. Final wet-weather compliance target dates for Category 1, 2, and 3 pollutants are shown in Table 6-1 as well as tables, 2-9, 2-10, 2-11, and 2-12 in Section 2. Interim milestone targets occurring between July 1, 2014 and December 28, 2022 are shown in Table 6-2.

Table 6-1: Final Compliance Dates for Category 1, 2, and 3 Pollutants

Date	Target
September 2025	Target compliance date for trash and Bis(2-ethylhexyl)phthalate and MBAS

September 2026	Final compliance date for LCC Metals TMDLs
March 2032	Final compliance date for Harbor Toxics TMDL
September 2040	Target compliance date for bacteria

Table 6-2: Interim Milestone Targets Between December 28, 2012 and December 28, 2017*

Date	Target
September 30, 2016	10% of the Watershed meeting Basin Plan standard of 0.5 mg/L for MBAS
September 30, 2016	Installation of full-capture trash control devices serving 10% of the high priority land uses in the watershed to address trash and Bis(2-ethylhexyl)phthalate**
March 23, 2017	Greater Harbor Responsible Parties complete Phase I of Implementation Plan and Sediment Management Plan
September 30, 2017	For the LCC Metals TMDLs, 30% of the drainage area served by storm drain system effectively meeting dry-weather WLAs and 10% of drainage area served by storm drain system meeting wet-weather WLAs or equivalent redirections in total loads at Stearns Street monitoring site.
September 30, 2017	Installation of full-capture trash control devices serving 20% of the high priority land uses in the watershed to address trash and Bis(2-ethylhexyl)phthalate**
September 30, 2017	20% of the watershed meeting Basin Plan standard of 0.5 mg/l for MBAS

* Additional milestone information in Tables 6-4 through 6-11.

** Assuming adoption of proposed Trash Amendments in Spring 2015.

Part VI.C.5.c provides guidance for inclusion of implementation schedules into the WMP. Compliance schedules for TMDLs are to be incorporated into the program schedule. Compliance schedules and interim milestone dates are to be used to measure progress toward addressing the highest water quality priorities and achieving applicable water quality-based effluent limitations. Schedules must be adequate to measure progress on a watershed scale every two years as part of an adaptive management process. Schedules are to be developed for the strategies, control measures, and BMPs to be implemented by each Permittee within its jurisdiction and for those that will be implemented by multiple Permittees on a watershed scale. The current schedule focuses on regional projects to be implemented on a watershed scale and on municipal roles in planning and implementing these projects. Schedules for jurisdictional projects will be added to the schedules during adaptive management review as cities plan and program implementation of green streets, LID, and other local projects. Several of the measures in the

Implementation Schedule include encouraging actions by other entities. Depending on the measure, this encouragement will be done through outreach efforts and/or implementation of inspection programs.

The initial schedule contained in this WMP covers a 26-year period and is structured into eight three-year phases and a two-year phase. These schedules assume a 2015 start date and are based on an anticipated 5-year permit renewal cycle. Table 3 is an implementation summary for the period 2015 through 2040. The table summarizes information for Phases 1-4 (2015-2026) and a schedule for planning Phases 5-9 (2027-2040). It shows the interim milestone and final compliance dates for the metals TMDLs as well as anticipated interim milestone and final compliance dates for the State Water Board's trash amendments. At this time it contains only one compliance date for the Greater Harbor Toxics TMDL. The Watershed Group will review data from the Greater Harbor Regional Monitoring Coalition monitoring of East San Pedro Bay during the first two adaptive management reviews to develop a schedule, if needed, for measures to address Greater Harbor Toxics TMDL pollutants not already addressed.

Table 6-3
Summary WMP Implementation and Milestone Schedule[1]

2015-2017 Phase 1 (See Tables 6-4, 6-5, and 6-12 for schedules, milestones, and sub-basin implementation measures)[2]

Q2, 2015 – Anticipated Adoption of Trash Amendment

Q3, 2015 – Anticipated Effective Date of Trash Amendment

September 30, 2016 –Anticipated Interim Trash Amendment Milestone

September 30, 2016 – Interim MBAS Milestone

March 23, 2017 – Completion of Phase I of Implementation Plan and Sediment Management Plan for Greater Harbor Toxics TMDL

July 1, 2017 – Report of Waste Discharge (ROWD) Due

September 30, 2017 –Anticipated Interim Trash Amendment Milestone

September 30, 2017 – Interim Metals TMDL Milestone

September 30, 2017 – Interim MBAS Milestone

2018-2020 Phase 2 (See Tables 6-6, 6-7, and 6-12 for schedules, milestones, and sub-basin implementation measures)[1, 2]

September 30, 2018 – Anticipated Interim Trash Amendment Milestone

September 30, 2018 – Interim MBAS Milestone

September 30, 2019 – Anticipated Interim Trash Amendment Milestone

September 30, 2019 – Interim MBAS Milestone

September 30, 2020 – Anticipated Interim Trash Amendment Milestone

September 30, 2020 – Interim MBAS Milestone

September 30, 2020 – Interim Metals TMDL Milestone

2021-2023 Phase 3 (See Tables 6-8, 6-9, and 6-12 for schedules, milestones, and implementation measures)[3]

September 30, 2021 – Anticipated Interim Trash Amendment Milestone

September 30, 2021 – Interim MBAS Milestone

[1] Schedule based on 5-year permit renewal schedule
[2] Phases 1 and 2 are detailed as action plans subject to availability of funds for design and construction of green streets and stormwater capture devices.
[3] Phase 3 will be converted to an action plan as part of a 2017 Report of Waste Discharge (ROWD).

July 2022 – Anticipated ROWD Due Date

September 30, 2022 – Anticipated Interim Trash Amendment Milestone

September 30, 2022 – Interim MBAS Milestone

September 30, 2023 – Anticipated Interim Trash Amendment Milestone

September 30, 2023 – Interim Metals TMDLs Milestone

September 30, 2023 – Interim MBAS Milestone

2024-2026 Phase 4 (See Tables 6-10, 6-11, and 6-12 for schedules, milestones, and implementation measures)[4]

September 30, 2024 – Anticipated Interim Trash Amendment Milestone

September 30, 2024 – Interim MBAS Milestone

September 30, 2025 – Anticipated Interim Trash Amendment Final Compliance Date

September 30, 2025 – Final MBAS Compliance Target Date

July 2026 – Anticipated ROWD Due Date

September 30, 2026 – Final Metals TMDLs Compliance Date

2027-2029 Phase 5 (To Be Planned During Phase 3)[5]

2030–2032 Phase 6 (To Be Planned During Phase 4)[6]

2033-2035 Phase 7 (To Be Planned During Phase 5)[7]

2036-2038 Phase 8 (To Be Planned in Phase 6)[8]

2039-2040 Phase 9 (To Be Planned in Phase 7)[9]

Tables 6-4 through 6-11 provide more information about activities during phases 1-4 (2015-2026). They demonstrate the progressive implementation of the WMP, beginning with planning and ordinance development and moving to design and construction, subject to the availability of funding. The schedule for phases 2-4 will be reviewed and refined during the first adaptive management review.

[4] Phase 4 will be converted to an action plan as part of the expected 2022 ROWD.
[5] Phase 5 will be converted to an action plan as part of the expected 2022 ROWD.
[6] Phase 6 will be converted to an action plan as part of the expected 2027 ROWD.
[7] Phase 7 will be converted to an action plan as part of the expected 2032 ROWD.
[8] Phase 8 will be converted to an action plan as part of the expected 2032 ROWD.
[9] Phase 9 will be converted to an action plan as part of the expected 2037 ROWD.

Table 6-4
WMP Implementation Schedule – Ongoing Measures
Phase 1 (2015-2017)

Minimum Control Measures

- Public Information and Participation Program
- Industrial/Commercial Facilities Control Program[1]
- Development of Planning Program
- Development of Controls Program
- Public Agencies Activities Program
- Illicit Connection and Illicit Discharge Elimination Program
- Preparation of a targeted industrial inspection component for metals by City of Paramount

True Source Control and Operational Source Control[1]
(Emphasis on Category 1 pollutants)

- Implementation of SB 346
- Implementation of SB 757
- Support development and Implementation of Safer Consumer Products Regulations
- Monitoring of USEPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline
- Monitoring of California Product Stewardship Council Proposals, especially for Extended Producer Responsibility and other true source control measures
- Outreach to industries potentially contributing zinc to Watershed by all municipalities to encourage control of non-industrial process source of zinc.

TSS Reduction (Soil Stabilization/Sediment Control)[1]

- Implementation of model TSS reduction ordinance(s) by City of Signal Hill (2016-2017)
- Enhanced erosion and sediment control at construction sites
- Stabilization of exposed soil not associated with construction sites
- Enhanced street sweeping.

Runoff Reduction and Stormwater Capture[1]

- Jurisdictional planning for green streets Support State legislation to resolve liability issues raised by school administrators in order to facilitate construction of water capture facilities under school athletic fields and playgrounds (2015-2016)
- Encourage Cities and water purveyors to work together to implement stormwater capture and use or infiltration facilities consistent with AB 2403Encourage the use of permeable pavements in parking lots
- Encourage the use of cisterns and rain barrels to reduce the discharge of roof stormwater runoff

[1] Refer to Table 6-12 for implementation by sub-basin.

Trash Reduction and Control[1]

- Watershed Group coordination with California Product Stewardship Council to reduce trash through reduction of packing materials and implementation of take-back programs
- Research regarding grant opportunities by Watershed Group to pay for installation of full capture systems for high priority land use areas

Stormwater Financing

- Encourage California Contract Cities and League of California Cities, Los Angeles County Division to organize as recommended in the Stormwater Funding Options report to secure sustainable water quality funding in Los Angeles County.
- Improve public education and outreach by Watershed Cities to inform residents, businesses, and others about stormwater program requirements and funding issues.
- Encourage State legislature to adopt a "per tire" zinc control fee with monies made available to local government to construct stormwater capture and/or treatment control facilities to reduce the discharge of zinc to receiving waters
- Encourage inclusion of more money for stormwater quality management in future State water bonds and transportation bond measures
- Encourage Cities to support adoption of a regional stormwater fee

Priority Sub-basin Targets[2]

Targets	Acreage[3]	% LCC Watershed[3]
Sub-basin 4	2,270.6	12.80
Sub-basin 8	2,711.8	15.30
Sub-basin 10	3,403.1	19.20
		47.30

[2] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.

[3] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-5
WMP Implementation Schedule – Measures with Interim Milestones
Phase 1 (2015-2017)

TSS Reduction (Soil Stabilization/Sediment Control)

- Adoption of model TSS reduction ordinances by City of Signal Hill (December 31, 2015)
- Consideration of possible adoption of TSS reduction ordinances by other Cities within the Watershed (December 31, 2016)
- Consideration and possible adoption of parking lot sweeping ordinances by Cities within Watershed (December 31, 2016)

Runoff Reduction and Stormwater Capture

- Development of prototype design of biofiltration and infiltration chamber for streets with wider parkways by City of Lakewood (September 30, 2015)
- Development of prototype design of biofiltration and infiltration chamber for streets with narrow parkways by City of Paramount (December 31, 2015)
- Development of concept plan for stormwater capture project at Mayfair Park by Cities of Lakewood and Bellflower (June 30, 2016)
- Development of concept plan for stormwater project at Skylinks Golf Course by Cities of Long Beach and Signal Hill (December 31, 2015)
- Development of a process for allocating costs to design and construct regional stormwater capture projects (December 31, 2015)
- Construction of low flow diversion to infiltration/evapotranspiration facility or sanitary sewers for one headwater outfall (September 30, 2016)
- Construction of low flow diversion to infiltration/evapotranspiration facility or sanitary sewer for one headwater outfall (September 30, 2017)
- Construction of initial stormwater capture facility, as needed to achieve volume reduction milestones (September 30, 2017)

Trash Reduction and Control[1]

- Inventory by Cities in Watershed of catch basins in high priority land use areas pursuant to Trash Amendments adopted by State Water Board (March 31, 2016)[1]
- Installation of full capture systems by Cities in 10% of catch basins serving high priority land use areas within the Watershed portions of each City, subject to the availability of funding (September 30, 2016)[1]
- Installation of full capture systems by Cities in 20% of catch basins serving high priority land use areas within the Watershed portions of each City, subject to the availability of funding (September 30, 2017)[1]

[1] Presuming adoption of trash amendments by State Water Board in spring of 2015.

Treatment Control

- Installation of two tree box filters by the City of Downey, funded partially through a Proposition 84 grant received by the Gateway Water Management Agency (September 30, 2016)
- Installation of two tree box filters by City of Signal Hill, partially funded by a Proposition 84 grant received by the Gateway Water Management Agency (September 30, 2016)

Priority Sub-basin Targets[1]

Targets	Acreage[2]	% LCC Watershed[3]
Sub-basin 4	2,270.6	12.80
Sub-basin 8	2,711.8	15.30
Sub-basin 10	3,403.1	19.20
		47.30

[1] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.

[2] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-6
WMP Implementation Schedule – Ongoing Measures
Phase 2 (2018-2020)

Minimum Control Measures

- Public Information and Participation Program
- Industrial/Commercial Facilities Control Program[1]
- Development Planning Program
- Development Controls Program
- Public Agencies Activities Program
- Illicit Connection and Illicit Discharge Elimination Program

True Source Control and Operational Source Control[2]
(Emphasis on Category 1 pollutants)

- Implementation of SB 346
- Implementation of SB 757
- Implementation of Safer Consumer Products Regulations to reduce zinc in tires
- Monitoring of USEPA Rulemaking to further reduce or remove lead from aviation gasoline
- Monitoring of California Product Stewardship Council Proposals, especially for Extended Producer Responsibility and other true source control measures
- Outreach to industries potentially contributing zinc to Watershed by all municipalities to encourage control of non-industrial process source of zinc.
- Outreach to restaurants and markets to encourage control of potential sources of bacteria
- Outreach to pet owners to clean up after their pets to reduce sources of bacteria

TSS Reduction (Soil Stabilization/Sediment Control)[2]

- Implementation of adopted TSS reduction ordinance(s) by Cities in Watershed
- Implementation of adopted parking lot sweeping ordinances by Cities in Watershed
- Implementation of agreements with utilities
- Enhanced erosion and sediment control at construction sites
- Stabilization of exposed soil not associated with construction sites
- Enhanced street sweeping
- Enhanced parking lot sweeping

Runoff Reduction and Stormwater Capture[2]

- Jurisdictional planning for green streets
- Implementation of biofiltration and infiltration chambers for streets with wider parkways by Cities, subject to availability of funding
- Implementation of biofiltration and infiltration chambers for streets with narrow parkways by Cities, subject to availability of funding

[1] Initial emphasis on facilities that are probable metals and trash sources.

[2] Refer to Table 6-12 for implementation by sub-basin.

- Encourage Cities and water purveyors to work together to implement stormwater capture and use or infiltration facilities consistent with AB 2403
- Encourage the use of permeable pavements in parking lots
- Encourage the use of cisterns and rain barrels to reduce the discharge of roof stormwater runoff

Trash Reduction and Control

- Watershed Group coordination with California Product Stewardship Council to reduce trash through reduction of packing materials and implementation of take-back programs
- Research regarding grant opportunities by Watershed Group to pay for full capture devices for catch basins in high priority land use areas

Stormwater Financing

- To Be Determined

Priority Subbasin Targets[3]

Targets	Acreage[4]	% LCC Watershed
Sub-basin 4	2,270.6	12.80
Sub-basin 7	1,359.7	7.68
Sub-basin 8	2,711.8	15.30
Sub-basin 9	3,709.3	20.90
Sub-basin 10	3,403.1	19.20
		65.88

[3] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub basins during this phase.
[4] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-7
WMP Implementation Schedule – Measures with Interim Milestones
Phase 2 (2018-2020)

Runoff Reduction and Stormwater Capture[2]

- Implementation of stormwater capture project at Mayfair Park by Cities of Lakewood and Bellflower, as needed to achieve volume reduction milestones (September 30, 2019)
- Implementation of stormwater project at Skylinks Golf Course by Cities of Long Beach and Signal Hill, as needed to achieve volume reduction milestones (September 30, 2019)
- Development of concept plan for stormwater capture device at Caruthers Park by the City of Bellflower (December 31, 2018)
- Development of concept plan for stormwater capture at Heartwell Park (Clark Channel) by Long Beach, Bellflower, Lakewood, and Paramount (September 30, 2020)
- Development of concept plan for stormwater capture at Heartwell Park (Palo Verde Channel) by Cities of Bellflower, Lakewood (June 30, 2018)
- Development of concept plan for stormwater capture at Skylinks Golf Course by Cities of Long Beach and Lakewood (June 30, 2018)

Trash Reduction and Control

- Installation of full capture systems by Cities in 30% of catch basins serving high priority land use areas within the Watershed portions of each City, subject to the availability of funding (September 30, 2018)
- Installation of full capture systems by Cities in 40% of catch basins serving high priority land use areas within the Watershed portions of each City, subject to the availability of funding (September 30, 2019)[1]
- Installation of full capture systems by Cities in 50% of catch basins serving high priority land use areas within the Watershed portions of each City, subject to the availability of funding (September 30, 2020)[2]

	Priority Sub-basin Targets[2]	
Targets	Acreage[3]	% LCC Watershed[3]
Sub-basin 4	2,270.6	12.80
Sub-basin 7	1,359.7	7.68
Sub-basin 8	2,711.8	15.30
Sub-basin 9	3,709.3	20.90
Sub-basin 10	3,403.1	19.20
		65.88

[1] Presuming adoption of trash amendments by State Water Board in Spring 2015
[2] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.
[3] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-8
WMP Implementation Schedule – Ongoing Measures
Phase 3 (2021-2023) Tentative Plan

Minimum Control Measures

- Public Information and Participation Program
- Industrial/Commercial Facilities Control Program[1]
- Development Planning Program
- Development Controls Program
- Public Agencies Activities Program
- Illicit Connection and Illicit Discharge Elimination Program

True Source Control and Operational Source Control[2]
(Emphasis on Category 1 pollutants)

- Implementation of SB 346
- Implementation of SB 757
- Implementation of Safer Consumer Products Regulations to reduce zinc in tires
- Monitoring of USEPA Rulemaking to further reduce or remove lead from aviation gasoline
- Monitoring of California Product Stewardship Council Proposals, especially for Extended Producer Responsibility and other true source control measures
- Outreach to industries potentially contributing zinc to Watershed by all municipalities to encourage control of non-industrial process source of zinc.
- Outreach to restaurants and markets to encourage control of potential sources of bacteria
- Outreach to pet owners to clean up after their pets to reduce sources of bacteria

TSS Reduction (Soil Stabilization/Sediment Control)[2]

- Implementation of adopted TSS reduction ordinance(s) by Cities in Watershed
- Implementation of adopted parking lot sweeping ordinances by Cities in Watershed
- Implementation of agreements with utilities
- Enhanced erosion and sediment control at construction sites
- Stabilization of exposed soil not associated with construction sites
- Enhanced street sweeping
- Enhanced parking lot sweeping

Runoff Reduction and Stormwater Capture[2]

- Jurisdictional planning for green streets
- Implementation of biofiltration and infiltration chambers for streets with wider parkways by Cities, subject to availability of funding
- Implementation of biofiltration and infiltration chambers for streets with narrow parkways by Cities, subject to availability of funding

[1] Initial emphasis on facilities that are probable metals and trash sources.
[2] Refer to Table 6-12 for implementation by sub-basin.

- Encourage Cities and water purveyors to work together to implement stormwater capture and use or infiltration facilities consistent with AB 2403
- Encourage the use of permeable pavements in parking lots
- Encourage the use of cisterns and rain barrels to reduce the discharge of roof stormwater runoff

Trash Reduction and Control

- Watershed Group coordination with California Product Stewardship Council to reduce trash through reduction of packing materials and implementation of take-back programs
- Research regarding grant opportunities by Watershed Group to pay for installation of full capture systems for catch basins in high priority land use areas

Stormwater Financing

- To Be Determined

Priority Sub-basin Targets[3]

Targets	Acreage[4]	% LCC Watershed
Sub-basin 5	331.6	1.87
Sub-basin 6	1,663.7	9.39
Sub-basin 7	1,359.7	7.68
Sub-basin 9	3,709.3	20.90
		39.84

[3] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.

[4] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-9
WMP Implementation Schedule –Measures with Interim Milestones
Phase 3 (2021-2023) Tentative Plan

Runoff Reduction and Stormwater Capture

- Implementation of stormwater capture project at Heartwell Park (Clark Channel) by Cities of Long Beach, Bellflower, Lakewood, and Paramount, subject to availability of funding (Q3, 2021)
- Implementation of stormwater project at Heartwell Park (Palo Verde Channel) by Cities of Bellflower and Lakewood, subject to availability of funding (Q3, 2021)
- Implementation of stormwater capture device at Caruthers Park by City of Bellflower, subject to availability of funding (Q3, 2022)
- Development of concept plan for stormwater capture at Reservoir Park by City of Signal Hill (Q2, 2022)
- Development of concept plan for stormwater capture at Progress Park by City of Paramount (Q2, 2022)
- Development of concept plan for stormwater capture at Wardlow Park by City of Long Beach (Q3, 2023)

Trash Reduction and Control

- Installation of full capture systems by Cities in 60% of catch basins serving high priority land use areas within the Watershed portion of each City, subject to the availability of funding (Q3, 2021)[1]
- Installation of full capture systems by Cities in 70% of catch basins serving high priority land use areas within the Watershed portion of each City, subject to the availability of funding (Q3, 2022)[3]
- Installation of full capture systems by Cities in 80% of catch basins serving high priority land use areas within the Watershed portion of each City, subject to the availability of funding (Q3, 2023)[3]

Stormwater Financing

- To Be Determined

	Priority Sub-basin Targets[2]	
Targets	Acreage[3]	% LCC Watershed
Sub-basin 5	331.6	1.87
Sub-basin 6	1,663.7	9.39
Sub-basin 7	1,359.7	7.68
Sub-basin 9	3,709.3	20.90
		39.84

[1] Presuming adoption of trash amendments by State Water Board in Spring 2015.
[2] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.
[3] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-10
WMP Implementation Schedule – Ongoing Measures
Phase 4 (2024-2026) Tentative Plan

Minimum Control Measures

- Public Information and Participation Program
- Industrial/Commercial Facilities Control Program[1]
- Development Planning Program
- Development Controls Program
- Public Agencies Activities Program
- Illicit Connection and Illicit Discharge Elimination Program

True Source Control and Operational Source Control[2]
(Emphasis on Category 1 pollutants)

- Implementation of SB 346
- Implementation of SB 757
- Implementation of Safer Consumer Products Regulations to reduce zinc in tires
- Implementation of USEPA Rulemaking to further reduce or remove lead from aviation gasoline
- Monitoring of California Product Stewardship Council Proposals, especially for Extended Producer Responsibility and other true source control measures
- Outreach to industries potentially contributing zinc to Watershed by all municipalities to encourage control of non-industrial process source of zinc.
- Outreach to restaurants and markets to encourage control of potential sources of bacteria
- Outreach to pet owners to clean up after their pets to reduce sources of bacteria

TSS Reduction (Soil Stabilization/Sediment Control)[2]

- Implementation of adopted TSS reduction ordinance(s) by Cities in Watershed
- Implementation of adopted parking lot sweeping ordinances by Cities in Watershed
- Implementation of agreements with utilities
- Enhanced erosion and sediment control at construction sites
- Stabilization of exposed soil not associated with construction sites
- Enhanced street sweeping
- Enhanced parking lot sweeping

Runoff Reduction and Stormwater Capture[2]

- Jurisdictional implementation for green streets
- Implementation of biofiltration and infiltration chambers for streets with wider parkways by Cities, subject to availability of funding
- Implementation of biofiltration and infiltration chambers for streets with narrow parkways by Cities, subject to availability of funding
- Encourage Cities and water purveyors to work together to implement stormwater capture and use or infiltration facilities consistent with AB 2403
- Encourage the use of permeable pavements in parking lots

[1] Initial emphasis on facilities that are probable metals and trash sources.
[2] Refer to Table 6-12 for implementation by sub-basin.

- Encourage the use of cisterns and rain barrels to reduce the discharge of roof stormwater runoff

Trash Reduction and Control

- Watershed Group coordination with California Product Stewardship Council to reduce trash through reduction of packing materials and implementation of take-back programs
- Research regarding grant opportunities by Watershed Group to pay for installation of full capture systems for catch basins in high priority land use areas (ongoing)

Stormwater Financing

- To Be Determined

Priority Sub-basin Targets[3]

Targets	Acreage[4]	% LCC Watershed
Sub-basin 1	719.6	4.06
Sub-basin 2	1,241.1	7.00
Sub-basin 3	305.0	1.72
Sub-basin 5	331.6	1.87
Sub-basin 6	1,663.7	9.39
		24.04

[3] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.

[4] Based on EPA TMDL acreages that include Caltrans and County acreages

Table 6-11
WMP Implementation Schedule – Measures with Interim Milestones
Phase 4 (2024-2026) Tentative Plan

Runoff Reduction and Stormwater Capture

- Implementation of stormwater capture device at Reservoir Park by the City of Signal Hill, subject to availability of funding (Q3, 2024)
- Implementation of stormwater capture project at Progress Park by City of Paramount, subject to availability of funding (Q3, 2024)
- Implementation of stormwater capture project at Wardlow Park by City of Long Beach, subject to availability of funding (Q3, 2025)
- Development of concept plan for stormwater capture facility at Sims Park by City of Bellflower (2Q, 2024)
- Development of concept plan for stormwater capture facility at Pan American Park by City of Long Beach (2Q, 2024)
- Development of concept plan for stormwater capture facility at Long Beach Junior Golf Course by City of Long Beach (2Q, 2024)

Trash Reduction and Control

- Installation of full capture systems by Cities in 90% of catch basins serving high priority land use areas within the Watershed portion of each City, subject to the availability of funding (Q3, 2024)[1]
- Installation of full capture systems by Cities in 100% of catch basins serving high priority land use areas within the Watershed portion of each City, subject to the availability of funding (Q3, 2025)[1]

Stormwater Financing

- To Be Determined

	Priority Subbasin Targets[2]	
Targets	Acreage[3]	% LCC Watershed
Sub-basin 1	719.6	4.06
Sub-basin 2	1,241.1	7.00
Sub-basin 3	305.0	1.72
Sub-basin 5	331.6	1.87
Sub-basin 6	1,663.7	9.39
		24.04

[1] Presuming adoption of trash amendments by State Water Board in Spring 2015.

[2] See Figure 1-4 and Attachment B. Special attention given to control measures serving priority sub-basins during this phase.

[3] Based on EPA TMDL acreages that include Caltrans and County acreages.

Table 6-12
Sub-Basin Implementation Measures

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 1 [Phase 4] (2024-2026) Responsible Jurisdiction: Long Beach	719.6 ac (4.06% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs. Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development projects Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure; the City of Long Beach is not currently using regenerative or vacuum sweepers

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 2 [Phase 2] (2024-2026) Responsible Jurisdiction: Long Beach	1,241.1 ac (7% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development projects Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure; the City of Long Beach is not currently using regenerative or vacuum sweepers

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 3 [Phase 4] (2024-2026) Responsible Jurisdiction: Long Beach	305 ac (1.72% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development projects Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure; the City of Long Beach is not currently using regenerative or vacuum sweepers

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 4 [Phases 1 & 2] (2015-2020) Responsible Jurisdictions: Long Beach and Signal Hill	2,270.6 ac (12.8% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs Implementation of Stormwater Capture Project at Skylinks Golf Course (Phase 2)[2] Implementation of Stormwater Capture at Reservoir Park (Delayed until Phase 4)[2]	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances (Phase 2) Implementation of Parking Lot Sweeping Ordinances (Phase 2)	Distributed LID measures associated with development project Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure for part of sub-basin; the City of Long Beach is not currently using regenerative or vacuum sweepers
[2] Subject to availability of funding

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 5 [Phases 3 & 4] (2021-2026) Responsible Jurisdiction: Long Beach	331.6 ac (1.87% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development project Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure; the City of Long Beach is not currently using regenerative or vacuum sweepers

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 6 [Phases 3 & 4] (2021-2026) Responsible Jurisdictions: Lakewood and Long Beach	1,663.7 ac (9.39% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Monitor USEPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline Prepare petition for control of zinc in tires through Safer Consumer Product Regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs Implementation of Stormwater Capture Project at Skylinks Golf Course (Phase 3)[2]	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Develop specifications and requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development projects Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure for part of sub-basin; the City of Long Beach is not currently using regenerative or vacuum sweepers
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Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 7 [Phases 2 & 3] (2018-2023) Responsible Jurisdictions: Lakewood and Long Beach	1,359.7 ac (7.68% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs Implementation of Stormwater Capture Project at Heartwell Park (Phase 3)[2] Implementation of Stormwater Capture Project at Pan American Park (Delayed until Phase 4)[2]	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development project Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure for part of sub-basin; the City of Long Beach is not currently using regeneration or vacuum sweepers
[2] Subject to availability of funding

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 8 [Phases 1 & 2] (2015-2020) Responsible Jurisdictions: Bellflower and Lakewood	2,711.8 ac (15.3% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Monitor USEPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline Prepare petition for control of zinc in tires through Safer Consumer Product Regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs Implementation of Stormwater Capture Project at Mayfair Park (Phase 2)[1]	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Develop specifications and requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances (Phase 2) Implementation of Parking Lot Sweeping Ordinances (Phase 2)	Distributed LID measures associated with development projects Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Subject to availability of funding

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 9 [Phases 2 & 3] (2018-2023) Responsible Jurisdictions: Bellflower, Downey, Long Beach, and Paramount	3,709.3 ac (20.9% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Lead reduction through implementation of EPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline Zinc reduction through implementation of Safer Consumer Product Alternatives regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs Implementation of stormwater capture project at Progress Park (Delayed until Phase 4)[2]	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Implement requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances Implementation of Parking Lot Sweeping Ordinances	Distributed LID measures associated with development project Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure for part of sub-basin; the City of Long Beach is not currently using regenerative or vacuum sweepers
[2] Subject to availability of funding

Target Sub-basin	Acreage	True Source Control BMPs	Runoff Reduction	Operational Source Ctrl BMPs	Sediment Control	Treatment Ctrl BMPs
Sub-basin 10 [Phases 1 & 2] (2015-2020) Responsible Jurisdictions: Bellflower, Cerritos, Lakewood, and Long Beach	3,403.1 ac (19.2% of LCC watershed)	Copper reduction through implementation of SB 346 Lead reduction through implementation of SB 757 Monitor USEPA Proposed Rulemaking to further reduce or remove lead from aviation gasoline Prepare petition for control of zinc in tires through Safer Consumer Product Regulations	Reduction of landscape irrigation runoff through implementation of AB 1881 Seek grants for construction of capture and infiltration/use structural BMPs Promote installation of cisterns and rain barrels Installation of green street measures at key locations Seek grants for LID retrofit projects Promote use of porous pavement & distributed capture and infiltration structural BMPs Implementation of Stormwater Capture Project at Caruthers Park (Phase 2)[2] Implementation of Stormwater Capture Project at Heartwell Park (Delayed until Phase 3)[2]	Outreach to priority industries identified as having high probability of generating copper, lead, or zinc, trucking companies, facilities with large parking lots, and automotive repair facilities to encourage implementation of cover and containment BMPs Promote coating of exposed galvanized metal Develop specifications and requirements for coated galvanized metal for use when exposed	Enhanced street sweeping with vacuum and regenerative sweepers[1] Enhanced erosion and sediment control at construction sites Stabilization of exposed soils not associated with construction sites Implementation of TSS Reduction Ordinances (Phase 2) Implementation of Parking Lot Sweeping Ordinances (Phase 2)	Distributed LID measures associated with development projects Installation of green street measures at key locations Installation of full capture systems in catch basins in high priority land use areas Others to be determined

[1] Potential Measure for part of sub-basin; the City of Long Beach is not currently using regenerative or vacuum sweepers
[2] Subject to availability of funding

7.0 Legal Authority

This section covers information, such as documentation and references/links to water quality ordinances for each participating agency, that demonstrates adequate legal authority to implement and enforce Watershed Control Measures (WCMs) identified in this plan and as required in Section VI.D.5.b.iv.6 of the MS4 Permit. The goal of these WCMs is to create an efficient program that focuses on Watershed priorities by meeting the following objectives:

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

The WCMs include the minimum control measures, non-stormwater discharge measures and targeted control measures (i.e. controls to address TMDL and 303(d) listings). Since the requirement to incorporate these WCMs is an element of the MS4 Permits, the legal authority to implement them results from each agency's legal authority to implement the NPDES MS4 Permit.

Copies of seven participating agencies' legal authority certifications from their respective chief legal counsels can be found in Attachment F. The City of Long Beach's MS4 permit is on a separate timeline and a legal authority letter will be submitted separately. A status report will be included in the Long Beach separate area WMP when submitted. Certifications shall be prepared annually. Table 7-1 includes the section that covers water quality ordinances for each agency with a reference link.

Table 7-1 Water Quality Ordinance Language

City	Water Quality Ordinance	Reference
Bellflower	Title 13 - Public Services, Chapter 13.20, Stormwater and Runoff Pollution Control	http://qcode.us/codes/bellflower
13.20.030 Purpose and Intent (B) - *The intent of this chapter is to enhance and protect the water quality of the receiving waters of the United States in a manner that is consistent with the Clean Water Act and acts amendatory thereof or supplementary thereto, to applicable implementing regulations and the municipal NPDES permit and any amendment, revision, or re-issuance thereof.*		
Cerritos	Title 6 - Health and Sanitation, Chapter 6.32, Stormwater and Urban Runoff Pollution Prevention Controls	http://www.codepublishing.com/ca/cerritos.html
6.32.010 Purpose (C) - *Reducing pollutants in storm water and urban runoff to the maximum extent practicable. (Ord. 777 § 1 (part), 1997)*		
Downey	Article V- Sanitation, Chapter 7, Stormwater and Urban Runoff Pollution and Conveyance Controls	http://qcode.us/codes/downey/

Section 5701. Watershed Management Program - *Notwithstanding other provisions in the Downey Municipal Codes, the MS4 Permit requires the City of Downey to implement the Watershed Management Program (WMP), and any subsequent amendments, are hereby incorporated into this Ordinance by reference. (Added by Ord. 1142, adopted 02-11-03; amended by Ord. 1320, adopted 11-12-13).*		
Lakewood	Article 05 (V) - Sanitation-Health, Chapter 8, Stormwater and Urban Runoff Pollution Control	http://weblink.lakewoodcity.org/weblink8/
5800 - Adoption of the Los Angeles County Stormwater Runoff Pollution Control Ordinance - *Except as otherwise provided in this Chapter, the stormwater runoff pollution control ordinance of the County of Los Angeles contained in Chapter 12.80 of Title 12 - Environmental Protection of the Los Angeles County Code relating to control of pollutants carried by stormwater and runoff adopted by the County of Los Angeles on June 9, 1998, is hereby adopted and made a part hereof as though set forth in full. The same shall hereafter constitute the Stormwater and Runoff Pollution Control Ordinance of the City of Lakewood relating to the control of pollutants carried by stormwater and runoff and discharging into receiving water of the United States.*		
Long Beach	Volume II-Title 18-Building and Construction, Chapter 18.61, NPDES and SUSMP Regulations	http://library.municode.com/index.aspx?clientId=16115
18.61.010 Purpose - *The purpose of this chapter is to provide regulations and give legal effect to certain requirements of the National Pollutant Discharge Elimination System (NPDES) permit issued to the City of Long Beach, and the subsequent requirements of the Standard Urban Storm Water Mitigation Plan (SUSMP), mandated by the California Regional Water Quality Control Board, Los Angeles Region (RWQCB). The intent of these regulations is to effectively prohibit non-storm water discharges into the storm drain systems or receiving waters and to require source control BMPs to prevent or reduce the discharge of pollutants into storm water to the maximum extent practicable.*		
Paramount	Chapter 48 - Urban Stormwater Management	http://www.paramountcity.com/code.cfm?task=detail2&ID=20
Sec. 48-2.1. Purpose and intent - *The purpose of this chapter is to protect the health and safety of the residents of the city by protecting the beneficial uses of receiving waters within the city from pollutants carried by storm water and non-storm water discharges. The intent of this chapter is to enhance and protect the water quality of the receiving waters of the city and the United States, consistent with the Act. (Ord. No. 892)* Sec. 48-2.2. Applicability of this chapter - *The provisions of this chapter shall apply to the discharge, deposit or disposal of any storm water and/or runoff to the storm drain system and/or receiving waters within any incorporated area covered by a NPDES municipal storm water permit. (Ord. No. 892)*		
Signal Hill	Chapter 12.16- Stormwater/ Urban Runoff	http://www.amlegal.com/library/ca/signalhill.shtml
12.16.020 Purpose and Intent - *The purpose of this chapter is to protect the public health, welfare and safety and to reduce the quantity of pollutants being discharged to the waters of the United States through: (D) The protection and enhancement of the quality of the waters of the United States in a manner consistent with the provisions of the Clean Water Act;*		
LACFCD	Flood Control District Code, Chapter 21 - Stormwater and Runoff Pollution Control	https://library.municode.com/index.aspx?clientId=16274
21.01 - Purpose and Intent - *The purpose and intent of this chapter is to regulate the stormwater and non-stormwater discharges to the facilities of the Los Angeles County Flood Control District for the protection of those facilities, the water quality of the waters in and downstream of those facilities, and the quality of the water that is being stored in water-bearing zones underground.*		

8.0 Los Cerritos Channel Watershed Reasonable Assurance Analysis (RAA)

A key element of the WMP is the Reasonable Assurance Analysis (RAA), which is used to demonstrate "that the activities and control measures…will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term" (NPDES Permit Order No. R4-2012-0175, Section C.5.b.iv.(5); NPDES Permit Order No. R4-2014-0024, Section C.5.h.vii.(2)). Attachment A presents the revised RAA for the Los Cerritos Channel Watershed. While the Permits prescribe the RAA as a quantitative demonstration that control measures will be effective, the RAA also promotes a modeling process to identify and prioritize potential control measures to be implemented by the WMP. In other words, the RAA not only demonstrates the cumulative effectiveness of BMPs to be implemented, it also supports their selection. Furthermore, the RAA incorporates the applicable compliance dates and milestones for attainment of the WQBELs and RWLs, and therefore supports BMP scheduling.

The Watershed Management Modeling System (WMMS) was used to develop this RAA. WMMS is specified in the Permits as an optional tool to conduct the RAA. The Los Angeles County Flood Control District (LACFCD), through a joint effort with U.S. Environmental Protection Agency (USEPA), developed the WMMS specifically to support informed decisions associated with managing stormwater. The ultimate goal of the WMMS is to identify cost-effective water quality improvement projects through an integrated, watershed-based approach.

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

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

The RAA notes that flow monitoring data for the Los Cerritos Channel is required in order to evaluate simulated flow conditions against observed data. This data will be used to better characterize non-

stormwater flow volumes to demonstrate that proposed volume retention BMPs will capture non-stormwater that would otherwise be discharged through the MS4 in the watershed Area.

Although it is impossible to guarantee a 100% capture of non-stormwater because of the possibility of an accident or the discharge of fire fighting discharges near the bottom of the Watershed, as explained elsewhere in this WMP, the current average dry-weather flows at Stearns Street are less than 0.5 cfs, and the Watershed Group is proposing to eliminate dry-weather flows. A current Proposition 84 project in the Watershed has discovered that periodic higher volume discharges do occur. These are being investigated, and it may be that they are permitted discharges that would not be subject to the non-stormwater discharge prohibitions. In any case, the Watershed Group is committed to monitor dry-weather flows to the extent practicable to provide data for a possible model recalibration during an adaptive management process.

The RAA for the Los Cerritos Channel Watershed is included in Attachment A.

9.0 Coordinated Integrated Monitoring Program (CIMP)

The option of preparing a Coordinated Integrated Monitoring Program (CIMP) is provided in Attachment E of Order No. R4-2012-0175 and Attachment E of Order No. R4-2014-0024.

A Coordinated Integrated Monitoring Program (CIMP) is required to be submitted either separately or as part of a Watershed Management Plan (WMP). The CIMP is required to integrate requirements of the current Los Angeles County MS4 Permit, the City of Long Beach MS4 Permit, and TMDL monitoring requirements. This plan was developed to address five primary objects that include:

- Assess the chemical, physical, and biological impacts of discharges from the MS4s on receiving waters
- Assess compliance with receiving water limitations water limitations and water quality-based effluent limitations (WQBELs) established to implement TMDL wet and dry weather load allocations
- Characterize pollutant loads in MS4 discharges
- Identify sources of pollutants in MS4 discharges
- Measure and improve the effectiveness of pollutant controls implemented under the new MS4 permits.

The approach presented in the CIMP for the Los Cerritos Channel Watershed incorporates all objectives of the Attachment E Monitoring and Reporting Program (MRP) but provides a customized approach to address the objectives identified in the MRP for Stormwater Outfall Monitoring based upon the unique characteristics of the Los Cerritos Channel Watershed. Unlike other Watershed Management Groups (WMGs) in Los Angeles County, the LCC Watershed does not receive flow from other WMGs. External contributions of contaminants are limited to atmospheric deposition originating predominantly from major transportation corridors and facilities.

To facilitate review by the Regional Water Board, the CIMP for the Los Cerritos Channel Watershed has been prepared as a separate document and will be submitted separately. It addresses the MRP objectives related to:

- Receiving Water Monitoring
- Stormwater Outfall Monitoring
- Non-stormwater Outfall-Based Monitoring
- New Development/Redevelopment Effectiveness Training
- Regional Studies

Section 10.0 Adaptive Management Process

10.1 Summary of Considerations for Adaptive Management Review

The adaptive management process is a critical component of the WMP; it makes the program much more than a static plan that could soon become outdated. "Adaptive Management" is another name for what the National Research Council (NRC) called "Adaptive Implementation" in its 2001 report entitled Assessing the TMDL Approach to Water Quality Management. The Council defined adaptive implementation as "a cyclical process in which TMDL plans are periodically assessed for their achievement of water quality standards including designated uses." The Council stated that, "if the implementation of the plan is not achieving the designated uses, scientific data and information should be used to revise the plan." The process envisioned by the National Research Council is presented in Figure 10-1.

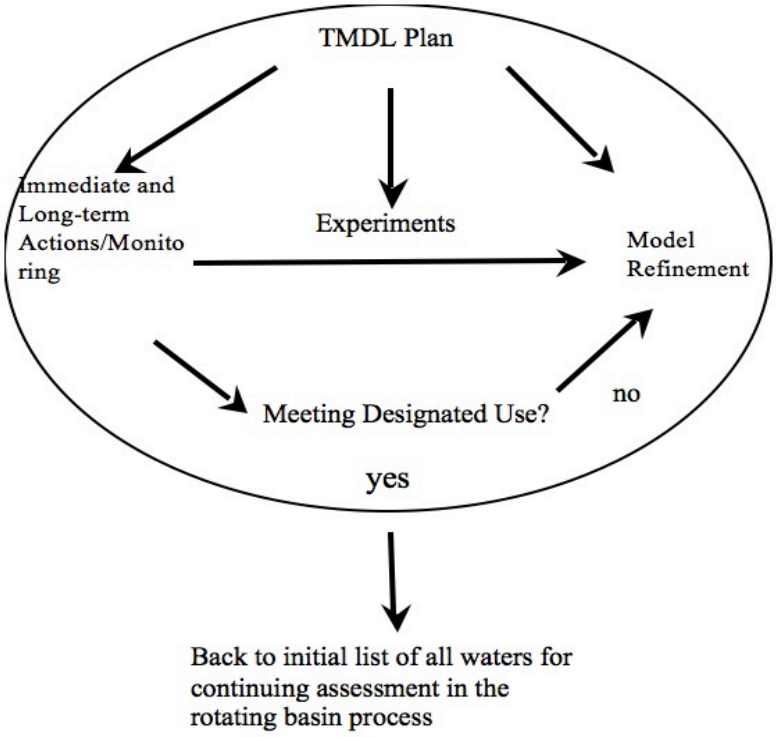

FIGURE 10-1. NRC Adaptive Implementation Flowchart
(Source: National Resource Council, *Assessing the TMDL Approach to Water Quality Management*, 2001.)

The adaptive management process mandated by Order No. R4-2012-0175 extends the concept beyond TMDLs. It also includes all 303(d) listings of impairment and other exceedances of water quality standards (See Section 2 of this WMP).

In developing the adaptive management component of this WMP, the Watershed Group has leaned heavily on the thoughtful analysis of adaptive implementation by the Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction that was assembled by the NRC to prepare its 2001 report. The Committee suggested that the adaptive implementation process should begin with initial actions that have a high degree of certainty and that future actions be based on 1) continued monitoring to determine how a waterbody responds to actions taken, and 2) carefully designed experiments in the watershed. The Committee appropriately referred to this approach as "a concurrent process of action and learning." The NRC Committee suggested a mix of actions, including immediate actions and an array of possible long-term actions. The Committee recognized that regardless of what immediate actions were taken, there may not be an immediate response in waterbody or biological conditions due to lag times between actions and responses – especially when pollutants are tightly bound to sediments. The Committee suggested that waterbodies be monitored to establish the trajectory of measured water quality criteria. The Committee described longer-term actions as those that show promise, but need further evaluation and development. Given the absence of dedicated revenue streams for funding stormwater quality projects within the watershed, the Watershed Group believes that developing funding sources for implementing longer-term actions is vital. The projected costs are much too great to be funded out of municipal General Fund budgets without adversely impacting other municipal programs.

The NRC Committee envisioned "success monitoring" following implementation action, such that if monitoring indicated a waterbody was meeting water quality standards, no further implementation actions would be taken and the waterbody would be returned to an "all waters" list where it would be monitored as part of a rotating basin process. The Committee also suggested that one of the most important applications of success monitoring data is to revise and improve the initial TMDL forecast over time. This concept is consistent with the application of TMDL reopeners to modify TMDLs based on new data and improved understanding of the underlying science. Stormwater is highly variable and episodic, leading to greater uncertainty in stormwater modeling. Over time this uncertainty can be reduced as monitoring data is gathered and physical, chemical, and biological processes are better understood.

10.2 Process for Modifications to Watershed Management Program Resulting from Adaptive Management Review

Section VI.C.8.a I of Order No. R4-2012-0175 requires that Permittees implement an adaptive management process, every two years from the date of program approval, adapting the Watershed Management Program to become more effective based on several factors. This process fulfills the requirement in Part V.A.4 of the Order to address continuing exceedances of receiving water limitations.

The three key factors cited in the permit for consideration during the adaptive management process are the following compliance-related factors:

1) Progress toward achieving interim and/or final water quality-based effluent limitations and/or receiving water limitations in Part VI.E. and Attachments L through R, according to compliance schedules;

2) Progress toward achieving improved water quality in MS4 discharges and achieving receiving water limitations through implementation of the watershed control measures based on an evaluation of outfall-based monitoring data and receiving water monitoring data;

3) Achievement of interim milestones.

The Order also specifies four process-oriented factors that may be considered during the Adaptive Management Process, including:

1) Re-evaluation of the water quality priorities identified for the WMA based on more recent water quality data for discharges from the MS4 and the receiving water(s) and a reassessment of sources of pollutants in MS4 discharges;

2) Availability of new information and data from sources other than the Permittees' monitoring program(s) and a reassessment of sources of pollutants in MS4 discharges;

3) Regional Water Board recommendations; and

4) Recommendations for modifications in the Watershed Management Program solicited through a public participation process.

In addition, the Order indicates that the adaptive process is not limited to the enumerated factors. Any other relevant factors may also be considered.

10.3 Los Cerritos Channel Adaptive Management Process

The adaptive management process for the Los Cerritos Channel Watershed is based on the experience of the municipalities and Caltrans working together to address the Los Cerritos Channel Metals TMDLs first proposed by USEPA in November 2008 and the working relationship established among the Permittees in the years since. In reality, the bi-annual process that will result in submission of an adaptive management report to the Regional Water Board every two years after approval of the WMP will be a continuous process.

Data from the receiving monitoring, watershed segmentation, and forensic monitoring components of the customized Coordinated Integrated Monitoring Program – as well as documentation of soil stabilization and sediment control and documentation of runoff reduction – will provide the critical basis for implementation of the adaptive management process during this permit cycle. Additional critical information will come from implementation of SB 346, development and implementation of zinc source control measures, implementation of Low Impact Development Ordinances and Green Streets Policies, documentation of trash control measures, documentation of runoff reduction measures, documentation of outreach programs, assessment of street sweeping effectiveness, and implementation of local and sub-watershed treatment control measures.

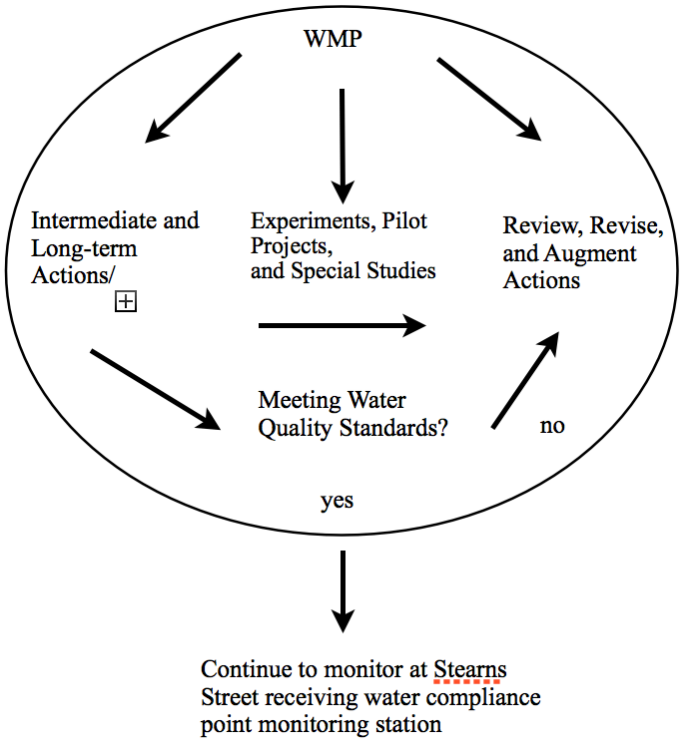

Figure 10-2. Los Cerritos Watershed Management Program Adaptive Management Flowchart

In addition to the three compliance-related factors and the four process-oriented factors specified in Order No. R4-2012-0175, the Los Cerritos Channel Adaptive Management process will include evaluation of key assumptions, immediate and possible long-term actions, updates of maps and databases, and a discussion of stormwater funding measures. These factors include:

1) Evaluation of Immediate Actions, including:
   a) Minimum Control Measures implementation
   b) TSS Reduction Program implementation
   c) Dry-Weather Runoff Reduction Program implementation
   d) Proposition 84 Los Cerritos Channel Watershed Segmentation and LID Planning Project
   e) Targeted Enhanced Street Sweeping Program implementation
   f) Local No or Low Copper Brake Pad Education Program implementation
   g) Local No or Low Copper Pool Algaecide Education Program implementation
   h) Agreements for Locations of Initial Water Capture Devices
   i) Preliminary Design of Initial Capture Devices
   j) Safer Consumer Product Regulations support efforts
   k) EPA's Airport Lead Monitoring Study and FAA's Unleaded Avgas Transition Plan monitoring
   l) Monitoring of Greater Harbor Toxics TMDLs Regional Monitoring Coalition
   m) Water Control Policy for Developing California's Clean Water Act Section 303(d) List implementation monitoring
   n) Funding measure development monitoring
   o) Status of grant funding for stormwater capture projects

2) Evaluation or Re-evaluation of Long-Term Actions, including:
   a) Minimum control measures and other applicable immediate actions
   b) Low Impact Development Ordinances
   c) Green Streets Policies
   d) Full-capture trash control devices implementation
   e) Targeted installation of porous pavement
   f) Development and implementation of measures to reduce the release of zinc from municipal facilities and operations

3) Evaluation of Possible Long-Term Actions, including:
   a) Stormwater Capture and Infiltration Program implementation
   b) Stormwater Capture and Use Program implementation
   c) Additional dry-weather flow and targeted constituent monitoring with associated forensic monitoring (extension of Prop 84 project)

d) Sand filter installation
e) Efforts to encourage the use of coated galvanized metal for exterior applications

4) Updating and refinement of storm drain, channel, and outfall mapping

5) Updating and refinement of storm drain, channel, and outfall database

6) Updating and refinement of land use mapping

7) Updating and refinement of land use database

The evaluation of key assumptions will include a review and evaluation of the assumptions of a 10% pollutant reduction for non-structural controls and a 25% reduction in irrigation. If it becomes apparent that either assumption is not supported, the Permittees commit to developing alternative controls.

10.4 Adaptive Management Process Reporting Program

Each adaptive management report will be structured based on the following topical outline:

- Executive Summary
- Assessment of progress toward achieving WQBELs and/or RWLs
- Assessment of progress toward achieving improved water quality in MS4 discharges
- Assessment of progress toward achievement of interim milestones
- Evaluation of water quality priorities
- Assessment of new information for sources other than the CIMP
- Assessment of Regional Water Board Recommendations
- Assessment of recommendations to the WMP from watershed stakeholders and the public
- Modifications to the WMP
- Updates and refinements to storm drain, channel, and outfall database
- Updates and refinements to land use database

The adaptive management report will be incorporated in the Annual Reports due on or before December 15th of the year in which a bi-annual anniversary of WMP approval occurs and as part of the Report of Waste Discharge due July 1, 2017.

Water quality data, information on the development and implementation of source control measures, sediment control, runoff reduction, BMP implementation, and program effectiveness will be gathered and accumulated annually in preparation for reporting on implementation of the adaptive management process every two years and future potential re-evaluation of the Reasonable Assurance Analysis.

11.0 Reporting Program

11.1 Annual Report

The Watershed Group plans to eventually move to an integrated Watershed Annual Report. However, in the near future, annual reports will be submitted by individual Permittees. For now, the Watershed Group will prepare a WMP annual report to be attached to each participating agency's MS4 annual report for submittal to the Regional Water Board Executive Officer in an electronic format on or before December 15th. The WMP annual reports will present a summary of information that will allow the Regional Board to assess the implementation and effectiveness of the Watershed Management Program[1] The CIMP Annual Report will ultimately be attached to the integrated annual report. For now, copies of it will be attached to the individual MS4 annual reports.

The reporting process is intended to meet the following objectives:

- Each Permittee's participation in one or more Watershed Management Programs.
- The impact of each Permittee's stormwater and non-stormwater discharges on the receiving water.
- Compliance with receiving water limitations, numeric water quality-based effluent limitations, and non-stormwater action levels.
- The effectiveness of control measures in reducing discharges of pollutants from the MS4 to receiving waters.
- Whether the quality of MS4 discharges and the health of receiving waters is improving, staying the same, or declining as a result watershed management program efforts, and/or TMDL implementation measures, or other Minimum Control Measures.
- Whether changes in water quality can be attributed to pollutant controls imposed on new development, re-development, or retrofit projects.

Each report will include summaries for each of the following seven sections as required by the MS4 Permit:

1) Stormwater Control Measures – Including estimated cumulative change in percent EIA Since effective date of the Permit; summary of new development/re-development, retrofit, and other projects designed to intercept stormwater runoff constructed during the reporting year, including estimated total runoff volume captured; summary of actions taken to comply with the approved WMP; summary of riparian/wetlands restoration projects; summary of other MCMs as Permittee deems relevant; and status of multi-year projects continuing into subsequent years.

[1] Annual reports will cover the previous July 1st through June 30th time period.

2) Effectiveness Assessment of Stormwater Control Measures – Including summary of rainfall data for the reporting year; hydrographs or flow data for applicable storms; and assessments and comparisons of water quality data, including summaries as to whether or not water quality is improving, staying the same, or declining;
3) Non-Stormwater Control Measures – Including estimates of the number of major outfalls within a Permittee's jurisdiction; number of outfalls screened for significant non-stormwater discharges for reporting year and cumulatively; and attribution of outfalls with confirmed significant non-stormwater discharges
4) Effectiveness Assessment of Non-Stormwater Control Measures – Including summary of the effectiveness of control measures implemented
5) Integrated Monitoring Compliance Report – Including summary of identified exceedances of outfall-based stormwater monitoring data, wet weather receiving water monitoring data, dry weather receiving water data and non-stormwater outfall monitoring data; summary of TIE data, if applicable; and description of efforts taken to mitigate and/or eliminate stormwater and non-stormwater discharges that exceed applicable WQBELs or action levels, if applicable
6) Adaptive Management Strategies – Including summary of effective control measures and of less effective control measures; description of significant changes to control measures anticipated to be made in the next year and a rationale for those changes; a detailed description of control measures to be applied to new development or redevelopment projects disturbing more than 50 acres; and status of all multi-year efforts not completed in the current year that will continue
7) Supporting Data and Information – Include a summary of all monitoring data and associated meta data

The participating agencies will submit annual reports as required by the MS4 Permit. The Regional Board is currently preparing a reporting format. Once available, the reporting form will be incorporated into the WMP as an appendix.

11.2 Watershed Summary Information

The WMP Annual Report will include information specified in Section XVII.B of Attachment E of Order No. R4-2012-0175 and Section XVII.A of Attachment E Order No. R4-2014-0024 in odd year Annual Reports. This information will include information related to:

- Watershed Management Area Information
- Sub-watershed (HUC-12) Description
- Permittees' Drainage Areas within the Watershed

The Watershed Group may reference the WMP in the odd-year report, when the required information is already included or addressed in the WMP, to satisfy baseline information requirements.

11.3 TMDL Reporting

The Watershed Group will report progress of TMDL implementation per schedules in Section XIX of Attachment E of Order No. R4-2012-0175 and Order No. R4-2014-0024. The TMDL reporting that will be addressed is the Los Cerritos Channel Metals TMDLs. Section XIX.F of Attachment E specifies two types of annual reports related to the TMDL:

- Annual Monitoring Reports
- Annual Progress Reports

Both reports are due December 15 annually and will be incorporated into the CIMP Annual Reports required by Section XV of Attachment E.

11.4 Report of Waste Discharge

In accordance with Title 23, Division 3, Chapter 9 of the California Code of Regulations and Title 40, Part 122 of the Code of Federal Regulations, each Discharger shall file a Report of Waste Discharge (ROWD) as application for issuance of new waste discharge requirements no later than 180 days prior to the Order expiration date – December 28, 2017. The Watershed Group proposes to submit the ROWD on behalf of the Permittees within the Watershed on or before July 1, 2017.